ગુજરાત યુનિવર્સિટી

ગુજરાત યુનિવર્સિટીની ઍકેડેમિક કાઉન્સિલની સભા ગુરુવાર તા. ૨૭-૩-૧૯૯૭ના રોજ સવારના ૯-૦૦ કલાકે યુનિવર્સિટી કાર્યાલયમાં મળી હતી. સભાનું પ્રમુખસ્થાન કુલપતિશ્રી પ્રો. એસ. બી. વોરાએ સંભાળ્યું હતું. સભામાં હાજરી નીચે પ્રમાણે હતી :

ક્રમાંક	સભ્યનું નામ	તા. ૨૭-૩-૧૯૯૭
૧.	પ્રો. એસ. બી. વોરા, કુલપતિશ્રી	હાજર
૨.	ડૉ. ચંદ્રકાન્ત એચ. મહેતા, ઉપકુલપતિશ્રી	હાજર
૩.	પ્રો. એન. એમ. પરીખ	ગેરહાજર
૪.	ડૉ. વાય. કે. અગ્રવાલ	હાજર
૫.	પ્રિ. ડી. એમ. શીખ	હાજર
૬.	પ્રિ. બી. એમ. મોદી	હાજર
૭.	પ્રિ. એ. એન. કારિયા	હાજર
૮.	ડૉ. સી. એ. દેસાઈ	ગેરહાજર
૯.	પ્રો. વી. પી. ભારદ્વાજ	હાજર
૧૦.	પ્રો. ધવલ મહેતા	હાજર
૧૧.	પ્રો. યુ. એમ. રાવલ	હાજર
૧૨.	ડૉ. સુમન જી. શાહ	ગેરહાજર
૧૩.	પ્રો. રઘુવીર ચૌધરી	હાજર
૧૪.	પ્રો. કે. એસ. શાસ્ત્રી	ગેરહાજર
૧૫.	પ્રો. એ. આર. શુક્લ	હાજર
૧૬.	પ્રો. એ. આર. શાહ	હાજર
૧૭.	ડૉ. વાય. એસ. શાસ્ત્રી	હાજર
૧૮.	ડૉ. પી. સી. પરીખ	હાજર
૧૯.	શ્રીમતી નીતાબહેન એન. શાહ	હાજર
૨૦.	ડૉ. બી. બી. જાની	હાજર
૨૧.	પ્રિ. સી. પી. જોષી	હાજર
૨૨.	પ્રિ. આર. જી. ભટ્ટ	ગેરહાજર
૨૩.	પ્રિ. કે. જે. પટેલ	હાજર
૨૪.	પ્રિ. આર. એચ. વ્યાસ	હાજર
૨૫.	પ્રો. જે. સી. ત્રિવેદી	ગેરહાજર
૨૬.	પ્રિ. આર. આર. દવે	ગેરહાજર
૨૭.	પ્રિ. એમ. એમ. દેસાઈ	હાજર
૨૮.	ડૉ. કેતન દેસાઈ	ગેરહાજર
૨૯.	ડૉ. એચ. એમ. દેસાઈ	હાજર
૩૦.	શ્રી વાડીભાઈ બી. પટેલ	હાજર
૩૧.	શ્રી શંકરભાઈ આઈ. પટેલ	હાજર.

૧. તા. ૮-૧૨-૧૯૯૬ના રોજ મળેલ ઍકૅડેમિક કાઉન્સિલની સભાની નોંધ મંજૂર કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે તા. ૮-૧૨-૧૯૯૬ના રોજ મળેલ ઍકૅડેમિક કાઉન્સિલની કામકાજની નોંધ મંજૂર કરવામાં આવી તથા તે પર અધ્યક્ષશ્રીએ સહી કરી.

૨. વિજ્ઞાન વિદ્યાભવનના કેમિસ્ટ્રી વિભાગમાં પ્રોફેસર ઑફ કેમિસ્ટ્રીની એક જગ્યા માટે તા. ૨૨-૩-૧૯૯૭નાં રોજ મળેલ વરણી સમિતિની સભાની ભલામણ પરત્વે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે ઉપર્યુક્ત વરણી સમિતિની ભલામણ સ્વીકારવી તથા તદ્અનુસાર પ્રોફેસર ઈન કેમિસ્ટ્રીની જગ્યા પર ડૉ. મેનન શોભના કે. ની પગારધોરણ રૂ. ૪૫૦૦–૧૫૦–૫૭૦૦–૨૦૦–૭૩૦૦માં બે વર્ષના અજમાયશી સમય માટે નિમણૂક કરવા સારુ ઍક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(નોંધ.—વરણી સમિતિની ભલામણ **પરિશિષ્ટ "ક"** તરીકે સામેલ છે.)

૩. વિજ્ઞાન વિદ્યાભવનના કેમિસ્ટ્રી વિભાગમાં રીડર ઇન કેમિસ્ટ્રીની ચાર જગ્યા માટે તા. ૨૨–૩–૧૯૯૭ના રોજ મળેલ વરણી સમિતિની સભાની ભલામણ પરત્વે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે ઉપર્યુક્ત વરણી સમિતિની ભલામણ સ્વીકારવી તથા તદ્અનુસાર રીડર ઇન કેમિસ્ટ્રીની બે બિનઅનામત જગ્યાઓ ઉપર (૧) ડૉ. પ્રદીપ ટી. દેવતા તથા (૨) ડૉ. વિનોદકુમાર જૈનની પગારધોરણ રૂ. ૩૭૦૦–૧૨૫–૪૯૫૦–૧૫૦–૫૭૦૦માં બે વર્ષના અજમાયશી સમય માટે નિમણૂક કરવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

વધુમાં એમ પણ ઠરાવવામાં આવ્યું કે અનુસૂચિત જાતિની એક અનામત જગ્યા માટે જાહેરખબર આપવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(નોંધ.—વરણી સમિતિની ભલામણ **પરિશિષ્ટ "ખ"** તરીકે સામેલ છે.)

૪. વિજ્ઞાન વિદ્યાભવનના કેમિસ્ટ્રી વિભાગમાં લેક્ચરર ઇન કેમિસ્ટ્રીની પાંચ જગ્યા માટે તા. ૨૨–૩–૧૯૯૭ના રોજ મળેલ વરણી સમિતિની સભાની ભલામણ પરત્વે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે ઉપર્યુક્ત વરણી સમિતિની ભલામણ સ્વીકારવી તથા તદ્અનુસાર લેક્ચરર ઇન કેમિસ્ટ્રીની બે બિનઅનામત જગ્યાઓ ઉપર ડૉ. ચારુલત્તા વ્યાસ તથા ડૉ. પદમાવતી દેવરકોંડા અન્નપૂર્ણાની બે વર્ષના અજમાયશી સમય માટે પગારધોરણ રૂ. ૨૨૦૦–૭૫–૨૮૦૦–૧૦૦–૪૦૦૦માં નિમણૂક કરવા સારુ તથા વધુમાં એમ પણ ઠરાવવામાં આવ્યું કે અનુસૂચિત જનજાતિની બે અનામત જગ્યાઓ તથા અનુસૂચિત જાતિની એક અનામત જગ્યા માટે પુન: જાહેરખબર આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(નોંધ.—વરણી સમિતિની ભલામણ **પરિશિષ્ટ "ગ"** તરીકે સામેલ છે.)

૫. સમાજવિદ્યા ભવનમાં લેક્ચરર ઇન લેબર વેલફેરની એક જગ્યા માટે તા. ૨૩–૩–૧૯૯૭ના રોજ મળેલ વરણી સમિતિની સભાની ભલામણ પરત્વે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે ઉપર્યુક્ત વરણી સમિતિની ભલામણ સ્વીકારવી તથા તદ્અનુસાર લેક્ચરર ઇન લેબર વેલફેરની એક જગ્યા ઉપર શ્રી ગીતા લાલની પગારધોરણ રૂ. ૨૨૦૦–૭૫–૨૮૦૦–૧૦૦–૪૦૦૦માં બે વર્ષના અજમાયશી સમય માટે નિમણૂક કરવા તથા પ્રતિક્ષા યાદી ઉપર ડૉ. સુજાતા સોની ઓનાટ્ટુનું નામ રાખવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(નોંધ.—વરણીસમિતિની ભલામણ **પરિશિષ્ટ "ઘ"** તરીકે સામેલ છે.)

૬. ભાષા-સાહિત્ય ભવનમાં લેક્ચરર ઇન ઇંગ્લિશની એક જગ્યા માટે તા. ૨૩–૩–૧૯૯૭ના રોજ મળેલ વરણી સમિતિની સભાની ભલામણ પરત્વે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે ઉપર્યુક્ત વરણી સમિતિની ભલામણ સ્વીકારવી તથા તદ્અનુસાર લેક્ચરર ઇન અંગ્રેજીની એક જગ્યા ઉપર શ્રી દર્શના ત્રિવેદીની બે વર્ષનાં અજમાયશી સમય માટે પગારધોરણ રૂ. ૨૨૦૦–૭૫–૨૮૦૦–૧૦૦–૪૦૦૦માં નિમણૂક કરવા તથા પ્રતિક્ષા યાદી ઉપર શ્રી સ્વાતિ કાપડિયાનું નામ રાખવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(નોંધ.—વરણી સમિતિની ભલામણ **પરિશિષ્ટ "ચ"** તરીકે સામેલ છે.)

૭. કૉમર્સ ભવનમાં લેક્ચરર ઇન કૉમર્સની બે જગ્યાઓ માટે તા. ૨૩–૩–૧૯૯૭ના રોજ મળેલ વરણી સમિતિની સભાની ભલામણ પરત્વે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદ્અનુસાર લેક્ચરર ઇન કૉમર્સની એક બિનઅનામત જગ્યા ઉપર શ્રી પંડ્યા હેમલ ભરતની બે વર્ષના અજમાયશી સમય માટે પગારધોરણ રૂ. ૨૨૦૦–૭૫–૨૮૦૦–૧૦૦– ૪૦૦૦માં નિમણૂક કરવા તથા પ્રતિક્ષા યાદી ઉપર શ્રી ત્રિવેદી ચિરાગ જે. નું નામ રાખવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

વધુમાં ઠરાવવામાં આવ્યું કે અનુસૂચિત જનજાતિની એક અનામત જગ્યા માટે પુન: જાહેરખબર આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(નોંધ.—વરણી સમિતિની ભલામણ **પરિશિષ્ટ "છ"** તરીકે સામેલ છે.)

૮. ત્યાર બાદ પ્રમુખશ્રીની પરવાનગીથી નીચેની બાબતો રજૂ કરવામાં આવી :

૮(૧). માસ્ટર ઑફ ફિલોસોફી (એમ.ફિલ.)ની પદવી એનાયત કરવા અંગે એમ.ફિલ.ની થિયરીની પરીક્ષા તેમજ ડેઝર્ટેશન (નિબંધ)ના સમન્વય અંગે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે એમ.ફિલ.ના પ્રવર્તમાન નિયમોના સંદર્ભમાં ડેઝર્ટેશન (નિબંધ) આપે તે પછી જ થિયરીની પરીક્ષા માટે વિદ્યાર્થી અધિકૃત બને તે રીતે નિયમોના ફેરફાર અંગેની શક્યતા તપાસીને ઘટિત કાર્યવાહી કરવાની સત્તા કુલપતિશ્રીને આપવી.

૮(૨). યુનિવર્સિટીની સંલગ્ન કૉલેજો તરફથી બી.બી.એ. ડિગ્રી કોર્ષ શરૂ કરવા અંગેનું જોડાણ માટે આવેલ અરજીઓ પરત્વે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે સદરહુ બાબતોના તમામ પાસાઓનો સર્વાંગી અભ્યાસ કરીને ઘટિત નિર્ણય લઈ કાર્યવાહી કરવાની સત્તા કુલપતિશ્રીને આપવી.

ત્યાર બાદ સભાનું કામકાજ પૂરું થયું હતું.

નં. ઍકે. કાઉ/૭૯૬૬/૧૯૯૭
ગુજરાત યુનિવર્સિટી કાર્યાલય,
અમદાવાદ-૯. તા. ૨૦-૫-૧૯૯૭

એમ. પી. જડિયા
કુલસચિવ

પરિશિષ્ટ "ક"

કામકાજ ક્રમાંક ૨

Confidential

A metting of the Selection Committee for recommending name for appointment to the One Post (Open) of Professor in Chemistry in the University School of Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 22nd March, 1997 at 9-00 a.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor
2. Prof. C. H. Mehta, Pro-Vice-Chancellor
3. Prof. A. C. Shah, Expert
4. Prof. S. M. Khopkar, Expert
5. Prof. H. M. Chawla, Expert
6. Prof. Y. K. Agrawal, Invitee.

The following candidates were called for interview :

1. Vora Chandravadan R.	Present
2. Menon Sobhana K.	Present
3. Chudasama Uma V.	Absent.

After interviewing the candidates who were present and considering their relative merits, the Committee recommends her for appointment thereto :

Menon Sobhana K.

Prof. S. B. Vora
(Vice-Chancellor)
Prof. C. H. Mehta
(Pro-Vice-Chancellor)
Prof. A. C. Shah
Prof. S. M. Khopkar
Prof. H. M. Chawla
Prof. Y. K. Agrawal

પરિશિષ્ટ "ખ"

કામકાજ ક્રમાંક ૩

Confidential

A metting of the Selection Committee for recommending names for appointment to the Four Posts of Reader in Chemistry (One post is researved for S.C. candidate, and the other one post is reserved for corrosion and the two posts are open) in the University School of Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 22nd March, 1997 at 10-00 a.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee member was as under :

1. Prof. S. B. Vora, Vice-Chancellor
2. Prof. C. H. Mehta, Pro-Vice-Chancellor
3. Prof. H. M. Chawla, Expert
4. Prof. S. M. Khopkar, Expert
5. Prof. A. C. Shah, Expert
6. Prof. Y. K. Agrawal, Invitee.

The following candidates were called for interview :

1. Basin Chandra P.	Present
2. Shah Sanjaykumar S.	Present
3. Amin Sushila S.	Present
4. Deota Pradeep T.	Present
5. Parikh Kalpesh S.	Absent
6. Jain Vinodkumar	Present
7. Gandhi Anilkumar H.	Present
8. Harsh Sunita	Present

After interviewing the candidates who were present and considering their relative merits, the Committee recommends for appointment thereto :

1. Dr. Pradip Devota
2. Dr. V. K. Jain

Only two names recommended, the remaining post to be re-advertised.

No S.C. candidate had appeared so post to be readvertised.

Prof. S. B. Vora
(Vice-Chancellor)
Prof. C. H. Mehta
(Pro-Vice-Chancellor)
Prof. H. M. Chawla
Prof. S. M. Khopkar
Prof. A. C. Shah

પરિશિષ્ટ "ગ"

કામકાજ ક્રમાંક ૪

Confidential

A metting of the Selection Committee for recommending names for appointment to the Five Posts of Lecturer in Chemistry (One post is researved for S.C. candidate, two posts for S.T. candidates and the other two posts are open) in the University School of Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 22nd March, 1997 at 12-30 p.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee member was as under :

1. Prof. S. B. Vora, Vice-Chancellor
2. Prof. C. H. Mehta, Pro-Vice-Chancellor
3. Prof. H. M. Chawla, Expert
4. Prof. S. M. Khopkar, Expert
5. Prof. A. C. Shah, Expert
6. Prof. Y. K. Agrawal, Invitee.

The following candidates were called for interview :

1.	Dave Hiteshkumar B.	Absent
2.	Lali Varghese	Present
3.	Prajapati Sengita B.	Absent
4.	Khare Ravi	Absent
5.	Tripathi Praveenkumar	Absent
6.	Patel Angit G.	Absent
7.	Sharma Anjali	Present
8.	Maisuria Mukesh M.	Present
9.	R. Sripriya	Absent
10.	Suthar Bhavna R.	Present
11.	Barad Yogendrasinh H.	Present
12.	Srivastav Charulata	Absent
13.	Parikh Bharatkumar M.	Present
14.	Sheladiya Bharat D.	Absent
15.	Soni Anilkumar J.	Absent
16.	Mehta Tushar B.	Present
17.	Shah Sanjaykumar S.	Absent
18.	Shah Alpekkumar R.	Present
19.	Parikh Kalpesh S.	Present
20.	Patel Chetan H.	Present
21.	Harjinder Kaur	Absent
22.	R. Valarivan	Present
23.	Borad Mukeshkumar J.	Present
24.	Patel Dineshchandra K.	Present
25.	Patel Chiragkumar A.	Present
26.	Shjarma Anu R.	Absent
27.	Dave Pragnesh N.	Present
28.	Vyas Dipeshkumar V.	Present
29.	Solanki Manojkumar R.	Absent
30.	Menon Deepa K.	Absent
31.	Patel Bipinkumar B.	Present
32.	Rajwanshi Poonam	Present
33.	Patel Vikramkumar D.	Absent
34.	Patel Riteshkumar B.	Absent
35.	Raval Jiten M.	Absent
36.	Rana Hemangini B.	Present
37.	Shobha Choudhary	Present
38.	Dahal Sanjay	Present
39.	Shah Nimesh P.	Present
40.	Devarakonda Annapurna P.	Present
41.	Srivastava Reeta	Present
42.	Dhanani Jignesh B.	Present
43.	Parmar Nilesh L.	Present

44.	Vikal Kavita	Present
45.	Sarkar Joy	Absent
46.	Samnani Prakash B.	Present
47.	Jethani Asha T.	Present
48.	Dalal Mahesh K.	Present
49.	Parmar Kokilaben A.	Present
50.	Amin Sushila B,	Present
51.	Manjula Rani	Present
52.	Sharma Sangita	Absent
53.	Vallabhanani Sree L.	Absent
54.	Shah Amnishkumar M.	Absent
55.	Shah Hemantkumar A.	Absent
56.	Vyas Jigneshkumar J.	Present
57.	Gorgamwala Vijay S.	Present
58.	Vaghela Manishkumar R.	Absent
59.	Raj Mahendrakumar M.	Present
60.	Yadava Madhuri	Present
61.	Solanki Dipakkumar M.	Present
62.	Rajyaguru Shivani A.	Present
63.	Hirani Tarulata B.	Absent
64.	Sita Singh	Absent
65.	Chauhan Dhirajlal D.	Absent
66.	Baraiya Hiteshkumar S.	Absent
67.	Vyas Charulata V.	Present
68.	Gamit Ashvinkumar N.	Absent
69.	Jakhaniya Vasudev B.	Present
70.	Singh Surendra P.	Absent
71.	Solanki Viththalbhai M.	Present
72.	Patel Dineshkumar M.	Present
73.	Baldaniya Bharatbhai B.	Present
74.	Shah Denish H.	Absent
75.	Patel Jashavantkumar K.	Present
76.	Panchal Dasharathkumar K.	Present
77.	Patel Rajeshkumar T.	Present
78.	Patel Charulataben L.	Absent
79.	Vijayvargiy Manoj R.	Present
80.	Dabhi Yogeshkumar M.	Present
81.	Makwana Narendra G.	Absent
82.	Srivastava Neena	Present
83.	Banik Pompa D.	Absent
84.	Baushar Kavita U.	Present
85.	Patel Jitendra H.	Absent
86.	Patel Hitendra C.	Present
87.	Dasadia Kumar N.	Present
88.	Guru Anuradha	Present
89.	Patel Babubhai M.	Present
90.	Harsh Sunita	Present

After interviewing the candidates who were present and considering their relative merits, the Committee recommends as under :

No candidate for S.T. Category Appeared for interview.

S.C. candidate not selected because they could not answer basic Question asked for school/graduate level. Post to be readvertised :

For open category following candidates selected in order of preference.

1. Dr. Charulata Vyas 2. Dr. Deverkonda Annapurna 3. Shushila B. Amin.

Prof. S. B. Vora
(Vice-Chancellor)
Prof. C. H. Mehta
(Pro-Vice-Chancellor)
Prof. H. M. Chawla
Prof. S. M. Khopkar
Prof. A. C. Shah

પરિશિષ્ટ "ઘ"

કામકાજ ક્રમાંક ૫

Confidential

A metting of the Selection Committee for recommending name for appointment to the one Posts of Lecturer in Labour Welfare (Open candidate) in the University School of Social Sciences, Gujarat University, Ahmedabad-380 009 was held on Sunday the 23rd March, 1997 at 4-00 p.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee member was as under :

1. Prof. S. B. Vora, Vice-Chancellor
2. Prof. C. H. Mehta, Pro-Vice-Chancellor
3. Prof. Narayan Sheth, Expert
4. Prof. Varsha Anjaria, Expert.
5. Prof. V. P. Bhardwaj, Invitee.

The following candidates were called for interview :

1.	Patel Piyush A.	Present
2.	Jadeja Mayursinh J.	Present
3.	Lal Geeta K.	Present
4.	Gandhi Pushpa L.	Present
5.	Shukla Mimansa D.	Present
6.	Karia Bhavesh H.	Present
7.	Pande Manoj S.	Absent
8.	Raval Kinnari D.	Present
9.	Patel Narendranath K.	Absent
10.	Raval Gargi N.	Present
11.	Rajgor Shaileshkumar R.	Absent
12.	Patel Sanjay I.	Absent
13.	Onattu Sujatha S.	Present
14.	Thakore Digvijaysinh G.	Present
15.	Safi Ketankumar G.	Present
16.	Shah Mita S.	Present
17.	Bhatia Dipakkumar R.	Present
18.	Arya Anita O.	Present
19.	Mehta Mahendra D.	Absent

After interviewing the candidates who were present and considering their relative merits, the Committee recommends as under In order of preference :

1. Mr. Gita Lal
2. Mr. Onattu Sujatha S.

Prof. S. B. Vora
(Vice-Chancellor)
Prof. C. H. Mehta
(Pro-Vice-Chancellor)
Prof. Narayan Sheth
Prof. Varsha Anjaria

પરિશિષ્ટ "ચ"

કામકાજ ક્રમાંક ૬

Confidential

A metting of the Selection Committee for recommending names for appointment to the Post of Lecturer in English in the University School of Languages, Gujarat University, Ahmedabad-380 009 was held on Sunday the 23rd March, 1997 at 1-30 p.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee member was as under :

1. Prof. S. B. Vora, Vice-Chancellor
2. Prof. C. H. Mehta, Pro-Vice-Chancellor
3. Prof. I. H. Pandya, Expert
4. Prof. P. K. Mehta, Expert.
5. Prof. R. A. Malagi, Invitee.

The following candidates were called for interview :

1.	Balaji Ranganathan	Present
2.	Macwan Sanjaykumar J.	Absent
3.	Naik Vihang A.	Present
4.	Mukherjee Sanjay	Present
5.	Sinha Anita	Present
6.	Parmar Hitesh V.	Absent
7.	Dave Mihir M.	Absent
8.	Nanavati Devang S.	Present
9.	Damor Nutan B.	Present
10.	Kapadia Swati S.	Present
11.	Khushu - Lahiri Rajyashree	Present
12.	Peethala Sushma	Present
13.	Baxi Sonal	Present
14.	Shukla Anant R.	Absent
15.	Rajsekhar Raji	Present
16.	Trivedi Darshana G.	Present
17.	Mokashi Punekar Rohini	Present
18.	Joshi Jagdishkumar S.	Absent
19.	Mandavia Seema K.	Absent
20.	Arora Vandana R.	Present
21.	Gupta Neerja A.	Present
22.	Nityanandam Indira	Present
23.	[illegible]shankar V. Bharathi	Present
24.	Chakrabarti Tapas	Present

[illegible] interviewing the candidates who were present and considering their relative merits, [illegible] recommends as under in order of preference :

1. Ms. Darshana Trivedi
2. Ms. Swati Kapadia

Prof. S. B. Vora
(Vice-Chancellor)
Prof. C. H. Mehta
(Pro-Vice-Chancellor)
Prof. I. H. Pandya
Prof. P. K. Mehta

પરિશિષ્ટ "છ"

કામકાજ ક્રમાંક ૭

Confidential

A metting of the Selection Committee for recommending names for appointment to the two Posts of Lecturer in Commerce (One post is reserved for S.T. candidate and other post is Open) in the University School of Commerce, Gujarat University, Ahmedabad-380 009 was held on Sunday the 23rd March, 1997 at 9-30 a.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee member was as under :

1. Prof. S. B. Vora, Vice-Chancellor
2. Prof. C. H. Mehta, Pro-Vice-Chancellor
3. Prof. M. N. Vora, Expert
4. Prof. T. Madhvan, Expert.
5. Prof. B. H. Desai, Invitee.

The following candidates were called for interview :

1.	Pandya Hemal Bharat	Present
2.	Dhandhukiya Dipak Hasmukhray	Absent
3.	Patel Shaileshkumar Parashotamdas	Present
4.	Trivedi Chirag Jitendrabhai	Present
5.	Vyas Viralkumar Umiyashankar	Present
6.	Patel Veena Raojibhai	Present
7.	Hariramani Seema Gopichand	Absent
8.	Patel Jayeshkumar Babubhai	Absent
9.	Parghi Prakashkumar Bhursing	Absent
10.	Bukhari Vahedjalal Babarali	Present
11.	Mehta Anand Dinesh	Present
12.	Chudasama Dilipsinh Natubha	Present
13.	Sharma Manisha	Absent
14.	Pathan Raziyabanu Abdullatif	Absent
15.	Pandya Jayaraj Krishnakant	Absent
16.	Thakkar Pravinkumar Natvarlal	Present
17.	Iyer Priya Vaidyanathan	Present
18.	Somani Minaxi Bharat	Absent
19.	Gohil Anilkumar Amrutlal	Present
20.	Brahmbhatt Jayprakash Shankarlal	Present
21.	Muchhal Mamta	Present
22.	Juthani Swati N.	Present
23.	Makwana Kamlaben Devjibhai	Present
24.	Patel Saileshkumar Dashrathlal	Absent

After interviewing the candidates who were present and considering their relative merits, the Committee recommends following as under :

No. S.T. candidate appeared for interview so committee recommend to re-advertise the post.

For open category the committee recommend the following in under to preference.

1. Pandya Hemal Bharat
2. Trivedi Chirag Jitendrabhai.

Prof. S. B. Vora
Vice-Chancellor
Prof. C. H. Mehta
Pro-Vice-Chancellor
Prof. M. N. Vora
Prof. T. Madhvam

Gujarat University Press, Ahmedabad-380 009

ગુજરાત યુનિવર્સિટી

ગુજરાત યુનિવર્સિટીની ઍકેડેમિક કાઉન્સિલની સભા રવિવાર, તા. ૫-૧૦-૧૯૯૭ના રોજ બપોરના ૧૧-૩૦ વાગ્યે યુનિવર્સિટી કાર્યાલયમાં મળી હતી. સભાનું પ્રમુખસ્થાન કુલપતિશ્રી એસ. બી. વોરાએ સંભાળ્યું હતું. સભામાં હાજરી નીચે પ્રમાણે હતી :

ક્રમાંક	સભ્યનું નામ	તા. ૫-૧૦-૧૯૯૭
૧.	પ્રો. એસ. બી. વોરા, કુલપતિશ્રી	હાજર
૨.	પ્રો. કે. એસ. શાસ્ત્રી, ઉપકુલપતિશ્રી	હાજર
૩.	પ્રો. એન. એમ. પરીખ	ગેરહાજર
૪.	ડૉ. વાય. કે. અગ્રવાલ	હાજર
૫.	પ્રિ. ડી. એમ. શીખ	હાજર
૬.	પ્રિ. બી. એમ. મોદી	હાજર
૭.	પ્રિ. એ. એન. કારિયા	હાજર
૮.	ડૉ. સી. એ. દેસાઈ	હાજર
૯.	પ્રો. વી. પી. ભારદ્વાજ	હાજર
૧૦.	પ્રો. વાય. ડી. વ્યાસ	હાજર
૧૧.	પ્રો. આર. ડી. મુળીયા	હાજર
૧૨.	પ્રો. યુ. એમ. રાવલ	હાજર
૧૩.	ડૉ. એસ. આર. દવે	ગેરહાજર
૧૪.	ડૉ. સુમન જી. શાહ	હાજર
૧૫.	પ્રો. રઘુવીર ચૌધરી	હાજર
૧૬.	પ્રો. વી. બી. પાઠક	હાજર
૧૭.	પ્રો. એ. આર. શુક્લ	હાજર
૧૮.	પ્રો. એ. આર. શાહ	હાજર
૧૯.	ડૉ. વાય. એસ. શાસ્ત્રી	હાજર
૨૦.	શ્રીમતી નીતાબહેન એન. શાહ	હાજર
૨૧.	ડૉ. બી. બી. જાની	હાજર
૨૨.	પ્રિ. સી. પી. જોષી	હાજર
૨૩.	પ્રિ. આર. જી. ભટ્ટ	હાજર
૨૪.	પ્રિ. કે. જે. પટેલ	હાજર
૨૫.	પ્રિ. આર. એચ. વ્યાસ	હાજર
૨૬.	પ્રો. જે. સી. ત્રિવેદી	ગેરહાજર
૨૭.	પ્રિ. એમ. એમ. દેસાઈ	ગેરહાજર
૨૮.	ડૉ. કેતન દેસાઈ	ગેરહાજર
૨૯.	ડૉ. એચ. એમ. દેસાઈ	ગેરહાજર
૩૦.	ડૉ. આર. પી. મહેતા	હાજર
૩૧.	શ્રી લાડીભાઈ બી. પટેલ	હાજર
૩૨.	શ્રી શંકરભાઈ આઈ. પટેલ	હાજર

૧. તા. ૨૭-૩-૧૯૯૭ના રોજ મળેલ એકેડેમિક કાઉન્સિલની સભાની નોંધ મંજૂર કરવા બાબત.

તા. ૨૭-૩-૧૯૯૭ના રોજ મળેલી એકેડેમિક કાઉન્સિલની સભાની નોંધ મંજૂર કરવામાં આવી તથા તે પર પ્રમુખશ્રીએ સહી કરી.

૨. કુલપતિશ્રીનાં મંજૂર કરેલાં નીચેનાં કાર્યો (જાણ સારૂ) :

૨ (૧). ગણિતશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા. ૧૩-૧૨-૧૯૯૬ની સભાએ ફર્સ્ટ બી.એ./બી.એસસી.નો ગણિતશાસ્ત્ર વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૬થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને યુનિવર્સિટી સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—ફર્સ્ટ બી.એ./બી.એસસી. ગણિતશાસ્ત્રનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૧" તરીકે સામેલ છે.)

૨ (૨). ઍકાઉન્ટન્સી વિષયની અભ્યાસ સમિતિની તા. ૧૫-૪-૧૯૯૭ની સભાએ સેકન્ડ બી.કૉમ.નો ઍકાઉન્ટન્સી અને ટેક્સેશન વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—સેકન્ડ બી.કૉમ.નો ઍકાઉન્ટન્સી તેમજ ટેક્સેશન વિષયનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૨" તરીકે સામેલ છે.)

૨ (૩). ભૌતિક વિજ્ઞાન વિષયની અભ્યાસ સમિતિની તા. ૨૫-૩-૧૯૯૭ની સભાએ સેકન્ડ બી.એસસી.નો ભૌતિક વિજ્ઞાન વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—સેકન્ડ બી.એસસી. ભૌતિક વિજ્ઞાન વિષયનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૩" તરીકે સામેલ છે.)

૨ (૪). ઝુલોજી વિષયની અભ્યાસ સમિતિની તા. ૧૯/૨૦/૨૧-૯-૧૯૯૬ની સભાએ સેકન્ડ બી.એસસી. અને થર્ડ બી.એસસી.નો ઝુલોજી વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી ક્રમશ: અમલી બનાવવા કરેલ ભલામણ સ્વીકારીને સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—સેકન્ડ બી.એસસી. અને થર્ડ બી.એસસી.નો ઝુલોજી વિષયનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૪" તરીકે સામેલ છે.)

૨ (૫). ગણિતશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા. ૨૫-૪-૧૯૯૭ની સભાએ સેકન્ડ બી.એ./સેકન્ડ બી.એસસી.નો ગણિતશાસ્ત્ર વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને સંલગ્ન કોલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—સેકન્ડ બી.એ./બી.એસસી.નો ગણિતશાસ્ત્રનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૫" તરીકે સામેલ છે.)

૨ (૬). પ્રાણીશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા. ૨૦-૨-૧૯૯૭ની સભાએ એમ.એસસી.-ભાગ ૧ અને ૨નો પ્રાણીશાસ્ત્ર (ઝુલોજી)નો અભ્યાસક્રમ જૂન, ૧૯૯૭થી ક્રમશ: અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને યુનિવર્સિટી ભવનોમાં તથા સંલગ્ન કૉલેજો અને માન્ય પી.જી. કેન્દ્રોને પરિપત્રિત કર્યાનું;

(નોંધ.—એમ.એસસી. ભાગ ૧ અને ૨ ઝુલોજી વિષયનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૬" તરીકે સામેલ છે.)

૨ (૭). અર્થશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા. ૨૬/૨૭-૨-૧૯૯૭ની સભાએ સેકન્ડ બી.એ./સેકન્ડ બી.કૉમ.નો અર્થશાસ્ત્ર વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—સેકન્ડ બી.એ./સેકન્ડ બી.કૉમ. પરીક્ષાના અર્થશાસ્ત્ર વિષયનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૭" તરીકે સામેલ છે.)

૨ (૮). માઇક્રોબાયોલોજી વિષયની અભ્યાસ સમિતિની તા. ૧૧-૩-૧૯૯૭ની સભાએ સેકન્ડ બી.એસસી.નો માઇક્રોબાયોલોજી વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—સેકન્ડ બી.એસસી.નો માઇક્રોબાયોલોજી વિષયનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૮" તરીકે સામેલ છે.)

૨ (૯). રસાયણવિજ્ઞાન વિષયની અભ્યાસ સમિતિની તા. ૭-૫-૧૯૯૭ની સભાએ સેકન્ડ બી.એસસી.નો રસાયણવિજ્ઞાન વિષયનો અભ્યાસક્રમ તથા ફર્સ્ટ બી.એસસી.ના પ્રેક્ટિકલની સમયમર્યાદા અંગે જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;
(નોંધ.—સેકન્ડ બી.એસસી.નો સુધારેલો અભ્યાસક્રમ તથા ફર્સ્ટ બી.એસસી.ના પ્રેક્ટિકલના સમયમર્યાદા અંગેનો પરિપત્ર **પરિશિષ્ટ** "૯" તરીકે સામેલ છે.)

૨ (૧૦) ભૌતિકવિજ્ઞાન વિષયની અભ્યાસસમિતિની તા. ૨૫-૩-૧૯૯૭ની સભાએ ફર્સ્ટ બી.એસસી.ના ભૌતિકવિજ્ઞાન વિષયના સુધારેલા અભ્યાસક્રમમાં કેટલાક સુધારા સૂચવી જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને તથા સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—ફર્સ્ટ બી.એસસી. ભૌતિકવિજ્ઞાનના સુધારાઓ **પરિશિષ્ટ** "૧૦" તરીકે સામેલ છે.)

૨ (૧૧). બોટાની વિષયની અભ્યાસસમિતિની તા. ૬-૩-૧૯૯૭, તા. ૨૦-૫-૧૯૯૭ અને તા. ૨૭-૫-૧૯૯૭ની સભામાં સેકન્ડ બી.એસસી.નો બોટાની વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—સેકન્ડ બી.એસસી. બોટાની વિષયનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૧૧" તરીકે સામેલ છે.)

૨ (૧૨). કૉમ્પ્યુટર સાયન્સ વિષયની એડહોક સમિતિની તા. ૭-૫-૧૯૯૭ની સભાએ ફર્સ્ટ બી.એસસી.નો કૉમ્પ્યુટર સાયન્સ વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—ફર્સ્ટ બી.એસસી. કૉમ્પ્યુટર સાયન્સનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૧૨" તરીકે સામેલ છે.)

૨ (૧૩). કાયદાની વિદ્યાશાખાની તા. ૧૮-૬-૧૯૯૭ની સભાએ ફર્સ્ટ એલએલ.બી., સેકન્ડ એલએલ.બી. અને થર્ડ એલએલ.બી.નો નવો અભ્યાસક્રમ જૂન, ૧૯૯૭થી ક્રમશ: અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને યુનિવર્સિટી ભવનો તથા સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—ફર્સ્ટ, સેકન્ડ અને થર્ડ એલએલ.બી.નો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૧૩" તરીકે સામેલ છે.)

૨ (૧૪). રાજ્યશાસ્ત્ર વિષયની અભ્યાસસમિતિની તા. ૫-૪-૧૯૯૭ની સભાએ એમ.એ. ભાગ ૧-૨નો રાજ્યશાસ્ત્ર વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને યુનિવર્સિટી ભવનો તથા અનુસ્નાતક કેન્દ્રોને પરિપત્રિત કર્યાનું;

(નોંધ.—એમ.એ. ભાગ ૧-૨ રાજ્યશાસ્ત્રનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૧૪" તરીકે સામેલ છે.)

૨ (૧૫). ઇલેક્ટ્રોનિક્સ સાયન્સ વિષયની એડહોક સમિતિની તા. ૭-૫-૧૯૯૭ની સભાએ સેકન્ડ બી.એસસી.નો ઇલેક્ટ્રોનિક્સ સાયન્સ વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને યુનિવર્સિટી ભવનો તથા સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—સેકન્ડ બી.એસસી.નો ઇલેક્ટ્રોનિક્સ સાયન્સ વિષયનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૧૫" તરીકે સામેલ છે.)

૨ (૧૬). શિક્ષણ વિદ્યાશાખાના બી.એડ. પરીક્ષાના પેપર-૪ અને પેપર-૫માં એલિમેન્ટ ઑફ બુક કીપિંગને બદલે એલિમેન્ટ્સ ઑફ ઍકાઉન્ટન્સી નામ સુધારી જૂન, ૧૯૯૭થી અમલીકરણ અંગે પરિપત્રિત કર્યાનું;

૨ (૧૭). ઇલેક્ટ્રોનિક્સ વિષયની એડહોક સમિતિની તા. ૨૦-૬-૧૯૯૭ની સભાએ એમ.એસસી. પાર્ટ-૨નો ઇલેક્ટ્રોનિક્સ વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને યુનિવર્સિટી ભવનો તથા સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—એમ.એસસી. પાર્ટ-૨નો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૧૬" તરીકે સામેલ છે.)

૨ (૧૮). એમ.સી.એ./ડી.સી.એ. એડહોક સમિતિની તા. ૧-૪-૧૯૯૭ની સભાએ ડી.સી.એ./એમ.સી.એ.નો સુધારેલો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—ડી.સી.એ./એમ.સી.એ.નો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૧૭" તરીકે સામેલ છે.)

૨ (૧૯). જીઓલોજી વિષયની એડહોક સમિતિની તા. ૩૦-૫-૧૯૯૭ની સભાએ એમ.એસસી. ભાગ-૨નો જીઓલોજી વિષયનો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને યુનિવર્સિટી ભવનો તથા સંલગ્ન કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—એમ.એસસી. ભાગ-૨નો જીઓલોજી વિષયનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ** "૧૮" તરીકે સામેલ છે.)

૨ (૨૦). ૧૯૯૭-૯૮ના વર્ષ માટે બિઝનેસ મૅનેજમેન્ટની અભ્યાસસમિતિએ તેની તા. ૧૧-૮-૧૯૯૭ની સભામાં થર્ડ બી.કૉમ. પરીક્ષાના બિઝનેસ મૅનેજમેન્ટ વિષય પેપર-૫ના ડિઝર્ટેશનના મુદ્દાઓ નિયત કરી સંલગ્ન વાણિજ્ય કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.—બિઝનેસ મૅનેજમેન્ટ વિષયના પેપર-૫ના ડિઝર્ટેશનના મુદ્દાઓ **પરિશિષ્ટ** "૧૯" તરીકે સામેલ છે.)

૨ (૨૧). પોસ્ટ-ગ્રેજ્યુએટ ડિપ્લોમા ઇન ઇન્વેસ્ટમેન્ટ એન્ડ ફાઈનાન્સિયલ એનાલિસિસની એડહોક સમિતિની તા. ૨૯-૫-૧૯૯૭ની સભાએ પી.જી. ડિપ્લોમા ઇન ઇન્વેસ્ટમેન્ટ એન્ડ ફાઈનાન્સિયલ એનાલિસિસનો સુધારેલો અભ્યાસક્રમ જૂન, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકારીને યુનિવર્સિટી ભવનને પરિપત્રિત કર્યાનું;

(નોંધ.-પી.જી. ડિપ્લોમા ઇન આઈ.એફ.એ.નો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ "૨૦"** તરીકે સામેલ છે.)

૨ (૨૨). વિનયન વિદ્યાશાખામાં ફરજિયાત અંગ્રેજીનો જે અભ્યાસક્રમ અમલમાં છે તે જ અભ્યાસક્રમ નાટ્ય વિદ્યાશાખા માટે મંજૂર રાખ્યાનું;

૨ (૨૩). વિજ્ઞાન વિદ્યાશાખાના જુદા જુદા વિષયોમાં ૧૯૯૬-૯૭ના વર્ષ દરમિયાન જે વિષયોના અભ્યાસક્રમો સુધારવામાં આવ્યા છે તેના પ્રેક્ટિકલ (પ્રાયોગિક કાર્ય) અભ્યાસક્રમની સમયમર્યાદામાં સુધારા કરેલ હોય તે સુધારા હાલ મોકૂફ રાખવાની ભલામણ પરિપત્રિત કર્યાનું;

૨ (૨૪). યુનિવર્સિટીના ઑર્ડિ. ૭૫ અન્વયે જુદી જુદી વિદ્યાશાખાના સને ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષ માટેના સત્રોમાં કરેલ ફેરફાર મંજૂર કરી પરિપત્રિત કર્યાનું;

(નોંધ.-વિવિધ વિદ્યાશાખાના સત્રો મંજૂર કર્યાના પરિપત્રોની નકલ **પરિશિષ્ટ "૨૧"** તરીકે સામેલ છે.)

૨ (૨૫) ફાર્મસી વિદ્યાશાખાના સને ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષ માટેનાં સત્રોની વ્યવસ્થા મંજૂર કરી પરિપત્રિત કર્યાનું;

(નોંધ.-ફાર્મસી વિદ્યાશાખાના સત્રોની પરિપત્રોની નકલ **પરિશિષ્ટ "૨૨"** તરીકે સામેલ છે.)

૨ (૨૬) બી.એડ. પ્રવેશ અંગેની સને ૧૯૯૭-૯૮ના વર્ષ માટેની સંલગ્ન બી.એડ. કૉલેજોના આચાર્યશ્રીઓની તા. ૨૧-૧૨-૧૯૯૬ના રોજ મળેલ સભાની નોંધ મંજૂર કર્યાનું;

(નોંધ.-તા. ૨૧-૧૨-૧૯૯૬ની સભાની નોંધ **પરિશિષ્ટ "૨૩"** તરીકે સામેલ છે.)

૨ (૨૭) નીચેની કૉલેજોએ જોડાણ મેળવવા માટેની જોડાણઅરજી પરત્વે નિયુક્ત કરેલ સ્થાનિક તપાસ-સમિતિના અહેવાલના આધારે એકેડેમિક કાઉન્સિલની આ સાથે સામેલ ભલામણો મંજૂર કર્યાનું :

ક્રમાંક	કૉલેજનું નામ	જોડાણના વિષયો
૧.	સેંટ ઝેવિયર્સ કૉલેજ, અમદાવાદ	બી.એસસી. (સ્પે.)માં ઇલેક્ટ્રોનિક્સ
૨.	શ્રી જે. એલ. કે. કોટેચા એન્ડ શ્રીમતી એસ. એસ. ગાર્ડી કૉમર્સ કૉલેજ, કાંકણપુર	બી.એ. (પ્રિન્સિ.)માં ગુજરાતી, હિન્દી, સંસ્કૃત, સમાજશાસ્ત્ર; બી.એ. (ગૌણ)માં ઇતિહાસ, માનસશાસ્ત્ર, અંગ્રેજી, અર્થશાસ્ત્ર; બી.કૉમ. (મુખ્ય)માં એડ. એકા. એન્ડ ઑડિટિંગ; બી.કૉમ.(ગૌણ)માં એડ. સ્ટેટિસ્ટિક્સ
૩.	એમ. એચ. ગાંધી આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, કાલોલ	બી.એ. (પ્રિન્સિ.)માં ગુજરાતી, સંસ્કૃત, સમાજશાસ્ત્ર; બી.એ. (ગૌણ)માં મનોવિજ્ઞાન, અર્થશાસ્ત્ર; બી.કૉમ. (મુખ્ય)માં એડ. એકા. એન્ડ ઑડિટિંગ; બી.કૉમ. (ગૌણ)માં એસ.પી. આંકડાશાસ્ત્ર
૪.	ધી મહેમદાવાદ એજ્યુકેશન સોસાયટી આર્ટ્સ અને કૉમર્સ કૉલેજ, મહેમદાવાદ	ફર્સ્ટ બી.એ., બી.કૉમ. નવું જોડાણ
૫.	પટેલ જે. બી. રૂદેલવાલા આર્ટ્સ, પટેલ એ. એમ. રૂદેલવાલા કૉમર્સ કૉલેજ, અને જે. ડી. કે. દાવોલવાળા સાયન્સ કૉલેજ, બોરસદ	બી.એ. (ગૌણ)માં કૉમ્પ્યુટર મેથડ્સ; બી.એસસી. (ગૌણ)માં કૉમ્પ્યુટર સાયન્સ અને બી.કૉમ. (ગૌણ)માં કૉમ્પ્યુટર ઇન બિઝનેસ ઓપરેશન
૬.	એમ. એન્ડ વી. આર્ટ્સ અને કૉમર્સ કૉલેજ, હાલોલ	બી.કૉમ. (ગૌણ)માં કૉમ્પ્યુટર ઇન બિઝનેસ ઓપરેશન
૭.	શ્રીમતી એચ. સી. પટેલ ફરતીકૂઈવાળા કૉમર્સ કૉલેજ, ડભોઈ	બી.કૉમ. (ગૌણ)માં કૉમ્પ્યુટર ઇન બિઝનેસ ઓપરેશન

ક્રમાંક	કૉલેજનું નામ	જોડાણના વિષયો
૮.	એન. સી. બોડીવાલા કૉમર્સ કૉલેજ, અમદાવાદ	બી.કૉમ. (ગૌણ)માં કૉમ્પ્યુટર ઇન બિઝનેસ ઓપરેશન
૯.	એમ. એન્ડ વી. આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, હાલોલ	બી.એ. (મુખ્ય)માં અંગ્રેજી
૧૦.	શેઠ ટી. સી. કાપડિયા આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, બોડેલી	બી.કૉમ. (ગૌણ)માં કૉમ્પ્યુટર સાયન્સ
૧૧.	શેઠ પી. ટી. આર્ટ્સ એન્ડ સાયન્સ કૉલેજ, ગોધરા	બી.એ. (મુખ્ય)માં અંગ્રેજી
૧૨.	આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, કપડવંજ	બી.એ. (મુખ્ય)માં અંગ્રેજી અને બી.કૉમ. (ગૌણ)માં આંકડાશાસ્ત્ર
૧૩.	કે. બી. ઇન્સ્ટિટ્યૂટ ઑફ ફાર્માસ્યુટિકલ એજ્યુકેશન એન્ડ રિસર્ચ, ગાંધીનગર	થર્ડ બી.ફાર્મ.ના વિવિધ વિષયો
૧૪.	સરસપુર આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, અમદાવાદ	બી.એ.માં પ્રથમ ગૌણ ભૂગોળ અને બી.એ. (ગૌણ)માં સંસ્કૃત
૧૫.	ઉમા આર્ટ્સ એન્ડ નાથીબા કૉમર્સ કૉલેજ, ગાંધીનગર	બી.એ. (મુખ્ય)માં ભૂગોળ
૧૬.	આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, મુવાલ	બી.એ. (ગૌણ)માં સંસ્કૃત, સમાજશાસ્ત્ર; બી.એ. (મુખ્ય)માં ગુજરાતી, અર્થશાસ્ત્ર; બી.કૉમ. (મુખ્ય)માં એડ. એકા. એન્ડ ઑડિટિંગ; બી.કૉમ. (ગૌણ)માં એસ.પી.

(નોંધ.-સ્થાનિક તપાસસમિતિનો હેવાલ તથા એકેડેમિક કાઉન્સિલની ભલામણો **પરિશિષ્ટ "૨૪/૧થી ૨૪/૧૬"** તરીકે સામેલ છે.)

૨ (૨૮). જુદી જુદી સંસ્થાઓ તરફથી જૂન, ૧૯૯૭થી નવી કૉલેજ શરૂ કરવા માટેની જોડાણઅરજી પરત્વે નિયુક્ત કરેલ જરૂરિયાત સમિતિની તા. ૮-૧-૧૯૯૭ના રોજ મળેલ (નીડ કમિટી) બેઠકની કાર્યવાહી મંજૂર કર્યાનું;

(સમિતિની ભલામણ **પરિશિષ્ટ "૨૫"** તરીકે સામેલ છે.)

૨ (૨૯). એક્ષેલન્સ એજ્યુકેશન મુવમેન્ટ ટ્રસ્ટ, અમદાવાદ જૂન, ૧૯૯૭થી વાણિજ્ય વિદ્યાશાખાની નવી કૉલેજ શરૂ કરવા માટેની જોડાણઅરજી પરત્વે નિયુક્ત કરેલ નીડ તથા સ્થાનિક તપાસસમિતિનો હેવાલ સ્વીકાર્યાનું અને તે પરત્વે દર્શાવેલ ભલામણો એકેડેમિક કાઉન્સિલ વતી મંજૂર કર્યાનું;

(એકેડેમિક કાઉન્સિલની ભલામણ તથા હેવાલની નકલ **પરિશિષ્ટ "૨૬"** તરીકે સામેલ છે.)

૨ (૩૦). જૂન, ૧૯૯૭થી વાણિજ્ય વિદ્યાશાખાની નવી કૉલેજ શરૂ કરવાની મંજૂરી એક્ષેલન્સ એજ્યુકેશન મુવમેન્ટ ટ્રસ્ટ, અમદાવાદને નિયત શરતોના પરિપાલન કરવાની શરતે પ્રથમ વર્ષ બી.કૉમ.ના વર્ગનું જોડાણ આપવાની મંજૂરી આપવામાં આવી હતી પરંતુ સદરહુ ટ્રસ્ટે એકેડેમિક કાઉન્સિલની શરતોનું પરિપાલન નિયત સમયમર્યાદા સુધીમાં કરી શકેલ નહીં હોવાથી જોડાણ અંગે કોઈ કાર્યવાહી કરવાની રહેતી નથી, તેની નોંધ લેવા બાબત.

૨ (૩૧). મહિલા મહાવિદ્યાલય, વડોદરાની જૂન, ૧૯૯૭થી શિક્ષણની અને વિનયનની વિદ્યાશાખાની અલગ કૉલેજનું જોડાણ એસ.એન.ડી.ટી. યુનિવર્સિટી મુંબઈમાંથી અલગ થઈ ગુજરાત યુનિવર્સિટી સાથે જોડાણ મેળવવા માટેની અરજી પરત્વે નિયુક્ત કરેલ નીડ અને સ્થાનિક તપાસસમિતિનો હેવાલ આવ્યો હોઈ તે અંગેની ભલામણો મંજૂર કર્યાનું.

(નોંધ.-એકેડેમિક કાઉન્સિલની ભલામણ તથા હેવાલની નકલ **પરિશિષ્ટ "૨૭"** તરીકે સામેલ છે.)

૨ (૩૨). વકીલ કે. એમ. એલ. એજ્યુકેશન સોસાયટી, કઠલાલ તરફથી જૂન, ૧૯૯૭થી વિનયન-વાણિજ્ય વિદ્યાશાખાની નવી કૉલેજ શરૂ કરવા અંગેની અરજી પરત્વે નીડ તથા સ્થાનિક તપાસસમિતિએ કૉલેજની જરૂરિયાત સ્વીકારી નથી તેની નોંધ લેવા બાબત.

(નીડ તથા સ્થાનિક તપાસસમિતિનો હેવાલ **પરિશિષ્ટ "૨૮"** તરીકે સામેલ છે.)

૨ (૩૩). ખેડા આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, ખેડાની જૂન, ૧૯૯૭થી બી.એ. (ગૌણ)માં સમાજશાસ્ત્રનો વિષય શીખવવા માટેની ચાલુ જોડાણઅરજી પરત્વે નિયુક્ત કરેલ સ્થાનિક તપાસસમિતિનો હેવાલ આવ્યો હોઈ તે પરત્વે એકેડેમિક કાઉન્સિલની ભલામણ એકેડેમિક કાઉન્સિલ વતી સ્વીકાર્યાનું;

(એકેડેમિક કાઉન્સિલની ભલામણ તથા હેવાલની નકલ **પરિશિષ્ટ "૨૯"** તરીકે સામેલ છે.)

૨ (૩૪). એમ. એસ. ભગત એન્ડ સી. એસ. સોનાવાલા લૉ કોલેજ, નડિયાદમાં જૂન, ૧૯૯૭થી ડિપ્લોમા ઇન ટેક્સેશન લૉઝ એન્ડ પ્રેક્ટિસના અભ્યાસક્રમની ચાલુ જોડાણઅરજી પરત્વે નિયુક્ત કરેલ સ્થાનિક તપાસસમિતિના હેવાલ પરત્વે એકેડેમિક કાઉન્સિલની ભલામણ સ્વીકાર્યાનું;

(એકેડેમિક કાઉન્સિલની ભલામણ અને સ્થાનિક તપાસસમિતિના હેવાલની નકલ **પરિશિષ્ટ "૩૦"** તરીકે સામેલ છે.)

૨ (૩૫) જૂન, ૧૯૯૭થી સરદાર પટેલ ઇન્સ્ટિટ્યૂટ ઑફ ટેક્નોલોજી, વાસદ ખાતે ઇજનેરી વિદ્યાશાખાની નવી કોલેજ શરૂ કરવા માટેની આવેલ જોડાણઅરજી પરત્વે નિયુક્ત કરવામાં આવેલ જરૂરિયાત તથા સ્થાનિક તપાસસમિતિના હેવાલના આધારે સામેલ એકેડેમિક કાઉન્સિલની ભલામણ સ્વીકાર્યાનું;

(એકેડેમિક કાઉન્સિલની ભલામણ તથા હેવાલની નકલ **પરિશિષ્ટ "૩૧"** તરીકે સામેલ છે.)

૨ (૩૬). અકાઉન્ટ વિષયની અભ્યાસસમિતિએ ૧૯૯૬ જૂનથી ફર્સ્ટ બી.કોમ.ના કમ્પલસરી એકાઉન્ટ અને [illegible] એકાઉન્ટિંગ એન્ડ ઑડિટિંગના સુધારેલ અભ્યાસક્રમમાં સુધારો કરવા તેમજ સદરહુ સુધારો જૂન, ૧૯૯૭થી અમલમાં લેવા કરેલ ભલામણ સ્વીકારીને કોલેજોને પરિપત્રિત કર્યાનું;

(નોંધ:-સુધારેલ અભ્યાસક્રમની નકલ **પરિશિષ્ટ "૩૨"** તરીકે સામેલ છે.)

૨ (૩૭) કેમિકલ એન્જિનિયરિંગની અભ્યાસસમિતિની તા. ૩-૯-૧૯૯૭ની સભાએ બી.ઈ. (રબ્બર ટેક્નોલોજી), બી.ઈ. (પ્લાસ્ટિક ટેક્નોલોજી) અને બી.ઈ. (કેમિકલ) એન્જિનિયરિંગનો સુધારેલો અભ્યાસક્રમ તા. ૧૦-૯-૧૯૯૭ની ઇજનેરી વિદ્યાશાખાએ મંજૂર કરી સપ્ટેમ્બર, ૧૯૯૭થી અમલમાં લેવાની કરેલ ભલામણ સ્વીકાર્યાનું;

(નોંધ:-નવા અભ્યાસક્રમની નકલ **પરિશિષ્ટ "૩૩"** તરીકે સામેલ છે.)

૨ (૩૮) [illegible] ઇન્ફર્મેશન ટેક્નોલોજીની અસ્થાયી સમિતિની તા. ૯-૭-૧૯૯૭ની સભાએ પ્રથમ વર્ષ [illegible] (ઇન્ફર્મેશન ટેક્નોલોજી)ના (૧) એપ્લિકેશન પેકેજીસ-૧ અને (૨) પ્રોગ્રામિંગ લેંગ્વેજીસ [illegible] નવા અભ્યાસક્રમ તા. ૧૦-૯-૧૯૯૭ની ઇજનેરી વિદ્યાશાખાએ મંજૂર કરી સપ્ટેમ્બર, [illegible] અમલમાં લેવાની કરેલ ભલામણ સ્વીકાર્યાનું;

(નોંધ:-નવા અભ્યાસક્રમની નકલ **પરિશિષ્ટ "૩૪"** તરીકે સામેલ છે.)

[illegible] બી.ઈ. સિવિલ એન્જિનિયરિંગની અભ્યાસસમિતિની તા. ૯-૭-૧૯૯૭ની સભામાં બી.ઈ. (સિવિલ) [illegible] ટેક્નોલોજી એન્ડ મેનેજમેન્ટ વિષયનો નવો અભ્યાસક્રમ સેમ. ૩થી ૮, તા. ૧૦-૯ [illegible] ફેકલ્ટીએ મંજૂર કરી ૧૯૯૭-૯૮ના શૈક્ષણિક વર્ષથી અમલમાં લેવા કરેલ ભલામણ સ્વીકાર્યાનું.

(નોંધ:-નવા અભ્યાસક્રમની નકલ **પરિશિષ્ટ "૩૫"** તરીકે સામેલ છે.)

[illegible] ઉપર્યુક્ત બાબત ૨(૧)થી ૨(૩૯)માં દર્શાવેલ કાર્યોની નોંધ લેવામાં આવી.

૩. યુનિવર્સિટીના નીચેનાં ભવનોમાં ખાલી પડેલ શૈક્ષણિક જગ્યાઓ માટે યોજાયેલ ઇન્ટરવ્યૂ અંગે વરણીસમિતિના ભલામણો પર વિચારણા કરવા બાબત :

ક્રમાંક	વિભાગ	હોદ્દો અને વિષય	વરણીસમિતિની સભાની તારીખ
૧	એજ્યુકેશનલ મીડિયા રિસર્ચ સેન્ટર	ડાયરેક્ટર	૧૨-૭-૧૯૯૭
૨	કાયદાશાસ્ત્ર ભવન	પ્રોફેસર ઇન લૉ	૧૨-૭-૧૯૯૭
૩	મનોવિજ્ઞાન ભવન	રીડર ઇન સાયકોલોજી	૧૨-૭-૧૯૯૭
૪	વિજ્ઞાન વિદ્યાભવન (બોટની વિભાગ)	લેક્ચરર	૧૨-૭-૧૯૯૭
૫	[illegible] ભવન	પ્રોફેસર ઇન સંસ્કૃત	૨૬-૭-૧૯૯૭
૬	ભાષા-સાહિત્ય ભવન	રીડર ઇન સંસ્કૃત	૨૬-૭-૧૯૯૭
૭	મનોવિજ્ઞાન ભવન	રીડર ઇન ફિલોસોફી	૨૬-૭-૧૯૯૭
૮.	વિજ્ઞાન વિદ્યાભવન	રીડર ઇન લાઈફ-સાયન્સ	૨૬-૭-૧૯૯૭
૯.	વિજ્ઞાન વિદ્યાભવન	રીડર ઇન ફિઝિક્સ	૨૬-૭-૧૯૯૭
૧૧.	સમાજવિદ્યા ભવન	લેક્ચરર ઇન ઇકોનોમિક્સ	૨૬-૭-૧૯૯૭
૧૨	સમાજવિદ્યા ભવન	પ્રોફેસર ઇન સોશિયોલોજી	૨૬-૭-૧૯૯૭
૧૩	ગ્રંથાલયશાસ્ત્ર ભવન	લેક્ચરર ઇન લાઇબ્રેરી એન્ડ ઇન્ફર્મેશન સાયન્સ	૨૭-૭-૧૯૯૭
૧૪	બી. કે. સ્કૂલ ઑફ બિઝનેસ મેનેજમેન્ટ	પ્રોફેસર ઇન બિઝનેસ મેનેજમેન્ટ	૨૭-૭-૧૯૯૭
૧૫.	બી. કે. સ્કૂલ ઑફ બિઝનેસ મેનેજમેન્ટ	ટીચિંગ રિસર્ચ એસોસિયેટ	૨૭-૭-૧૯૯૭
૧૬.	વિજ્ઞાન વિદ્યાભવન (ગણિત વિભાગ)	લેક્ચરર ઇન મેથેમેટિક્સ	૧૬-૮-૧૯૯૭
૧૭.	વિજ્ઞાન વિદ્યાભવન	લેક્ચરર ઇન ઝૂલોજી	૧૬-૮-૧૯૯૭
૧૮.	એમ.સી.એ. અભ્યાસક્રમમાં	લેક્ચરર ઇન કૉમ્પ્યુટર સાયન્સ	૧૬-૮-૧૯૯૭
૧૯.	ભાષા-સાહિત્ય ભવન	લેક્ચરર ઇન ઉર્દૂ	૧૬-૮-૧૯૯૭

૩.(૧૦) યુનિવર્સિટીના સમાજ વિદ્યાભવન ખાતે ખાલી પડેલ રીડર ઇન ઇકોનોમિક્સની જગા માટે તા. ૨૬-૭-૧૯૯૭ના રોજ મળેલ વરણીસમિતિની ભલામણ પર વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે—

(૧) તા. ૧૨-૭-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી ધીરેન અવાશિયાને એજ્યુકેશનલ મીડિયા રિસર્ચ સેન્ટરમાં ડાયરેક્ટરની જગ્યા પર ૪૫૦૦-૭૩૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૨) તા. ૧૨-૭-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી એસ. એસ. પાઠકને પ્રોફેસર ઇન લૉની જગ્યા પર રૂ. ૪૫૦૦-૭૩૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૩) તા. ૧૨-૭-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર રીડર ઇન સાયકોલોજીની અનુસૂચિત જનજાતિ માટે અનામત જગ્યાની પુન: જાહેરખબર આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૪) તા. ૧૨-૭-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર લેક્ચરર ઇન બોટનીની સામાજિક અને શૈક્ષણિક રીતે પછાત વર્ગ માટે અનામત જગ્યાની પુન: જાહેરખબર આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૫) તા. ૨૬-૭-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી વસંતકુમાર [illegible] ભટ્ટને પ્રોફેસર ઇન સંસ્કૃતની જગ્યા પર રૂ. ૪૫૦૦-૭૩૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૬) તા. [illegible] રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી કમલેશકુમાર [illegible] રીડર ઇન સંસ્કૃતની જગ્યા પર રૂ. ૩૭૦૦-૫૭૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૭) તા. [illegible] રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી [illegible] રીડર ઇન ફિલોસોફીની જગ્યા પર રૂ. ૩૭૦૦-૫૭૦૦ના પગારધોરણમાં બે વર્ષના [illegible] સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

[illegible] રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી [illegible] રીડર ઇન લાઈફ સાયન્સની જગ્યા પર રૂ. ૩૭૦૦-૫૭૦૦ના પગારધોરણમાં બે વર્ષના [illegible] સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૯) તા. [illegible] રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી [illegible] રીડર ઇન ફિઝિક્સની સા. શૈ. પછાત વર્ગ માટેની અનામત જગ્યા પર રૂપિયા [illegible] બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ [illegible]

[illegible] રીડર ઇન ઇકોનોમિક્સની જગ્યા ભરવા સારું [illegible] વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી કે. એમ. ભટ્ટની [illegible] બે વર્ષના અજમાયશી સમય ઉપર ગુજરાત હાઈકોર્ટના [illegible] એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી. વધુમાં એમ [illegible] નિમણૂક ગુજરાત હાઈકોર્ટની રીટ પિટિશન સ્પે. સિવિલ એપ્લિકેશન નં. ૬૧૩૯/ [illegible] સ્પષ્ટતા નિમણૂકપત્રમાં કરવાની રહેશે.

[illegible] રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર [illegible] નરેન્દ્રકુમાર આર. પરદેશીને લેક્ચરર ઇન ઇકોનોમિક્સની સા. શૈ. પછાત વર્ગની બે જગ્યાઓ [illegible] પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂકો આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૧૨) તા. ૨૭-૭-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર પ્રોફેસર ઇન સોશિયોલોજીની જગ્યાની પુનઃ જાહેરખબર આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૧૩) તા. ૨૭-૭-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી ગીતા એન. ગઢવીને લેક્ચરર ઇન લાઇબ્રેરી એન્ડ ઇન્ફર્મેશન સાયન્સની સા. શૈ. પછાત વર્ગની અનામત જગ્યા પર રૂ. ૨૨૦૦-૪૦૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૧૪) તા. ૨૭-૭-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી સી. ગોપાલક્રિશ્નનને બી. કે. સ્કૂલમાં પ્રોફેસર ઇન બિઝનેસ મેનેજમેન્ટની જગ્યા પર રૂ. ૪૫૦૦-૭૩૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૧૫) તા. ૨૭-૭-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર (૧) શ્રી માર્ગી સુનિલ પરીખ, (૨) શ્રી ઈંગિતા જૈન, (૩) શ્રી સતીશ કે. નાયરને પસંદગીનાં ક્રમાનુસાર બી. કે. સ્કૂલ ઑફ બિઝનેસ મેનેજમેન્ટમાં ટીચિંગ રિસર્ચ એસોસિયેટની એક જગ્યા પર રૂ. ૨૨૦૦-૪૦૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૧૬) તા. ૧૬-૮-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર અનુસૂચિત જાતિના અનામત બેઠક પર શ્રી નરેન્દ્ર પી. શ્રીમાળી અને બિનઅનામત જગ્યા પર કૌશિક વી. ઠાકરને લેક્ચરર ઇન મેથેમેટિક્સની જગ્યા પર રૂ. ૨૨૦૦-૪૦૦૦ના પગારધોરણ ઉપર બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૧૭) તા. ૧૬-૮-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર (૧) શ્રી દિવ્યા શાહ, (૨) કમલેશકુમાર ડી. શાહને પસંદગીના ક્રમાનુસાર લેક્ચરર ઇન ઝૂલોજીની જગ્યા પર રૂ. ૨૨૦૦-૪૦૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૧૮) તા. ૧૬-૮-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી લાબો હર્ષિદા મોનિલ અને શ્રી જ્યોતિ પરીખને લેક્ચરર ઇન કૉમ્પ્યુટર સાયન્સની બે જગ્યાઓ પર રૂ. ૨૨૦૦-૪૦૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારું એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(૧૯) તા. ૧૬-૮-૧૯૯૭ના રોજ મળેલી ઉપર્યુક્ત વરણીસમિતિની ભલામણ સ્વીકારવી તથા તદઅનુસાર શ્રી અન્સારી કરીમુલ્લા એમ.ને લેક્ચરર ઇન ઉર્દૂની જગ્યા પર રૂ. ૨૨૦૦-૪૦૦૦ના પગારધોરણમાં બે વર્ષના અજમાયશી સમય માટે નિમણૂક આપવા સારુ એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(નોંધ.–વરણીસમિતિની ભલામણો **પરિશિષ્ટ "૩૬/૧થી ૩૬/૧૯"** તરીકે સામેલ છે.)

૪. શ્રીમતી એસ. એમ. એજ્યુકેશન એન્ડ રિસર્ચ ફાઉન્ડેશન, ખંભાત તરફથી ૧૯૯૭થી મહિલા વિનયન અને વાણિજ્ય વિદ્યાશાખાની નવી કૉલેજ શરૂ કરવા આવેલ જોડાણઅરજી પરત્વે યુનિવર્સિટીએ નીડ સ્વીકારી ન હતી તે સામે સંસ્થાએ રાજ્ય સરકારના શિક્ષણ વિભાગમાં કરેલ અપીલ સરકારશ્રીએ તેના તા. ૯-૭-૧૯૯૭ના પત્રાંક ગજય-૧૧૯૬-૨૨૦૪-ખથી નામંજૂર કરી છે તેની નોંધ લેવા બાબત.

આથી ઠરાવવામાં આવે છે કે ઉપરોક્ત બાબતની સાભાર નોંધ લેવામાં આવી.

૫. કુલપતિશ્રીએ મંજૂર કરેલાં નીચેનાં કાર્યો (જાણ સારુ) :

૫ (૧). માન્ય સંસ્થાઓને માન્યતા આપવાની અરજી સાથે લેવાની ફી રૂ. ૧૦,૦૦૦ તથા માન્યતા રિન્યુ કરવાની ફી રૂ. ૨,૦૦૦ની જોગવાઈ કરવા ઑર્ડિ. ૧૨૦-સી-બીમાં સુધારો કર્યાનું અને તેને અમલમા મુક્યાનું;

(નોંધ.–ઑર્ડિ. ૧૨૦-સી-બીનો સુધારો **પરિશિષ્ટ "૩૭"** તરીકે સામેલ છે.)

૫ (૨). મિકેનિકલ એન્જિનિયરિંગની એડહોક સમિતિની તા. ૧૭-૯-૧૯૯૭ની સભાએ બી.ઈ. મિકેનિકલ સેમિ. ૩ અને ૪નો સુધારેલો અભ્યાસક્રમ સપ્ટેંબર, ૧૯૯૭થી અમલી બનાવવા કરેલી ભલામણ સ્વીકાર્યાનું. યુનિવર્સિટી સંલગ્ન ઇજનેરી કૉલેજોને પરિપત્રિત કર્યાનું;

(નોંધ.–બી.ઈ. મિકેનિકલ સેમિ. ૩ના બધા વિષયો અને સેમિ. ૪નો ફ્લ્યુડ મિકેનિક્સનો સુધારેલો અભ્યાસક્રમ **પરિશિષ્ટ "૩૮"** તરીકે સામેલ છે.)

૫ (૩). તા. ૧૪-૭-૧૯૯૭ના રોજ મળેલ મેડિકલ ફેકલ્ટીએ મેડિકલ કાઉન્સિલ ઑફ ઇન્ડિયાએ રેગ્યુલેશન ઑફ મેડિકલ એજ્યુકેશન ૧૯૯૭ અન્વયે ઘડેલ નવા અભ્યાસક્રમના સંદર્ભમાં નવો અભ્યાસક્રમ ઘડવા માટે તેમજ મેડિકલ ફેકલ્ટીના ડી.એમ. અને એમ.સી.એચ. પરીક્ષાના અભ્યાસક્રમનો સમયગાળો વધારવા અંગે અને એ.આઈ.યુ.ના પત્રના સંદર્ભમાં મેડિકલ ફેકલ્ટીમાંથી પ્રતિનિધિ મોકલવા તથા ફર્સ્ટ એમ.બી.,બી.એસ. પાસ થયેલ વિદ્યાર્થીએ યુનિવર્સિટીની અન્ય કૉલેજમાં ટ્રાન્સફર દ્વારા પ્રવેશ મેળવવા મેડિકલ કાઉન્સિલ ઑફ ઇન્ડિયાનું "નો ઓબ્જેક્શન" સર્ટિફિકેટ મેળવવા માટે કરેલ ઠરાવ ૧થી ૪ મંજૂર કરી સ્વીકાર્યાનું;

૫ (૪). શૈક્ષણિક વર્ષ ૧૯૯૭-૯૮થી નીચે દર્શાવેલ સંસ્થાઓ તરફથી સ્વનિર્ભર ધોરણોએ બી.બી.એ.ના અભ્યાસક્રમ શરૂ કરવા માટેની અરજીઓ પરત્વે નિયુક્ત કરેલ નીડ તેમજ સ્થાનિક તપાસસમિતિનો હેવાલ સ્વીકાર્યાનું અને તે પરત્વે એકેડેમિક કાઉન્સિલની ભલામણો એકેડેમિક કાઉન્સિલ વતી સ્વીકાર્યાનું :

૧. ગુજરાત લૉ સોસાયટી, અમદાવાદ

૨. સરદાર વલ્લભભાઈ એજ્યુકેશન ટ્રસ્ટ, અમદાવાદ

૩. સોમલલિત એજ્યુકેશન એન્ડ રિસર્ચ ફાઉન્ડેશન; અમદાવાદ

આથી ઠરાવવામાં આવે છે કે ઉપરોક્ત બાબત ૫(૧)થી ૫(૪)માં દર્શાવેલ કાર્યોની નોંધ લેવામાં આવી.

(એકેડેમિક કાઉન્સિલની ભલામણ તથા હેવાલની નકલ **પરિશિષ્ટ "૩૯"** તરીકે સામેલ છે.)

૬. કાયદા વિદ્યાશાખાની સંલગ્ન કૉલેજોમાં વ્યાખ્યાતાઓની જગ્યાઓ માટેની શૈક્ષણિક લાયકાતના અગાઉના ધોરણોની મુદત તા. ૩૧-૧૨-૧૯૯૮ સુધી લંબાવી આપવા અંગે કાયદા વિદ્યાશાખાએ તેની તા. ૨૧-૯-૧૯૯૬ની સભામાં કરેલ નીચેની ભલામણ પર વિચારણા કરવા બાબત :

"The Faculty of Law recommends to the University that in view of the non-availability of qualified candidates for the apointment as full- time Law Teachers as per U.G.C. norms, the Gujarat University's letter prescribing the minimum qualifications for the Post of Lecturer in Law at Sr. No. 2, should be extended for further stipulated period upto 31-12-1998."

આથી ઠરાવવામાં આવે છે કે કાયદા વિદ્યાશાખાની સંલગ્ન કૉલેજોમાં વ્યાખ્યાતાઓની જગ્યાઓ માટેની શૈક્ષણિક લાયકાતના અગાઉના ધોરણોની મુદત લંબાવી આપવા અંગે કાયદા વિદ્યાશાખાએ તેની તા. ૨૧-૯-૧૯૯૬ની સભામાં કરેલ ઉપરોક્ત ભલામણનો સ્વીકાર કરવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

૭. આ યુનિવર્સિટીમાંથી બી.બી.એ.ની પરીક્ષા પાસ કરેલ વિદ્યાર્થીઓને એમ.કૉમ.માં બિઝનેસ મેનેજમેન્ટ વિષયમાં પ્રવેશપાત્ર ગણવા અંગે ઑર્ડિ. એમ.કૉમ. ૧માં સુધારો કરવા વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે આ યુનિવર્સિટીમાંથી બી.બી.એ.ની પરીક્ષા પાસ કરેલ વિદ્યાર્થીઓને એમ.કૉમ.માં બિઝનેસ મેનેજમેન્ટ વિષયમાં પ્રવેશપાત્ર ગણવા અંગે આ સાથે સામેલ કર્યા મુજબ ઑર્ડિ. એમ.કૉમ. ૧માં સુધારો કરવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(નોંધ.–સુધારેલ ઑર્ડિ. **પરિશિષ્ટ "૪૦"** તરીકે સામેલ છે.)

૮. આ યુનિવર્સિટીની માન્ય સંસ્થાઓના નિયામક અને રીડરની નિમણૂક કરવા માટેનાં પ્રવર્તમાન લાયકાતનાં ધોરણોમાં સુધારો કરવા માટે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે આ યુનિવર્સિટીની માન્ય સંસ્થાઓનાં નિયામક અને રીડરની નિમણૂક કરવા માટેના પ્રવર્તમાન લાયકાતનાં ધોરણોમાં આ સાથે સામેલ કર્યા મુજબ સુધારો કરવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(સુચિત લાયકાતના ધોરણોનું **પરિશિષ્ટ "૪૧"** તરીકે સામેલ છે.)

૯. કુલપતિશ્રીએ મંજૂર કરેલાં નીચેનાં કાર્યો (જાણ સારુ) :

૯ (૧). પોસ્ટ-ગ્રેજ્યુએટ એડવાન્સ ડિપ્લોમા ઇન બાયોમેડિકલ ટેક્નોલોજીનો અભ્યાસક્રમ તૈયાર કરવા કુલપતિશ્રીએ નિયુક્ત કરેલ સમિતિની તા. ૨૦-૮-૧૯૯૭ની સભાએ સ્વનિર્ભર ધોરણે પી.જી. એડવાન્સ ડિપ્લોમા ઇન બાયોમેડિકલ ટેક્નોલોજીનો અભ્યાસક્રમ શૈક્ષણિક વર્ષ ૧૯૯૭-૯૮થી અમલી કરવા કરેલી ભલામણ સ્વીકાર્યાનું;

૯ (૨). તોલાણી કોલેજ ઑફ આર્ટ્સ અને સાયન્સ, આદિપુર-કચ્છમાં માન્ય અનુસ્નાતક શિક્ષકની અનઉપલબ્ધીના કારણે ૧૯૯૮-૯૯ના વર્ષથી હિન્દી વિષયનું અનુસ્નાતક કેન્દ્ર ક્રમશ: બંધ કરવા માટે મંજૂરી આપ્યાનું;

આથી ઠરાવવામાં આવે છે કે ઉપરોક્ત બાબત ૯(૧) અને ૯(૨)માં દર્શાવેલ કાર્યોની નોંધ લેવામાં આવી.

(નોંધ.–બાબત ક્રમાંક ૯(૧)નો નવો અભ્યાસક્રમ પરિશિષ્ટ "૪૨" તરીકે સામેલ છે.)

૧૦. રાજ્યની યુનિવર્સિટીઓની બિનસરકારી કાયદા વિદ્યાશાખાની સંલગ્ન કૉલેજોને શૈક્ષણિક વર્ષ ૧૯૯૬-૯૭થી અનુદાનપાત્ર ગણવા બાબત ગુજરાત સરકારના શિક્ષણ વિભાગના તા. ૫-૯-૧૯૯૭ના ઠરાવ ક્રમાંક : એન.જી.સી. ૧૫૯૬-સી.સી. ૧૩૧/ખની નોંધ લેવા બાબત.

આથી ઠરાવવામાં આવે છે કે ગુજરાત સરકારના શિક્ષણ વિભાગનાં તા. ૫-૯-૧૯૯૭ના ઉપરોક્ત ઠરાવની સાભાર નોંધ લેવામાં આવી.

(નોંધ.-સદરહુ ઠરાવની નકલ પરિશિષ્ટ "૪૩" તરીકે સામેલ છે.)

ત્યાર બાદ પ્રમુખશ્રીની પરવાનગીથી નીચેની બાબતો રજૂ કરવામાં આવી.

૧૧. ઈજનેરી વિદ્યાશાખાની તા. ૧૦-૯-૧૯૯૭ની સભામાં જુદા જુદા અભ્યાસક્રમો સપ્ટેંબર, ૧૯૯૭થી અમલી કરવા કરેલી ભલામણો અંગે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે ઈજનેરી વિદ્યાશાખાની તા. ૧૦-૯-૧૯૯૭ની સભામાં જુદા જુદા અભ્યાસક્રમો સપ્ટેંબર, ૧૯૯૭થી અમલી કરવા માટે કરેલ ભલામણો સ્વીકારવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

(સદરહુ વિદ્યાશાખાની તા. ૧૦-૯-૧૯૯૭ની મળેલ સભાની નોંધ પરિશિષ્ટ "૪૪" તરીકે સામેલ છે.)

૧૨. બી.ઈ. કોમ્પ્યુટર એન્જિનિયરિંગ વિષયની એડહોક અભ્યાસ સમિતિએ તેની તા. ૨૦-૯-૧૯૯૭ની સભામાં બી.ઈ. કોમ્પ્યુટર એન્જિનિયરિંગનો ૩થી ૮ સેમેસ્ટરનો સુધારેલ અભ્યાસક્રમ સપ્ટેંબર, ૧૯૯૭થી અમલમાં લેવા કરેલ ભલામણ અંગે વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે સદરહુ અભ્યાસક્રમ મંજૂર કરવો અને તેનો અમલ સપ્ટેંબર, ૧૯૯૭થી કરવાનું રાખવું.

(અભ્યાસક્રમની નકલ પરિશિષ્ટ "૪૫" તરીકે સામેલ છે.)

ત્યાર બાદ સભાનું કામકાજ પૂરું થયું હતું.

નં. એકે. કાઉ/૧૩૬૮૭/૧૯૯૮
ગુજરાત યુનિવર્સિટી, અમદાવાદ-૩૮૦ ૦૦૯
તા. ૨૮-૧-૧૯૯૮.

એમ. પી. જડિયા
કુલસચિવ

પરિશિષ્ટ '૧'

કામકાજ ક્રમાંક ૨(૧)

(5) MATHEMATICS

(F.Y. B.A./F.Y. B.Sc.) (New Course)

(In force from June, 1996)

Paper I : Calculus and Differential Equations. ... 105 Marks.

Calculus :

Unit 1 : *Successive Derivatives* : Standard results for n^{th} derivative, Leibaitz's Rule,

Unit 2 : Convergence and divergence of infinite series :

Comparison test, Ratio test, Root test, Convergence of power series.

Unit 3 : *Mean value Theorems* : Rolle's, Lagrange's and Cauchy's mean value theorems

Taylor's Theorem : Expansion in power series of : $\sin x \cos x$, $\log(1 - x)$, e^x, $(1 + x)^n$ (under proper restriction if any).

Unit 4 : *Intermediate forms* : L 'Hospital's rule.

Curve Tracing : Increasing and decreasing nature of a function, Criteria for concavity upwards and concavity downords, Points of inflexion, Asymptotes, Tracing of plane curves in cartesian and polar co-ordinates (Catenary, Cycloid, Cardioid, Folium of Descartes, Astroid, Limacon, Cissoid)

Unit 5 : *Integration* : Reduction formula $\int_0^{2} \sin^m x \cos^n x\,dx$ (m, n non-negative integers)

Applications of definite integrals to :

(1) Summation of series

(2) Rectification

(3) Surface and volume of revolution.

Unit 6 : Differential Equations . Family of curves leading to differential equation and conversely its solution leading to a family of curves, Constants of integration Boundary / initial conditions Exact differential equations of two variables. First order linear and highest degree equations and their applications.

Unit 7 : Linear differential equations with constant co-efficients and those reducible to this type. Second order linear differential equations.

Books for reference

1.	Differential Calculus	Shantinarayan
2.	Integral Calculus	Shantinarayan
3.	Introductory course in differential equation	Murry
4.	Elementary differential equation	Kells
5.	[illegible]	: [illegible] અને ડૉ. વાય. આર. શેઠ, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ

Paper II : Linear Algebra and Geometry. ... 105 Marks.

I Linear Algebra : (Prerequsites, Binary operations, concepts of group, ring and fields).

Unit 1 : Vector space over R their elementary properties, subspaces and span of a finite set of vectors, linear combinations of vectors, linear dependence and independence

Unit 2 : Basis and dimension of a finite-dimensional vecor space and related results. Linear sum and direct sum of two subspaces.

Unit 3 : Linear transformation range and kernel of linear transformation rank and nullity. [illegible] Composition of linear transformations, its inverse

Unit 4 : Linear Transformations and Matrices Co-ordinate System Matrix associated with a linear transformation and a linear transformation associated with a matrix.

Polar co-ordinates, polar and cartesian coldinate systems, and mutual relations Equation of a conic in polar form

Unit 5 : Sphere [illegible] section of a line and a sphere, Equation of tangent plane and normal, plane section of a sphere, Intersection of two spheres, angle between two spheres, orthogonal sphere.

Unit 6 :Cone and Cylinder, Definition of a cone, its vertex and guiding curve, its equation; given vertex and guiding curve. Homogenous equation and cone having vertex origin. Right circular cone. Its equation, given vertex, axis and semi vertical angle.

Definition of a cylinder, its equation with generators intersecting a curve and parallel to a line. Right circular cylinder. Its equation with given exis and radius.

Unit 7 : Conicoids, Central and non-central conicoids, ellipsoid, hyperboloids of one sheet and two sheets, elliptic and hyperbolic parabolic, Intersection of a line and a conicoid. Equation of tangent plane and normal.

The course of Linear algebra is roughly covered by 'Introduction to linear algebra' by V. Krishna Murthy, V. P. Mainara and J. L. Arora. Affiliated East-West Press, Pvt. Ltd., New Delhi, 1976.

(Chapters 1 and 2 are pre-requesites)

Chapter 3 (Omit art 3.4.5, 3.4.6, 3.4.7, 3.5.16)

Chapter 4 (Omit art 4.5.2, 4.5.3, 4.8, 4.9)

Chapter 5 only articles 5.1 and 5.2 to be considered

List of reference books

1	Linear Algebra	: Sushma Verma (Macmillan & Co.)
2.	Co-ordinate Geometry of Three Dimensions	: Shantinarayan
૩.	સુરેખ બીજગણિત	: આઈ. એ. શેઠ (યુનિ. ગ્રંથ નિર્માણ બોર્ડ, અમદાવાદ)
૪.	સુરેખ બીજગણિત	: એલ. કે. પટેલ (યુનિ. ગ્રંથ નિર્માણ બોર્ડ, અમદાવાદ)
૫.	વૈશ્લેષિક ભૂમિતિ	: ડી. એસ. બસન, એન. વી. પટેલ (યુનિ. ગ્રંથ નિર્માણ બોર્ડ, અમદાવાદ)
6.	Linear Algebra	: Ram Chandra Rao (Tata MacGraw Hill).

પરિશિષ્ટ '૨'

કામકાજ ક્રમાંક ૨ (૨)

S.Y. B.Com. Syllabus

ADVANCED ACCOUNTING AND AUDITING—PAPER II (New Course)

(Principal and Subsidiary)

(Effective from June, 1997)

1. Issue of shares (on pro-rata basis), forfeiture and re-issue of forfeited shares; Issue of shares for consideration other than cash.
2. Underwriting of shares : Determination of underwriters' liabilities and accounting treatment in the books of the Company.
3. Issue and redemption of debentures excluding purchase of own debentures.
4. Alternation of capital :
   - (i) Increase of capital; consolidation of shares; Conversion of share capital into stock and reconversion of stock into share capital; subdivision of shares; cancellation of unissued capital.
   - (ii) Redemption of Redeemable Preference shares under section 80 of the Companies Act, 1956.
   - (iii) Issue of Bonus shares (including application of guidelines for issue of Bonus shares, as may be in force on 31st March of the preceding academic year).
5. Capital reduction (internal reconstruction).
6. Purchase of business of a firm by the Co.-Accounting treatment in the books of the Company.
7. Company final accounts (Excluding computation of managerial remuneration). Concept and Accounting treatment of Tax-provision, Gross-Block, Net Block, Dividend, Pre and Post incorporation period. Profit/Loss.
8. Liquidation of companies (voluntary liqui.) – preparation of liquidator's final statement of accounts.

Note.—1 In company final accounts, problems connected with other topics are not expected.

2 The paper to be set at the University examination should cover question/s, testing conceptual knowledge through objective questions (at least one) and short question/s (at least one) and should also cover two full length questions.

ADVANCED ACCOUNTING AND AUDITING—PAPER III (New Course)

(Effective from June 1997)

(Principal Paper)

I. Cost Accounting : **50%**

(a) Prime Cost :

1. Materials : Definition and types of materials–Ordering and receiving of materials from the view-point of control–Bin cards, Stock record cards–Periodic and perpetual inventory system–Pricing of issue of materials–Effect of pricing issues (Under different methods) on stock valuation–Meaning and accounting of wastage, scrap, spoilage and defectives stock Levels and E.Q.Q. as tools for stores Control.
2. Labour : Direct and indirect labour-Principles of determining wage rate–Various methods of wage payments–Computation under Time wage and Piece wage system and Taylor's–Differential piece wage system–Copartnership and profit sharing scheme–Computation of labour cost rates–Ascertainment and treatment of idle time, overtime, leave with pay and holiday with pay–Meaning, effects and computation of labour turnover.
3. Chargeable expenses and problems connected therewith.

(b) Overheads :

General principles–Classification of overheads Methods of Seggregation of semi-variable overheads, (comput under High and Low point Method only). Allocation and apportionment of overheads (Departmentalisation of overheads)-Reapportionment of service departments Costs; Methods of reapportionment and redistribution of works ovrheads; Methods of absorption of factory overheads, administration and selling and distribution overheads (in theory only)-Under and over-absorption of overheads-Miscellaneous items in overheads-Interest on Capital, Research and Development costs (in theory only.)

(c) Costing Methods :

1. Operating Costing (Practical Problems on Transport Costing).
2. Contract Coasting.

(d) Non-integral (Accounts (in cost ledger) and Reconciliation of Financial Accounts and Cost Accounts).

II Auditing : **50%**

(a) Introduction : Definition; Objectives; Types of Audit; Techniques of Auditing (e.g., Total test and surprise checking).

(b) Internal Control, Internal Check and Internal Audit (Internal check as regards cash, Sales and wage payments only).

(c) **Vouching** : Meaning of Voucher; Definition and objects of Vouching; Vouching of individual transections and of subsidiary books.

(d) **Verification and Valuation of Assets and liabilities** : Meaning; Auditor's duties, verification and valuation of the followings; Goodwill, Leasehold Properties, Plant and Machinery, Investments, Inventory, Accounts Receivables and Payables, Secured Loans, Contingent Liabilities.

(e) **Company Auditor** : Qualifications–disqualifications–appointment–remuneration, removal, Classes of auditors–Status of an auditor, Rights and duties of an auditor–Lien of auditor.

(f) Auditor's Liabilities : Civil, Criminal and Third Party Liabilities.

Notes.—(1) Sections I and II are independent sections and under any method of paper-setting both the sections will have to be treated separately and questions from one section cannot be as option to questions from another section.

(2) (a) In Section I of the paper, one question carrying 20% marks of the section shall be asked testing conceptual knowledge though objective questions (preferably from prime cost).

(b) In Section II of the paper, one question carrying 30% marks of the section shall be asked testing conceptual knowledge though objective questions.

Syllabus of Principles and Procedure of Taxation (New Course)

(Effective from June, 1997)

(I)1. The Incom-Tax Act, 1961 :

(i) Introduction and brief history. **15%**

(ii) Definitions : Agricultural Income, Assesse, Previous Year, Assessment year, Dividend, Income, Gross Total, Income, Total Income, Casual Income, Person and other terms relevant to the prescribed syllabus.

(iii) Charge of Income-tax, Scope of Total Income and Residential status of individual assessee (Section 4 to 9).

(iv) Income-tax Authorities (sections 116 to 120, 124)

(v) Provisions relating to

(a) Return of Income (Sec. 139)

(b) Permanent Account No. (Sec. 139 A)

(c) T.D.S. and Advance Payment of Tax (Sec. 190, 192, 193, 194 A, 207, 208, 211, 214, 215).

2. Computation of Income :

(a) (1) Salary Income : (Section 14, 15, 16, 17) **60%**

Note : Paper-setter shall have to mention whether the assesee is a specified employee under I.T. Act 1961 or not.

(2) Income from House-property (Sections 22 to 27)

(3) Profits and gains of Business or proffesion (Sections 28 to 32 (exclusing 32 A & B), 36 to 38, 43 B).

(4) Capital Gains : (Sections 45 to 51, 54, 54 F, 54 E A & E B, 55).

Note : Relavant Cost Inflation Index Nos. must be provided by the paper-setter.

(5) Income from other sources : (Sections 56 to 59)

Note : T.D.S. rates must be provided by the paper-setter.

(b) Exemptions, Deductions etc. :

(i) Exemptions available to individual assessee only (Sec. 10).

(ii) Deductions (Under Sections 80 D, 80 DD, G. L. & U).

(iii) Rebate of Income-Tax (Sec. 88, 88 B).

(iv) Income of other persons included in assessee's total income (Sections 60 to 65). Note : These provisions are not to be incorporated in practical problems. Only theory questions or objective Questions shall be asked.

(v) Aggregation of income and set-off and carryforward of losses (Sections 66, 68, 69, 69 A, 69 B, 69 C, 70, 71, 71 A, 72, 73, 74, 75).

Note : These provisions are not to be included in practical problems. Only theory questions shall be asked).

II. (a) The Wealth Tax Act, 1957 : **25% (a + b)**

(1) Definitions : Assets, Debts owed, valuation date, assessment year, Net Wealth.

(2) Incidence of Wealth-tax with reference to Residental Status and Citizenship.

(3) Exempted Assets

(4) Computation of Net Wealth

(5) Concept of Valuation of Assets (in theory only).

(b) The Gift Act 1958 :

(1) Definitions : Gift, Deemed Gift, Previous Year, Assessment Year.

(2) Exempted Gifts (including basic exemption).

(3) Computation of Taxable Gifts.

(4) Impact of Advance payment of Gift-tax and Credit for payment of Stamp duty.

(5) Concept of Valuation of a Gift (in theory only).

Notes :—

(1) Provisions applicable to the relevant academic year shall be taken into consideration. No change made effective after the 31st March immediately preceeding the current academic year shall be considered.

(2) The subject should be studied with reference to an individual assessee only. Computation of total Income of an Indian citizen and an Ordinary resident is expected.

(3) Students are not expected to remember the section numbers; while setting a question-paper the topic/aspect should be indicated rather than the section number.

(4) Practical problems carrying not less than 60% marks should be asked.

(5) A latitude of 5% marks in the relative weightage is allowed to the Paper-setter in the marks alloted.

(6) Practical question involving only one head of income can be asked.

(7) One multiple choice question carrying 20% marks (requiring the explanatory working notes) shall be asked.

(8) Computation of total Income (after giving Taxable Incomes under different heads) with deductions under section 80 (as prescribed in the syllabus) can be asked.

પરિશિષ્ટ '૩'

કામકાજ ક્રમાંક ૨(૩)

S.Y.B.Sc. PHYSICS

(Syllabus for the subject of Physics implemented from June, 1997)

Paper III :

1. **Heat and Thermodynamics :** Properties of pure substances, T-S diagram, Gibb's U-V-S surface, Enthalpy, Helmholtz function, Gibb's function, Names and symbols of thermodynamic functions, Two mathematical theorems, Maxwell's equations, First and Second T-ds equations, Energy equations, Difference and ratio of heat capacities, Expansivity, Compressibility, Joule - Thomson effect, Porous plug experiment, Conditions for heating and cooling of gas, Inversion temperature with respect to Van der Waal's equation.

   (Scope : Heat and Thermodynamics by Zeemansky)

   Thermodynamics of thermoelectricity

   (Ref. : University Physics - Sears and Zeemansky 3rd edition).

2. **Solid State Physics :** Crystal Binding : Cohesive energy, characteristics of inert gas solids, Van der Waal's interactions, Total potential energy, condition for stability. Equation of state, Bulk modulus, Ionic crystals, Madellung energy, Covalent crystal, metal crystals, Hydrogen bond.

   (Ref Solid State Physics by Kittel).

   Thermal properties : Introduction, Lattice specific heats, classical theory, Einstein theory, Debye theory of atomic heat, Thermal expansion, Grunesen parameter, Equation of state Gruneisen relation, Thermal conductivity.

   (Ref : Solid State Physics - C. M. Kachhawa, TMH publication, art Nos. 4.1, to 4.6).

3. **Sound :** Ultrasonic waves, Magnetostriction effect, Piezo-electric effect, Uses of ultrasonic waves, Accoustics of auditorium, Quality of sound with Fourier analysis.

4. **Optics :** Matrix method in paraxial optics : Introduction; The matrix method, Unit planes, Nodal planes, A system of two thin lenses.

   (Ref. : Optics by Ajoy Ghatak; article Nos. 3.1 to 3.5).

   Diffraction : Fresnel diffraction by circular aperture, half-period zones, Zone plate, Fresnel diffraction by rectangular slit, Cornu's spiral, Fraunhoffer diffraction by two slits, by 'n' slits, Plane diffraction grading, Rayleigh's criteria, Resolving power of optical instruments, R.P. of grading, R.P. of telescope, Polarisation, Double refraction, Huygen's explanation of double refraction in uniaxial crystal, Calcite crystal, Tourmaline plate, Nicol's prism, Polaroids, Production of elliptically and circularly polarised light (Mathematical treatment, quarter wave plate, Half wave plate, Analysis of Polarised light (Identification of linearly, circularly and elliptically polarised light).

5. **Statistical Mechanics :** Phase spaces, concept of ensemble, Canonical ensemble, Thermodynamical relations in canonical ensemble, Microcanonical ensemble, Grand canonical ensemble.

   Partition function for the system and for the particles–Translational partition function, Gibb's paradox. Sackur-Tetrod–equation, Boltzmann equipartition theorem.

   (Ref. : Statistical Mechanics and properties of matter by ESR Gopal, The Macmillan Company of India Limited, Art. 1.1 to 1.6 and 2.1 to 2.4).

Paper IV :

(1) **Electromagnetics :** Magnetostatics : Electric current, Ohm's law–Electrical conductivity, The calculation of resistance, Magnetic effects, The magnetic field, Force on a current, Biot-Savart law, The laws of magnetostatics, The magnetic potentials, Magnetic dipole in a non-uniform magnetic field, magnetic vector potential due to a small current loop, An alternative method for finding the vector potential A and hence the field B due to a current loop, Magnetic media, Magnetisation, Magnetic field vector, Magnetic susceptibility and permeability, Boundary conditions, Uniformly magnetized sphere in External magnetic field, A comparison of static electric and magnetic fields.

   (Scope : Electromagnetics - by B. B. Laud, Art. Nos. 4.1 to 4.9, 4.11 to 4.20).

(2) **Electronics :**

(a) Solid State Devices, description, characteristics and uses :

   (i) Tunnel diode (3.12)
   (ii) Semiconductor photodiode (3.13)
   (iii) Light emitting diode (3.15)
   (iv) Varactor diode (from 3.7).

   Book recommended : Integrated Electronics by Millman and Halkias.

   (v) Salicon controlled Rectifier (28.1)
   (vi) Unijunction transistor (UJT) (28.5)

   Book recommended : Electronic Devices and circuits by A Mottershead.

(b) Basic characteristics of the transistor : Introduction, Basic transistor amplifier. Two-diode analog for a transistor, input characteristics, transistor collector characteristics, collector cutoff current ICED, Forward current transfer ratio (CE). Permissible operating area of transistor (CE). The basic common bare amplifier. Forward current transfer ratio (Cβ), Relation between α and β, collector cutoff current (ICBO) physical explanation of CB and CE amplifying action. Reduction of CE leakage current to ICED, common collector amplifier–Identifying the transistor leads.

   Book recommended : Chapter IX Elkectronics Devices and circuits by A. Mottershead.

(c) The common base Amplifier : Introduction, Analysis of CB amplifier, The amplifier as hole, Power relationships, Efficiency, Phase relationships, Input waveform considerations. Harmonic distortion.

   Book recommended : Chapter X Electronics Devices and Circuits by A. Mottershead.

(d) The common emitter amplifier : Introduction, Graphical analysis of CE Class A amplifier, Input and output resistance, Effect of adding an AC load, conversion efficiency of efficiency of a Class A amplifier with a direct coupled resistive load. Phase relationships in a CE amplifier, Input waveform consideration, comparision of basic transistor amplifier.

   Book recommended . Chapter XI Electronics Devices and circuits by A. Mottershead.

(e) Thermal Stability (Transistor Biasing) : Introduction, Factors contributing to thermal instability, Effect of tempperature increase, Stability factor S, Common-base stability, collector to base bias. Disadvantages of collector to base bias. Emitter bias, voltage devider bias with emitter bias, Emitter bypass capacitor, Additional stability factors. Plus compensation.

   Book recommended : Chap. XII Electronics Devices and circuits by A. Mottershead.

(f) Hybrid equivalent circuit for a transistor : Introduction, conversion of an amplifier circuit to a standard form, general 'black box' theory, Hybrid h parameters, obtaining the hybrid h parameters, typical h-parameter values, Amplifier equations. Voltage and current gains taking into account Rg of source, Dependance of amp. characteristics on RL and Rg, Comparision of CB, CE and CC characteristics.

   Book recommended : Chap. XIV Electronics Devices and circuits by A. Mottershead.

(g) Logic circuits : (1·1) Binary number system, (1·2) invertors (1·3) OR gates, (1·4) AND gates (1·5) Boolean alpebra, (1·6) NOR gates, (1·7) NAND gates.

   Book recommended : Digital principles and Applications by A. P. Malvino & Leach, 4th Ed. Ch. 1.

3. **Modern Physics :** Spectroscopy, Vector atom model, space quantization, spin, magnetic moments and angular momentum. The Stern-Gerlach experiment, Pauli's exclusion principle, Periodic classification and explanation of configuration of electron in the atoms of elements with some illustrations. Normal Zeeman effect, anomalous Zeeman effect, the magnetic moment of the atom emitted frequencies in anomalous transition, the Laude "g" factor, the paschen-back effect, Stark effect, Idensity and width of spectral lines

   (Scope : Spectroscopy Vol. I by Walker and Straw. Additional Ref. : Atomic and Molecular Spectra by Raj Kumar, Kedar Nath Ram Nath Prakashan - Meerut).

4. **Nuclear Physics :** Tools for doing Nuclear Physics-Physical Tools : Introduction, Interaction between particle and matter, A brief-survey Detectors for Nuclear particles Particle accelerator, Beta - ray spectrometer

   (Ref. : Nuclear Physics - S. B. Patel Art. Nos. 1.1.1 to 1.1.5)

The Q-equation : Introduction, Types of nuclear reactions, the balance of mass and energy in Nuclear reactions, The Q-equation, Solution of the Q-equation.

(Ref : Nuclear Physics by S. B. Patel Art Nos. 3.1 to 3.5).

[illegible] constitution of the nucleus and some of their properties : Introduction, Measurement of Nuclear radius, constituents of the nucleus and their properties, Nuclear spin, moments and statistics.

(Ref : Nuclear Physics by S. B. Patel Art. Nos. 4.1.1, 4.1.3, 4.1.4, 4.1.5).

Paper V

1. **Classical Mechanics :**

(a) Rotation about moving axis, Top, Gyroscope

(b) Collision of particles.

Elastic and inelastic scattering, Elastic scattering, Laboratory and centre of mass system, Kinematics of elastic scattering, in the laboratory system, Inelastic scattering, Cross section, The Rutherford formula.

(Ref : Classical Mechanics by Takwale and Puranik Art. Nos. 7.1 to 7.6).

(c) Moving Coordinate systems : Rotating coordinate systems, Their coriolis force, Motion on the earth Effect of coriolis force on freely falling particles.

(Ref : Classical Mechanics by Takwale and Puranik Art. No. 9.2, 9.3, 9.4 & 9.5).

(d) Mechanics of system of particles, Motion of system with variable mass

(Ref : Classical Mechanics by Takwale and Puranik Art. No. 3.5, 3.6)

1.1 Matrices :

[illegible] matrices, Inversion, rank of a matrix, solution of simultaneous equations, Diagonalization [illegible]

2. Quantum Mechanics :

The Schrödinger equation and probability interpretation for an N-particle system, The [illegible] wave mechanics, Adjoint of an operator and self-adjointness, The [illegible] Degeneracy, Eigen values and Eigen functions of self-adjoint [illegible] delta function, Observables, Completeness and Normalization of Eigen functions, [illegible] Physical interpretation of Eigen values, Eigen functions and [illegible] Momentum Eigen functions, Wave function in momentum space, The uncertainty principle, States with minimum value for uncertainty product, Commuting observables, Removal of degeneracy, Evolution of system with time, Constants of the motion, Non-interacting and interacting systems, Systems of identical particles.

(Ref : Quantum Mechanics by Mathews and Venkatesan Art. Nos. 3.1 to 3.16).

3. Plasma Physics :

Occurrence of Plasma in nature (1.1), Definition of Plasma (1.2), Concept temperature (1.3), Debye Shielding (1.4), The Plasma Parameter (1.5), Criteria for Plasmas (1.6), Applications of Plasma Physics (1.7), Gas discharge (Gaseous Electronics (1.7.1), Controlled Thermonuclear Fusion (1.7.2), Space Physics (1.7.3), Moder Astrophysics (1.7.4), [illegible] energy conversion and Ion propulsion (1.7.5), Solid State Plasma (1.7.6), Gas lasers (1.7.7), Chap. 2 : Introduction (2.1), Uniform E and B fields (2.2, 2.2.1, 2.2.2, 2.2.3), Non uniform B field (2.3, 2.3.1, 2.3.2), Non uniform E field (2.4), Time varying E field (2.5), Time varying B field (2.6)

(Ref : Introduction to Plasma Physics by F. F. Chen, Plenum Press).

4. The special theory of relativity :

The Michelson-Morley experiment, The special theory of relativity, The Galelian Transformation, The Lorentz transformation, The Lorentz Fitzerald contraction, Time dilation, Relativity of mass, mass and energy, some relativistic formulae, Velocity addition, Doppler Effect in light.

(Ref : Concepts of Modern Physics by Beiser Art. Nos.)

5. **Solar Physics :**

Sun and its radiations : Introduction, Astronomical background, General description of the Sun, Solar structure, Sun's outer layers, Composition, Vissible feature on the Sun, More about Sun's outer atmosphere, Temperature of the Corona, Solar flares, Wave radiation from the Sun, Solar EUV radiation and X-rays. Photon flux near Earth, Resonance and fluorescence scattering of solar XUV radiation. Solar visible radiation,

Radio emission, The 10.7 cm radio noise flux, Sun's internal energy source, Model of the Sun's interior, Mode of energy transfer, Hydrogen convection zone.

(Ref : An Introductory course on Space Science and Earth's Environment by S. S. Degaonkar, Gujarat University Publication Art. Nos. 1.1 to 1.17)

Practicals

Paper III :

1. "g" by Bar Pendulum
2. Y-by Koenig's method
3. Optical lever
4. Wavelength of prominent spectral lines by diffraction grating
5. Flatness of plate by Newton's rings
6. Resolving power of grating
7. Resolving power of telescope
8. Wavelength of [illegible] prism
9. Wavelength of [illegible] by Edser's "A" pattern
10. Diffraction by single slit
11. Searle's Goniometer
12. To study double refraction in glycerine using a hollow prism.

Paper IV :

1. Figure of merit of a mirror galvanometer
2. Absolute value of capacity by B. G
3. C_1/C_2 by DeSauty's method
4. High resistance by leakage
5. L by Maxwell's bridge
6. [illegible] Anderson's bridge
7. Uni-junction [illegible]
8. High resistance by equal deflection
9. [illegible]
10. [illegible]
11. [illegible] using hollow prism and benzene
12. To study the variation of I_c and V_{CE} with temperature in fixed bias circuit and collector to [illegible] for CE configuration
13. [illegible] with temperature in fixed bias circuit and potential divider bias circuit for CE configuration.

Paper [illegible]

1. [illegible] formula
2. [illegible] be found by using Simpson's rule)
3. [illegible] Photocell
4. [illegible] ellipticity [illegible] using photocell
5. [illegible]
6. [illegible]
7. [illegible] elements [illegible]
8. [illegible]
9. [illegible] flame
10. [illegible] metal [illegible]
11. To find the value of permeability of free space (μ_0)
12. [illegible]

પરિશિષ્ટ '૪'

કામકાજ ક્રમાંક ૨(૪)

S.Y.B.Sc ZOOLOGY

(In force from June, 1997)

The syllabus is to be completed by assigning three period each of 45 minutes duration and one practical of four periods per week.

There will be one paper in written examination of three hours duration and one practical of five hours duration.

Pattern of Examination :

Theory (written)	*Duration*	*Marks system*	
		External	*Internal*
Paper III	3 hours	70	30
Paper IV	3 hours	70	30
Paper V	3 hours	70	30
Practical I (Based on Paper III)	5 hours	35	15
Practical II (Based on Paper IV)	5 hours	35	15
Practical III (Based on Paper V)	5 hours	35	15

Paper III : Non-chordates, Cytology and Genetics :

(a) *Non-Chordates* : Toxonomy of non-chordates upto classes (excluding minor phyle except Ctenophora and Rotifera), organisation and functional anatomy of following types : Plasmodium, Liver fluke, Leach (excluding circulatory system), Lobster (theory only), Pila.

Mouth parts :

Cockroach – Biting and chewing type

Honeybee – lapping type

Mosquito – Piercing and sucking type

Butterfly – Siphoning type

Housefly – Sponging type.

(b) *Cytology* : Detailed structure and function of Animal Cell.

Properties of protoplasma as a colloidal system

Plasma membrane, Endoplasmic reticulum, Ribosomes, Golgi complex, Mitochondria, Centriole, Cilia, Flagella.

(c) *Genetics* : Incomplete dominance

Non-epistatic interaction of genes (Comb in fowl)

Lethal genes

Cytoplasmic inheritance : 1. Introduction 2. Kappa particles (Paramoecium) 3. Coiling of shell in snail 4. Milk factor in mice.

Paper IV : Chordates, Comparative Anatomy, Histology and Physiology :

(a) *Chordates* . Toxonomy of chordates upto classes, organization and functional anatomy of the following types :

Amphioxus : (Including it's embryology)

Scoliodon : (Excluding skeleton)

Calotes (Excluding skeleton).

(b) Comparative Anatomy : Comparative evolutionary anatomy of vertebrate heart, kidney, aortic arches, skin and its derivatives.

(c) Elementary knowledge of microtechnique methods and staining technique, Histology of Mammalian organs, stomach, intestine, Liver pancreas, kidney.

(d) *Physiology* : The following topics should be studied with reference to mammals.

Circulation :

(a) Physiology of blood, composition of blood, Theories of coagulation of blood, Development and life history of blood cells (R.B.C., W.B.C. & Platelets), lymph, Intra-vascular clotting and fibrinolysis.

(b) Heart - Myogenic and Neuorganic hearts, origin, rate and control of heart beats.

Excretion :

(a) Nitrogenous waste products, Ammonotelic, Ureotelic and Uricotelic animals, Formation of urea and uric acid, structure of Nephron (Mammal).

(b) Mechanism of Urine formation, ultrafiltration, selective absorption and tubular secretion, counter current theory of urine concentration, Acid-base balance.

(c) Respiration : Exchange of gases, Transport of gases, Respiratory pigments, carbon-monoxide poisoning, Respiratory quotient, Control of Respiration.

Paper V : Ecology, Poultry Science, Fishery Biology & Economic Zoology :

(a) *Ecology* :

1. Biosphere : Different divisions of Atmosphere, Hydrosphere and Lithosphere.
2. Functional sub-units of Biosphere, like Bio-cycle, Biocore, biuotop.

   Biotic community : Community concept, community diversity, community stratification in terrestrial habitat, community periodicity, Fluctuations within community and causes.
3. Ecological succession : Kinds of succession, Process of succession, Pattern of succession - Xerossre, Hydrosere, Significance of Ecological succession; Marine Ecosystem.

(b) *Poultry Science* :

1. History and importance of poultry science.
2. Selection of Birds : (Different characters should be taught for selecting the perfect poultry bird).
3. Poultry house - Construction and Equipments.
4. Brooding and different types of brooders.
5. Care of egg laying Hen
6. Gradation of egg and preservation of eggs.

(c) *Fishery Biology* :

Importance and development of Fisheries in Gujarat :

1. Elementary study of major fishes and Fisheries of Gujarat. Fish production and export value of Pomfret, Bombay duck, Gol, Dara, Hilsa, Catla, Rohu, Mrigal, Classification of above mentioned fishes upto families.
2. Preliminary idea of major types of fishing boats and nets in Gujarat; Dug cut canoes, flat bottomed boats, Machwas, Trawlers.
3. Primary knowledge of home aquaria. Popular aquarium Fishes and general maintenance of aquarium.

(d) *Economic Zoology* :

1. Parasites and their control, General account of the following human parasites, their important stages in life cycle, Pathogenecity and control, *Entamoeba histolytica, Ascaris lumbricoides, Enterobius vermicularis, Taenia solium.*
2. Insect pests and their control :

   Insect pests on cotton, wheat and ground nut.

   Infective stages on the above crops.

   Control methods, Biological, Chemicals (using attractants)

   Hormonal regulators, pesticides, Physical (manual removal, modifying agricultural practice, Ploughing, rotation of crops, using pest resistant, hybrid seed vericties.

Study of following larval pests of ground nut, wheat and cotton crops :

1. Ground Nut : (a) White Grubs, (b) Ground nut stem-borer, (c) Red Hairy caterpillar.
2. Wheat : (a) Cut worms, (b) Wheat fly.
3. Cotton : (a) Spotted bail worm (b) Pink bail worm (c) cotton leaf roller.

Practical – I (Based on Paper III)
Non-chordates, Cytology and Genetics

(a) *Taxonomy* : Classification upto classes (excluding minor phyla)

Protozoa	: Arcella, Euglena, Noctiluca, Ceratium, Opalina, Vorticella, Polystomella, Plasmodium.
Porifera	: Leucosolenia, Sycon, Euplectella, Euspongia.

Coelenterata	: Obelia, Physalia, Aurelia, Cerianthus, Gorgonia, Madrepora, Baroe (specimen from Ctenophora).
Platyhelminthes	: Planaria, Bipallium, Liverfluke, Tapeworm, Schistosoma.
Nemathelminthes	: Ascaris, Guineaworm, Filarial worm, Enterobius.
Annelida	: Nereis, Aphrodite, Sabella, Amphitrite, Tubifex, Eurythoe, Pontobdella.
Arthropoda	: Peripatus, Apus, Cyclops, Balanus, Lobster, Prawn, Crab, Centipede, Millipede, Scorpion, Spider, Limulus, Lepisma, Nepa, Ranatra, Rat-flea.
Mollusca	: Chiton, Dentalium, Aplysia, Slug (Vaginulus), Ariophanta, Mytilus, Solen, Sepia, Octopus.
Echinodermata	: Starfish, Brittle star, Sea urchin, Sea cucumber, Sea lity.
Slides & Specimens	: Spicules, Gemmules, Scolex of Taenia, Phyllosoma larva.
Plasmodium	: Study of different stages through permanent slides (Life History).
Liver fluke	: Study of different stages through permanent slides (Life History) Entire animal, capsule, Miracidium, Sporocyst, Redia, Carcaria, T.S. Passing through uterus, testis.
Leech	: Dissections of Digestive, Reproductive and Nervous system. Mounting of jaws, Salivary gland and testicular Nephridium. Permanent slides of T.S. passing through Jaws, Crop. and Stomach.
Lobster	: Study of Appendages (Male & Female) Demonstration of Digestive, Circulatory, Reproductive and Nertvous system.
Pila	: Dissections of Digestive and Nervous system Mounting of Radula, Osphradium, Statocyst.

Mounting of following insect mouthparts :

Cockroach, Mosquito, Honeybee, Housefly, Butterfly.

(b) Study of Animal Cell & Cell Organelles through charts/models : Typical Animal Cell, Plasma membrane, Endoplasmic Reticulum Ribosomes, Golgi complex, Mitochondrion, Centriole, Flagella, Cilia.

(c) Study of Genetics through charts (as per attached list).

(d) Study of Animal collection and Preservation :

— Collecting methods and apparatus

— Killing of Animals (Anaesthetization & Narcotization)

— Fixing and Preserving

— Labelling.

Practical II (Based on Paper IV)

Chordates, Comparative Anatomy, Histology and Physiology

(a) Toxonomy : Classification upto orders, Amphioxus, Salpa, Ascidian, Lamprey, Shark, Ray-fish, Sea-Horse, Suckerfish, Ichthyophis, Salamander, Hyla, Varanus, snake, Crocodile, Turtle, Sparrow, Parrot, Hedgehog, Bat, Ant-eater.

Slides & Specimens :

Amphioxus : T. S. passing through pharynx, Gonads — Egg (uncleaved)

Embryology : Cleavage (any stage)–Blastula (V.S.)–Gastrula (V.S.)–Germ layers formation (V.S.).

Diversities of Life :

Scoliodon : Dissection of (a) Digestive (b) Arterial (c) Urinogenital system and (d) Brain.

Mountings : Placoid scale, Ampulla of Lorenzini.

Calotes : Dissection of (a) Digestive, (b) Arterial, (c) Venous, (d) Urinogenital system and (e) Brain.

Mountings : Collumela auris, Hyoid Apparatus, Pecten, Blood.

(b) Comparative Anatomy :

Kidney : Fish, Amphibia, Reptile, Birds and Mammal – Specimens and/or charts.

Aortic Arches and Hearts : Fish, Amphibia, Reptile, Birds and Mammal – Specimens/Charts.

Skin and its derivatives : Dermal scales, Epidermal scales of Fishes and Reptiles, Different types of feathers of Birds, Mammalian skin, Horn, Nail, Hoof, Hair.

(c) Histology : Study of permanent slides of the following mammalian organs :

T.S. of Stomach, T.S. of Intestine, T.S. of Liver, T.S. of Pancreas, T.S. of Kidney.

(d) Physiology : (i) Differential W.B.C. (Smear only), (ii) Estimation of Haemoglobin percentage (Demonstration only), (iii) Abnormal urine (Bile, Sugar, Albumen).

(e) Micro Technique : Preparation of permanent slides.

Practical III (Based on Paper V)

(Ecology, Poultry Science, Fishery Biology & Economic Zoology)

(a) Ecology : Estimation of total hardness, Calcium hardness and Chlorinity. Ecological adaptation of the animals of the following Habitats :

1. Sedentary and fixed animals : Sponges, Corals, Sea anomones, Gorgonia, Cerianthus, Pennatula Solen, Rock barnacles, Pearl oyster, Featherstar, Ascidian.
2. Tube worms : Arenicola, Sabela.
3. Planktons : Mosquito lervae and Pupae, Daphnia, Cyclops and Noctiluca.
4. Necton : Fish, Prawn.
5. Benthic : Solefish, Rayfish, Electric rayfish, Conch, Cowrie, Bivalve.

(b) Fisheries :

(a) Identification and Classification (upto families) of the following fishes : Pomfret, Bombay duck, Gol, Dara, Hilsa, Catla, Mrigal, Rohu.

(b) Fishing nets and Boats as per syllabus to be shown by models or charts.

(c) Visit to any fresh water Fisheries Centre and Marine Fisheries Centre : Knowledge of induced breeding, fishery products and fishery by-products of economic importance such as Fish liveroil, fish meal, trashfishes, Air bladder, Pearl oyster, Prawn, Conch and Cowrie.

(c) Poultry Science :

(1) Visit to Poultry farm for the knowledge of selection of site for the poultry farm, types of birds, poultry feeding and watering the birds. Incubation, brooding, houses, rearing.

(2) Brooders, feeders, structure of egg.

(d) Parasites and Pests :

(1) Entire Animals : Ascaris, Taenia, Enterobius. Permanent Slides : Entamoeba histolytica, eggs of Ascaris, Slide of cysticercus of Taenia, Scolex of Taenia.

(2) Study of the charts of the larval pests on wheat, cotton and ground nut as per syllabus (List attached).

(Note :— Fauna should be studied in the natural habitat and hence zoological excursion is recommended. The students are required to write a brief report on their excursion in their journal).

Zoology Practical Examination

Practical I

Marks 35 [Time 5 hrs.

Date ....]

(1) Dissect the given animal so as to expose..............system and show it to the examiner. 8

(2) Make a temporary preparation of...............from given animal A. Stain if necessary and show it to the examiner. 4

(3) Mount the mouth parts from given animal and show them to the examiner 5

(4) Solve the given genetic problem with explanation. 4

(5) Identify the specimens 1 to 5 as per instructions : 10

Sp. 1 Identify and classify giving reasons.

Sp. 2 Identify and classify giving reasons.

Sp. 3 Identify and draw labelled diagram only.

Sp. 4 Identify and describe.

Sp. 5 Identify and describe.

(6) Journal. 4

Practical II

Marks 35 [Time : 5 hrs.

Date :. . . . .]

(1) Dissect the given animal so as to expose...........system and show it to the examiner. 10

(2) Make a temporary preparation of...................from given animal. Stain if necessary and show it to the examiner. 5

(3) Perform the given physiological experiment. 6

(4) Identify the specimens 1 to 5 as per instructions : 10

Sp. 1 Identify and classify giving reasons.

Sp. 2 Identify and classify giving reasons.

Sp. 3 Identify and describe.

Sp. 4 Identify and describe.

Sp. 5 Identify and describe.

(5) Journal. 4

Practical III

Marks 35 [Time : 5 hrs.

Date :. . . . .]

(1) Estimate the.........of the given sample water. Record your observation and calculation. 7

(2) Identify and classify the fishes giving reasons. 7

(3) Make a permanent stained preparation of the given material. Show it to the Examiner. 5

(4) Identify the specimens 1 to 5 as per instructions : 12

Sp. 1 Identify, describe and state its importance.

Sp. 2 Identify, describe and state its uses.

Sp. 3 Identify, describe its pathogeneeity or control.

Sp. 4 Identify, describe its adaptation with reference to its habitat.

Sp. 5 Identify, describe its adaptation with reference to its habitat.

Sp. 6 Identify and describe.

(5) Journal 4

Practical I : Details

N.B.— 1 & 2 : Slides and Specimens.

Sp. 3 : Slides of Plasmodium, Liverfluke, Leech.

Sp. 4 : Cytology as per syllabus (Charts and Models).

Sp. 5 : Genetic chart.

Practical II : Details

N.B.— Sp. 1 : Taxonomy.

Sp. 2 : Taxonomy.

Sp. 3 : Histological structure.

Sp. 4 : Stage of development of Amphioxus.

Sp. 5 : Comparative Anatomy.

Practical III : Details

N.B.— Sp. 1 : Nets & Boats & fish by-products.

Sp. 2 : Models or charts of Poultry houses, equipments.

Sp. 3 : Parasites.

Sp. 4 : Ecological adaptation.

Sp. 5 : Ecological adaptation.

Sp. 6 : Pest.

Genetic Problems

Solve the genetic problem giving explantion :

Cytoplasmic Inheritance :

(Ex) A dextral snail produces only sinistral Progeny when self crossed.

(i) determine its genotype

(ii) determine the genotype of its parents.

Solution : (i) Dd. (ii) Female sinistral (dd).

(Ex) A paramaecium KK with Kappa particles conjugates with a KK paramoecium.

Give the percentage of the autogamous products possessing Kappa if they

(i) Conjugate without cytoplasmic exchange

(ii) Conjugate with an exchange of cytoplasm.

Solution : (i) 50% with Kappa particle (ii) All with Kappa particles.

(Ex) A pure sinistral female snail is crossed with a pure dextral male. Give the appearance of the F_1 with reasons of each instance. Give the phenotype of F_2 when F_1 is self crossed and phenotype of F_3 if F_2 snails are self fertilized.

Solution : F_1-Sinistral, F_2-All dextral, F_3-3 dextral : 1 Sinistral.

(Ex) In snails of the genus Limnea coiling is transmitted as a maternal effect.

(a) Give the phenotypes that could be associated with the following genotypes in individual snail and give the reasons for each answer $S^+ S^+$, SS^+ and SS.

(b) What might be said about the female and male parants and grandparants of snail represented by each of the three genotypes ?

Solution : (a) All are dextral or Sinistral (b) An SS mother sinistral progeny. No effect of male trait.

(Ex) Diagram a cross between a female snail dextral coiling and the genotype $S^+ S^+$ and an inbred SS male with sinistral coiling. Carry the cross to the F_2 and represent the expected results from inbreeding each of the F_2 Snails. Explain the results.

Solution : 3 dextral : 1 Sinistral.

(Ex) If a heterozygous Walnut combed chick is mated with a single combed chicken. What will the offspring be like ?

Solution : 1 Walnut, Rose, Pea, Single type.

(Ex) Rose comb chickens mated with walnut comb chickens and these produced 15 Walnut, 14 Rose, 5 Pea and 6 Single comb chicks. Determine the genotype of the parents.

Solution : Genotype of Rose comb Rrpp, Genotype of Walnut comb RrPp.

(Ex) In the following crosses in poultry, determine the genotype of the parents :

(i) A rose comb crossed to a Walnut comb produced offsprings in the ratio of 15 walnut, 15 rose, 5 pea, 5 single.

(Solution : Rrpp × RrPp).

(ii) A Walnut comb crossed to a single produces 2/8 walnut, 2/8 Rose, 2/8 pea, 2/8 single

(Solution : RrPp × rrpp)

(iii) A Walnut crossed to a single produces 25% single offsprings.

(Solution : RrPp × rrpp).

(iv) A rose crossed to a pea produces 19 Walnut and 20 rose offsprings.

(Solution : RRpp × rrPp).

(Ex) In Poultry the different comb type have different genotype-Walaut, Rose, Pea and Single comb. Find out genotype of parents

(a) All the offspring have walnut comb.

(b) Walnut and Rose comb in equal numbers.

(c) Walnut and Pea comb are formed in equal proportions.

(d) All four types of combs appear in the offspring.

Solution : (a) RrPp × RRPP. (b) RrPp × RRPP, (c) rrpp × RrPP (d) RrPp × rrpp.

Codominance

(Ex) A Roan bull is bred to three cows. Cow A has the same genotype as the roan bull. Cow B is red and Cow C is white.

What proportion of Roan cows are expected in the offsprings of each group of cows

Solution : (a) Roan bull × Roan cow (1 Red : 2 Roan : 1 White)

(b) Roan bull × Red cow (1 Red : Roan)

(c) Roan bull × White cow (1 Roan : 1 White).

(Ex) *Incomplete Dominance*

A plant *Mirabilis jalapa* with pink flowers is crossed with one having red flowers and other with white flowers. Give the genotype and phenotypic ratio :

Solution : (1) RR & Rr 2 : 2 (2) Rr & rr 2 : 2.

T.Y.B.Sc. ZOOLOGY

(New course from June, 1998)

The syllabus is to be completed by assigning three periods each of 45 minutes duration and one practical of four periods per week.

There will be one paper in written examination of three hours duration and one practical of five hours duration.

Pattern of Examination :

(Theory written) (Ext. 350 marks & Int. 150 marks).

(Practical) (Ext. 175 marks & Int. 75 marks).

Theory (written)	Duration	Marks system External	Internal
Paper VI	3 hours	70	30
Paper VII	3 hours	70	30
Paper VIII	3 hours	70	30
Paper IX	3 hours	70	30
Paper X	3 hours	70	30
Practical I (Based on paper VI)	5 hours	45	
Practical II (Based on paper VII & VIII)	5 hours	40	
Practical III (Based on paper VII & IX)	5 hours	40	
Practical IV (Based on paper VII & X)	5 hours	50	

Paper VI : Biochemistry and Animal Physiology

Biochemistry : An elementary knowledge of carbohydrates, proteins, lipids and enzymes.

Carbohydrates : Introduction, classification and importance of carbohydrates.

1. *Monosaccharides* : General structure, definition, nomenclature and classification Asymmetry, Isomerism and Mutarotation

   Properties : Physical, Chemical –

   (i) Reactions with alcohol group

   (ii) Esterification

   (iii) Etherification

   (iv) Reactions involving both OH & CHO/CO groups.

   (a) Oxidation : Sugar acids. Oxidation with metal hydroxides.

   (b) Reduction : Reduction with sodium amalgam.
   Reduction with strong mineral acids
   Reduction with dilute alkalis.

   (v) Osazone test : Reaction with phenyl hydrazine.

   Importance of monosaccharides.

2. *Oligosaccharides* : Definition and classification :

   Disaccharides-Occurrence formation and structure of maltose, lactose, cellobiose and sucrose

   Properties : Importance of disaccharides.

3. *Polysaccharides* : Definition and classification Homopolysaccharides - starch, glycogen, cellulose, chitin Heteropolysaccharides - Mucopolysaccharides.

   Properties : Physical and Chemical Importance of Polysaccharides.

   Proteins : Introduction and definition :

   Amino acids : Structure, classification (on the basis of the composition of the side chains or R group) and properties.

   Peptides : Peptide formation, naming of peptide chain and properties.

   Protein structure : Chemical bond (1) Primary - peptide bonds (2) Secondary - (i) Disulfide (ii) Hydrogen (iii) Hydrophobic (iv) Ionic

Protein configuration :

(1) Primary structure : aminoacid sequence

(2) Secondary structure : helix formation (only α - helix)

(3) Tertiary structure : folding of the chain

(4) Quarternary structure : Protein - Protein inter-actions.

Classification of Protein :

Properties : Physical - Colour and tests, shape and size, molecular weight, colloidal nature, denaturation, amphoteric nature, solubility, optical activity.

Chemical - (a) hydrolysis

(b) Reactions involving COOH group

(i) Salt formation (ii) Esterification

(c) Reactions involving NH_2 group

(i) Salt formation (ii) Reaction with formaldehyde

(d) Reaction involving (R) group

(i) Biuret test (ii) Xanthoproteic test (iii) Milton's test.

Importance of Proteins :

Lipids : Introduction and definition :

Components : (a) Alcohols diff. types (b) Fatty acids - nomenclature Types, saturated : Butyric, Palmitic, stearic Unsaturated : Crotonic, Oleic.

Classification of Lipids :

(a) Simple : (i) Triglycerides-Fats & Oils (ii) Waxes (Formula not required)

(b) Compound or Complex : Phospholipids : (i) Lecithins (ii) Cephalins (iii) Plasmalogens Glycolipids

(c) Derived lipid steroids (Formulae not required) - Basic steroid nucleus.

Properties of Lipids :

(1) Physical : Colour, odour, taste, solubility, melting point, specific gravity, isomerism, insulation, emulsification, surface tension.

(2) Chemical : Hydrolysis, saponification, Hydrolytic rancidity Hydrogenation, Halogenation. Oxidative rancidity.

Biological importance of lipids.

Enzymes : Introduction, definition and chemical nature

Nomenclature and classification

Properties of enzymes

Mechanism of enzyme action

Factors affecting enzyme activity

Enzyme inhibition.

Physiology :

Metabolism : Introduction - general account.

Carbohydrate metabolism : Glycogenesis, Glucogenesis, Gluconeogenesis, Glycogenolysis, Glycolysis (EM-pathway) HMP shunt, Krebs cycle, Oxidative phosphorylation (ETS or Biological Oxidation), Hormonal control of carbohydrate metabolism.

Protein metabolism : Deamination, Transamination, Decarboxylation, Urea formation (ornithine cycle), Hormonal control of protein metabolism.

Lipid metabolism : Glycerol metabolism, Fatty acid metabolism synthesis and lysis by B-oxidation, Hormonal control of lipid metabolism.

Physiology :

1. Physiology of movements : (i) Amoeboid movement (ii) Ciliary movement (iii) Muscle contraction - Functional architecture and chemical constitution of skeletal muscle; Biophysical and Biochemical events in muscle contraction; Sliding-Filament theory, Energetics.
2. Physiology of Nervous System : (i) Structure and types of nervous (ii) Functional properties of nerve fibre (iii) Physiology of transmission of nerve impulse through nerve fibre (iv) Functional properties of synapse (v) Mechanism of transmission from cell to cell.
3. Physiology of reproduction : (i) Role of male sex hormones in mammals (ii) Role of female sex hormones in mammals (i.e. sexual cycles - estrous and menstrual cycles).
4. Physiology of endocrine glands : Definition, Chemical nature and kinds of hormones, Mechanism of hormone action.

   Regulation of hormone secretion, Endocrine

   Glands in vertebrates : Hypothalamus, Pituitary, pineal, Thyroid, parathyroid, Islets of Langerhans, adrenal gastrointestinal hormones, Testis and ovary.

Paper VII : Cytology, Genetics and Embryology

Cytology . Tools and Techniques .

1. Light microscopes
2. Electron microscope
3. Fluorescence microscope
4. Phase-contrast microscope
5. Paper chromatography
6. Paper electrophoresis
7. Centrifugation
8. DNA Staining

Study of ultrastructure of cell organelles :

1. Lysosomes
2. Peroxisomes
3. Cytoskeleton
4. Nucleus, Nuclear membrane, Nucleolus
5. Chromosomes :
   (i) Polycentric, dicentric, acentric (ii) Karyotypes (iii) Supernumerary chromosomes (iv) Heterochromatin & Euchromatin (v) Chromosome models (vi) Chromosome proteins (vii) Giant chromosomes
6. Cell cycle and its regulation, regulation of cell division.

Genetics :

1. Linkage and crossing over
2. Chromosome maps
3. Sex-determination
4. Sex-linked and sex-influenced inheritance
5. Chromosomes and diseases
6. [illegible]
   (i) Overlapping genes (ii) Jumping genes (iii) Split genes (iv) Recombination.
7. Chemical basis of inheritance (Molecular Biology)
   (1) Evidence of genetic material
   (i) Transformation (a) Griffith's experiment (b) Avery's experiment
   (ii) Transduction
   (2) Molecular structure of gene
   (3) Genetic code Essential features of genetic code, Degeneracy of genetic code, Chain initiation and chain termination codon.

Embryology . Study and development of Chick upto 72 Hours :

1. Fertilization, Cleavage, Blastulation, Gastrulation and formation of germ layers.
2. Structure of 24 hours Chick.
3. Structure of Chick between 33-38 hours of incubation only;
   (i) Divisions of the Brain and Neuromeric structure (ii) Formation of Heart.
4. Changes between 38-50 hours of Incubation only;
   (i) Flexation and torsion (ii) Beginning of the circulation of blood.
5. Extra-embryonic Membranes
6. Structure of Chick from 50-72 hours of incubation only; Development of Brain and Heart of Chick.

Paper VIII : Non-Chordates :

Taxonomy of non-chordates upto classes.

Study of following minor phyla : Phoronida and Hemichordata.

Organisation and Functional anatomy of the following types : In addition to those of Paper III. Monocystis, Leucosolenia, Obelia, Planaria, Scorpion, Sepia and Starfish.

Symmetry and Evolution of Bilateria

Evolution and significance of the coelom including theories

Evolution and significance of metamerism including theories

General topics from invertebrate phyla.

Phylum *Protozoa* [illegible] Osmoregulation (2) Nucleus (3) Economic importance
Phylum *Porifera* [illegible] canal system (2) Skeleton (3) Reproduction
Phylum *Coelenterata* [illegible] Polymorphism
Phylum *Platyhelminthes* [illegible] (1) Parasitism
Phylum *Aschelminthes* : (1) Economic importance
[illegible] of Polychaeta [illegible]
Phylum *Arthropoda* (1) Respiratory organs (2) Crustacean larvae [illegible]
Phylum *Mollusca* (1) Shell (2) Foot (3) Torsion and Detorsion
Phylum *Echinodermata* (1) Water vascular system (2) Larval forms

Paper [illegible] and Histology

[illegible] organisation
[illegible] systematics of chordates
[illegible] of the following types [illegible]
[illegible] Pigeon and Rat
[illegible] position and relationship
[illegible] account and affinity
[illegible] (2) Accessory respiratory organs (3) Dipnoi
[illegible] (1) Origin (2) Unsuccessful terrestrial vertebrates [illegible]
[illegible] (2) [illegible] tissue (vacuoles) (3) [illegible]
[illegible] Migration (4) Bird [illegible]
[illegible] structure) (1) Hypothalamus [illegible]

[illegible] protozoa, etc

[illegible] Aerated Lagoon

(2) Fruits : Mango

(3) Stored Grains (i) Rice weevil (ii) Flour beetle (iii) Indian meal moth (iv) Pulse beetle

(4) Apiculture

(5) Sericulture

Fisheries : (1) Marine fisheries of Gujarat :

(i) Mariculture with ref. to prawn

(ii) Pomphret fishery

(iii) Pearl fishery

(iv) Fish culture in fresh water (a) Induced breeding

(b) Management of nursery pond

(v) Fish by - products

(vi) Methods of preservation and processing.

Radiation and Mankind :

(1) Types of radiations

(2) Useful radiation

(3) Hazards of radiations.

Cancer and Mankind :

(1) Types

(2) Morphology and biochemical aspect of cancer

(3) Cancer therapy.

Biotechnology :

(1) Biotechnology in relation to animal and human welfare

(2) Tissue culture

(3) Immuno technology - AIDS

(4) Role of biotechnology in medicine.

Wild life : Wildlife (Conservation and Management)

Introduction to Wildlife . Following topics to be taught :

(a) What is wildlife ?

(b) Causes of wildlife depletion, importance of its conservation, Wildlife Protection Act, [illegible]

(c) Introduction to National Parks (NP) and Sanctuaries(s) with special reference to (1) Ghana (Bharatpur) (2) Sundarvan (Tiger reserve) (3) Gir N P & Gir S. and (4) Marine NP & S

2 Some important National Parks (NP), Sanctuaries, and conservation Projects. (Elementary knowledge only).

(a) Dudhara N.P (b) Dalma S. (c) Dachigam N.P. (Kashmir) (d) Bandipur N.P. (Madhumalai) (e) Kanha N.P. (f) Ghana (Bharatpur) S. & N.P. (g) Sundarbans Tiger Reserve (h) Corbet Park (U.P.) (i) Kaziranga (j) Perivar S.

Projects : (i) Project Tiger (ii) Gir Lion Sanctuary project (iii) Musk Deer project.

3 Some National Parks and Sanctuaries of Gujarat :

(a) Gir N.P. & S. (b) Velavedar N.P. (c) Marine N.P. & S. (d) Vansda N.P. (e) Wildasa S (f) Ratanmahal sloth bear S. (g) Hingolgadi Nature Education S (h) Khijadia bird S. (i) Nalsarovar Bird S.

4 Wildlife Management .

(a) Process of Wildlife Managemant (b) Tools and Techniques for Wildlife Management.

Practicals :

Practical - I as based on Paper VI

Practical - II as based on Paper VII and VIII

Practical - III as based on Paper VII and IX

Practical - IV as based on Paper VII and X.

It is considered compulsory/mandatory to study the animal in their habitats. Hence one [illegible] be arranged for studying various habitats, adaptations and characteristics fauna in [illegible] and other regions of the country.

[illegible] observations made by the candidates during the tour will be recorded in the relevant [illegible] journals

The candidate will record the observation relating to Practical and these will be signed periodically by a member of the laboratory staff.

The candidate will have to produce a certificate from the senior member in Zoology as well as head of the Dept. that he/she has carried out the experiment satisfactorily.

The candidate shall prepare at least 25 permanent preparation and submit these at the time of examination.

The journal as well as permanent preparation will be produced at the time of examination, and these shall be taken into consideration while assigning the marks.

Practical I - (Based on Paper VI)

Biochemistry and Animal Physiology

(1) *Detection of carbohydrates and proteins* : Glucose, Fructose, Lactose, Miltose, Sucrose, Albumin & casein.

(2) *Estimation (Colorimetric)* : (a) Estimation of Proteins (b) Estimation of Glucose.

(3) *Preparation of Atomic models* : Glucose, Fructose, Galactose, Maltose, Lactose, Sucrose, Valine, Threonine, Protein, Glycine, alanine, Glycerol.

(4) *Physiology of movements* :

(a) Mounting of ciliated epithelium of frog to show the ciliary movement.

(b) Recording the normal cardiac cycle of frog.

(c) Perfusion of frog's hear (excised condition).

(d) Study of Muscle-nerve preparation.

(5) *Haematology* :

(a) Total RBC count in human blood.

(b) Total WBC count in human blood.

(c) Estimation of Haemoglobin in human blood.

(6) *Identification* :

(i) With reference to mammalian physiology :

(a) Pituitary gland

(b) Thyroid gland

(c) Adrenal gland

(d) Isleets of Langerhans

(e) Leydig cells in testis.

(f) Corpus luteum in ovary.

(ii) Study by charts/slides :

(a) Menstrual cycle, Estrous cycle (Slides)

(b) Osazone test

(c) Instruments - Kymograph - Haemometer - Haemocytometer

(d) Types of Synapse

(e) Types of Neuron - functional - structural

(f) HMP - Shunt

(g) Urea formation

(h) [illegible] oxidation of fats

Practical II* (Based on Paper VII & VIII)

Nonchordates and Cytology :

(1) Taxonomy : Classification upto classes :

Protozoa : In addition to those of Paper III, monocystis, Trypanosoma, Stentor

Porifera : Animals as per Paper III [illegible] Euplectella, Grantia, Leucosolenia

Coelenterata : In addition to those of Paper III, Valella, Porpita, Pennetula, Ephyra larva, Favia, Pleurobranchia

Platyhelminthes and Nemathelminthes : Animals as per Paper III.

Annelida : In addition to those of Paper III Chaetopterus, Heteronereis, Serpula, Arenicola.

Arthoropoda : Animals as per Paper III - Lepas, Sacculina.

Mollusca : In addition to Paper III, Haliotis, Loligo, Teredo, Nautilus

Echinoderms : As per Paper III.

Slides and specimens : Spicules, gemmules; V. S. of compound eye.

(2) **Diversities of Life : (In addition to Practical - I of S.Y.B.Sc.)** Digestive, circulatory, Reproductive and Nervous systems.

(1) *Scorpion* : Dissection for digestive, circulatory, Reproductive and Nervous systems. Mountings of Pecten and Book-lungs, Poison glands with sting.

(2) *Sepia* : Dissection for digestive, reproductive and Nervous systems, Mountings of jaws, statocyst and spermatophore.

(3) *Starfish* : Dissection for digestive and water vascular system.

Permanent slides : T S. of arm and Larvae.

(4) *Flat form* : T. S. of planaria, Crustacean larvae

(5) *Permanent slides* : L. S. Balanoglossus, T. S. through Proboscis Collar and Branchial regions.

(3) [illegible]ology :

Staining : Mitosis - Onion root - tip (stages of mitosis) Meiosis (Grass-hopper [illegible] chromosomes (Drosophila). Neuro-secretory granules.

[illegible] : Human Karyotype (normal)

Charts : (i) Tools and techniques (ii) Nucleus (iii) Cell organelles (according to therapy).

Practical III - (Based on Paper VII & IX)

Chordates, Histology and Genetics :

(1) **Taxonomy** : Classification upto orders. In addition to Paper IV :

[illegible], Ascidian, Hag-fish Protopterus, Porpoise or Dolphin

[illegible] models or charts :

[illegible] accessory respiratory organs in fishes, Mid-wife toad, Mesozoic reptiles

(2) [illegible] Life :

(a) Frog : Dissection of Digestive, Arterial, Venous, Urinogential systems, Cranial nervous Vth, VIIth, IXth & X, sympathetic nervous system, Brain Hyoid apparatus [illegible] of : Squamous epithelium, Areolar connective tissue, Hyaline cartilage, [illegible] muscle. Medullated nerve fibre.

[illegible] section for digestive, arterial, venouus, Urinogenital system and Brain. [illegible] of Blood.

[illegible] (Vth, VIIth, IXth & Xth) and mounting of membranous [illegible]

(3) Histology :

(a) Permanent slides : Permanent slides of T.S. of mammalian testis, ovary, Pituitary [illegible], Thyroid gland, Adrenal gland.

(b) Preparation of Permanent slides for submission work (minimum 15 slides of which 7 slides should be of histology).

(4) Genetics : Charts/Models of :

(a) Linkage and crossing over

(b) Sex-determinations in Drosophila and Man

(c) Sex-linked inheritance

(d) Sex-influenced inheritance

(e) Gene concept

(f) Griffith's expt.

(g) [illegible]'s expt.

(5) [illegible] problems

Practical - IV (Based on Paper VII & X)

Applied Biology and Mankind, Embryology :

(1) Pollution : Charts

(2) **Applied Entomology :**

(a) Identification of the following pests : Stem borer, White grub, Mango hopper, Aphids, White ant, (Termite), Rice Weevil, Flour beetle, Indian meal moth, Pulse beetle.

(b) Biological control of pests by Lady Bird Beetle. (Chart).

(3) [illegible]ries :

(a) Identification and classification (upto families) of the following fishes : Pomfret (Black [illegible]), Bombay Duck, Ghol, Dara, Hilsa, Catla, Mrigal, Rohu, *Shark*, Ray fish,

Flat fish, Ophiocephalus.

(b) Life-cycle of prawn (Larvae only).

(c) Visit to Freshwater and Marine Fishery centre.

(4) **Poultry Science :**

(a) Identification of abnormal eggs - soft-shelled, double-yolked and egg in egg.

(b) Anatomy of Poultry bird

— Digestive system }

— Reproductive system } demonstrations

(c) Visit to Poultry farm.

(5) **Apiculture :**

Chart of : (a) Social organization in Honey bee. (b) Life history.

Specimen : Bee hive/Honey comb.

(6) **Sericulture :**

Charts of - Life history of silkworm.

Specimen - Cocoon, silkworm.

(7) **Wildlife :**

(a) Visit of Sanctuary

(b) Study of wildlife by charts/models.

(c) Tools and techniques - charts/models.

(8) **Chick Embryology :**

(a) Temporary preparation of mounting of chick embryo incubated for 24 hrs. 33-38 hrs, and 38 to 40 hrs.

(b) Study of permanent slides of whole mounts as well as T.S. of chick embryo passing through various regions to understand heart formation, Neurulation, etc.

Genetics Problems :

Solve the genetic problems giving explanation :

Ex. 1. In man, haemophilia is sex-linked and recessive, what offspring phenotypic ratio would be expected from a marriage between :

(a) A haemophilic man and carrier female.

(b) A normal man and a carrier woman.

Solution : (a) One haemphilic female, one haemophilic male and one normal daughter and one normal son. (b) as (a).

Ex 2. Suppose a young lady comes to you for advice, she tells you that her brother has haemophilia but both her parents are normal. She wishes to marry a man who has no history of haemophilia in his family and wants to know the probability of her children having this diseases. What would you tell her and what is conclusion.

Solution : 50% changes of bearing haemophilic son if she is carrier. If she is normal all sons and daughters will be normal.

Ex 3. A colour blind child with Turner's syndrome has both the parents with normal colour vision. Give the genotype of child and each parents. Explain the inheritance pattern.

Solution : XX^C Mother, Father XY, Child X^CO

$XX^C \times XY$

XX X^CX XXY X^CO Colour blind Turner syndrome.

[Normal]

Ex. 4. A cock feathered male is mated to a female and produces 12 chickens in the ratio of 5-henfeathered males, 6 hen feathered females, and one cock feathered male. Give the most probable genotype of the parental female.

Solution : Genotype of female parent - Hh.

Ex. 5 From a marriage, all the daughters are normal sighted whereas all the sons are colourblind. Give the genotype of the parents. If both the parents were colourblind, could they give rise to normal children ?

Solution : Mother X^CX^C and father XY.

Ex. 6. In Drosophila, if a homozygous red eyed female is crossed with a white eyed male and if F_1 female from this cross is mated with her father and F_1 male with his mother, what will be the appearance of the offspring of these two crosses as to eye colour ?

Solution : (i) 50% Red and 50% white eyed male and female. (ii) All are red eyed.

Ex. 7. In poultry if a nonbarred cock is crossed with a barred hen and an F_1 female from this cross is mated with her father and F_1 male with his mother, what will be the appearance of offspring of these crosses as to barring ?

Solution : (i) All are nonbarred. (ii) All males are barred, 50% nonbarred and 50% barred females.

Ex. 8. In Drosophila if a white eyed female is crosses with a red eyed male and if an F_1 female from this cross is mated with her father and F_1 male with his mother, what will be appereance as to eye colour of the offstping of these last two crosses ?

Solution : (a) All females are red eyed, 50% red eyed male and 50% white eyed female. (ii) All are white - eyed Drosophila.

Ex. 9. A man and woman, both of normal vision have (1) a colour blind son who has a daughter of normal vision, (2) a daughter of normal vision who has one colour-blind and one normal son and (3) another daughter of normal vision who has five normal sons. What are the genotypes of parent, children and grandchildren ?

Solution : Genotype of parents X^CX mother, XY father, children (1) X^CX (3) XX Grandchildren (1) XX^C (2) X^CY and XY (3) all with XY.

Ex. 10. A man's maternal grandmother had normal vision, his maternal grandfather was colourblind, his mother is colourblind, his father is of normal vision; what are the genotype, as to vision, of the two parents and grandparents mentioned ? What type of vision has this man himself ? What type have sisters ?

Solution : Genotype — Parents - X^CX^C and XY — Grandparents - XX^C and X^CY —Man himself - X^CY — Sister - XX^C (All are carrier).

Ex. 11. A bolandric is known in humans which causes long hair to grow on the external ears. When men with hairy ears marry normal women :

(a) What percentage of their sons would be expected to have hairy ears.

(b) What proportion of the daughters are expected to show the trait.

(c) What ratio of hairy eared, normal children is expected ?

Answer : (a) 100% (b) None, (c) 1 hairy : 1 normal.

Genetic Problems—Linkage and crossing over :

Ex. 1. An individual heterozygous for four gene pairs AaBbCcDd was testcrossed to aabbccdd and 1000 progeny were classified as follows :

aBCD	—	42	ABcD
Abcd	—	43	AbcD - 6
ABCd	—	140	AbCd - 9
abcD	—	145	ABcd - 305
			abCD - 310

(a) Which gene pairs are linked ?

(b) If two pure breeding lines were crossed to produce the heterozygous individual, what were their genotypes ?

(c) Draw a linkage map of the linked genes showing their order and their distance spart in map units.

Solution :(a) B Ad . C

b aD C

(b) AABBccdd × aabbCCDD

(c) 10mu ←50mu→

B/b A/a D/d C/c

Ex. 2. A female animal with genotype AaBb is crossed with a double recessive male aabb. Their progeny include

442 AaBb

458 aaabb

54 aaBb

Explain these results.

Solution : Two genes are linked 10 map units apart. The female parent was of the type AB/ab.

Ex. 3. Construct a map of a chromosome given the following map distance between individual pairs of genes.

r –	c	10 units	–10
C–	P	12 ,,	12
P –	r	3 ,,	03
S –	C	16 ,,	16
S –	r	8 ,,	08

Answer : Linear arrangement of series in a chromosome is

S P r C

Ex. 4. In maize three genes are linked in one chromosome, Assume one parent is dominant for all three genes, the other recessive. In test cross the following numbers were obtained.

ABC – 225	ABC – 144
abc – 245	abc – 156
aBc – 98	aBC – 14
AbC – 102	Abc – 16

Total 1000

(a) Arrange the series in the correct linear order.

(b) What is the crossing over percentage ?

(c) Is there interference ?

(d) What is coefficient of coincidence ?

Answer : (a) CAB

(b) Double crossing over, Percentage between 1 and 2 = 3%

(c) There is interference.

(d) Co-efficient of codominance 0.4.

Ex. 5. Assume that an individual homozygous for ± ± is crossed with one homozygous for *a b* and that the F_2 from this cross is as follows :

+ + 334

+b 37

+a 38

ab 87

Is this result different from that which you would expect if segregation of *a* and *b* were independant ?

IF so, what is the recombination rate due to crossing over ?

Answer : (1) Yes - Here phenomenon of linkage has occured. (2) 15% crossing over percentage.

Ex. 6. In rabbit two recessive genes produce a solid body colour and long hair respectively in constrast to a spotted body colour and short hair, which result from the dominant alleles.

The results from a cross between the heterozygous spotted short haired rabbit and solid long haired rabbits are as follows :

Spotted short 48

Spotted long 05

Solid short 07

Solid long 40

In terms of crossover units, how far apart are these two genes on the chromosome?

In terms of crossover units, how far apart are these two genes on the chromosome.

Solution : These two genes are *12 units* apart on the chromosome.

Ex. 7. In rabbit black and short hair are characters resulting from two dominant genes. The receive alleles of these genes produce brown and long hair. When we mate homozygous black, short haired with brown, long haired rabbits and test cross the offspring we obtain the following results :

Black short haired – 29
brown long haired – 33
black long haired – 35
Brown short haired – 27

From these results, would you conclude that these genes are located on the same chromosome ? Why ? If your answer is 'yes' what is the percentage of crossing over?

Answer : (1) These two genes are located on the same chromosome. Out of 124 offspring - 62 offspring are recombinants due to crossing over between black-short and brown-long haired. (2) 50% crossing over.

Ex. 8. Sex - influenced genes.

(1) Early baldness in man is due to an autosomal gene and is dominant in males. The homozygous recessive results in late baldness or non-baldness. The heterozygous persons marry and beget childrens.

(a) What are the phenotype of the male and female parents.
(b) What will be the phenotypic ratio among male children.
(c) What will be the phenotypic ratio among the female children ?

Solution :(a) Male bald and female notbald. (b) Phenotypic ratio among male is Bald 3:1 notbald.(c) Phenotypic ratio among female is Bald 1:3 notbald.

Ex 9. A sex-linked recessive gene in human produces colour blind men when hemizygous and colour-blind women when honozygous. A sex-influenced gene for pattern baldness is dominant in men and recessive in women. A heterozygous bald, colour blind man marries a non-bald woman with normal vision whose father was non-bald and colour blind and whose mother was bald with normal vision. List the phenotypic expectation for their children.

Answer : Phenotype	Daughters	Sons
Bald, normal vision	1/8	3/8
Bald, colour blind	1/8	3/8
nonbald-normal vision	3/8	1/8
nonbald-colour blind	3/8	1/8

Sex-determination :

Ex. 10. It is sometimes possible to produce tetraploid Drosophila. What would be the sex of the following ?

(a) AAAA plus XXXY
(b) AAAA plus XXYY
(c) AAAA plus XXXX
(d) AAAA plus XY

Solution : (a) 0.75 Intersex (b) 0.5 Male (c) 1.0 Normal female (d) dies.

Ex. 11. Sex-limited gene. If a cross produces an F_1 progeny in the ratio of 3 hen feaathering: 1 Cock feathering and 1/3 of hen feathering, progeny is males, give the phenotype of the parents.

Answer : Hhzz and hhZw.

Practical I - (Based on Paper VI)

Date :] *Time :* *Total marks : 45*

1. Detect any two constituents from the given solution. 6

OR

1. Estimate the concentration of Protein/Glucose by colorimetric method. 6
2. Prepare the atomic model of ————and show it to the examiner. 7
3. Perform the given physiological experiment————and show it to the examiner. 9
4. (a) Count the R.B.C./W.B.C. from your own blood. 7

OR

(a) Estimate the haemoglobin percentage from your own blood. 7
(b) Make a temporary preparation of ciliated epithelium. 4

5. *Identify as per instructions :* 8
   (1) Identify and describe (Endocrine glands).
   (2) Identify and describe (Neurons and Synapse).
   (3) Identify and explain (HMP Shunt, Urea formation, β-Oxidation).
   (4) Identify and describe (Menstrual cycle/Estrous cycle).
6. Journal. 4

Practical II : (Based on Papers VII & VIII)

Date :] Time : Total marks : 40

1. Dissect the given animal————so as to expose ————and show it to the examiner. 10
2. Make a temporary preparation of ————from the given animal —— . Stain if necessary and show it to examiner. 4
3. Expose ——— from the given animal ————and show it to the examiner. 6
4. Make a temporary stained preparation of ———and show it to the examiner. 6

OR

4. Perform the DNA staining from the given slide. 6
5. *Identification as per instructions :* 10
   1-2. Identify and classify upto classes giving reasons.
   3. Identify and describe (Taxonomy and Diversities of Life).
   4. Identify and describe (Charts of Tools and techniques).
   5. Identify and describe (Cell organelles).
6. Journal. 6

Practical III : (Based On Papers IX & Genetics of Paper VII)

[Date :] Time : Total marks : 40

1. Dissect the given animal —— so as to expose ——, show it to the examiner. 8
2. Make a temporary preparation of —— from the given animal ——. Stain if necessary and show it to the examiner. 3
3. Expose ————from the given animal———and show it to the examiner. 5
4. Make a permanent stained preparation of the given material and show it to the examiner. 5
5. Solve the given Genetic problem. 5
6. Identifications as per instructions : 10
   (1) and (2) Identify and classify upto order giving reason.
   (3) Identification and describe (Specimens; Models or Charts).
   (4) Identify and describe (Histology)
   (5) Identify and describe (Genetics).
7. Journal. 4

Practical IV : Based on Paper VII)

[Date :] Time : Total marks : 50

1. Make a permanent stained preparation of the chick embryo. Show it to the Examiner. 7
2. Identify and classify upto families, the given fishes giving reasons. 7
3. Submission. 8
4. Viva-Voce. 10
5. *Idebtification as per instructions :* 14
   (1) Identify and comment (Fisheries)
   (2) Identify and describe (Pollution)
   (3) Identify and comment (Poultry science)
   (4) Identify and comment (Apiculture, Sericulture)
   (5) Identify and describe (Wildlife)
   (6) Identify and describe (Embryology)
   (7) Identify and Describe (Applied Entomology).
6. Journal. 4

પરિશિષ્ટ 'પ'

કામકાજ ક્રમાંક ૨(પ)

New Syllabus S.Y.B.A./S.Y.B.Sc. Mathematics

(In force from June, 1997)

Paper III : Calculaus : 4 Lectures + 1 Tutorial
Paper IV : Linear Algebra : 4 Lectures + 1 Tutorial
Paper V : Numerical Analysis : 3 Lectures + 1 Practical
(One practical of : 3 lectures Batch of 20 students)

OR

Paper V : Computer Oriented Numerical Analysis : 3 Lectures + 1 practical
(One practical of 3 lectures Batch of 10 students)
Requirement of basic facility. One computer for two students.

Paper III : Mathematics

Unit 1 : Real functions of several variables, their limit and continuity (Repeated limits and limits in R^2 to be explained), Partial derivatives for functions of n variables (for special case $n = 2$ notation D12, D21 to be explained), Differentiability, chain rule, partial derivatives of higher order, condition for commutativity of variables in higher order partial derivatives, Darivatives of implicit functions.

Units 2 : Euler's theorems on partial derivatives of homogeneous functions. Extrema of functions of several variables, Lagrange's method of undermined multipliers. Taylor's and Maclaurin's expansions for functions of several variables (Proof for case of two variables only).

Unit 3 : Differentiation along a curve, Applications to geometry
(i) Curvature in Cortesian and Polat co-ordinates
(ii) Singular points for plane curves espacially points on inflexion and double points.
(iii) Tangent line and normal planes to curve
(iv) Tangent planes and normal to surfaces
(v) Gradient

Unit 4 : Upper and lower integrals of bounded functions over a closed interval (a, b), intograble functions, properties of integrable functions, class of integrable functions (i.e. monotonic, continuous, discontinuous with finite number of points of discontinuity) fundamental theorem of integral calculus, Mean value theorems (both), change of variable.

Unit 5 : (i) Double integral, reported integral, integral on a non-rectangular region, Jacobian (only introduction and use for cartesion to polar and spherical, cylindrical co-ordinates and vice-versa.
(ii) Improper integrals (only definition) beta and gamma functions as improper integrals. their convergence, relations between them, their simple properties and applications.
(iii) Divergence and curl of a vector, line integral, surface integral, Sreen's Gausee' and stock's theorem.

List of reference books

1. Shanti Narayan : Differential calculaus (1980), S. Chands Co., Delhi
2. Shanti Narayan : Integral Calculus (1980), S. Chand & Co. Delhi
3. T. M. Apostol : Calculus Vol. 1, 2, Wiley Eastern Ltd., New Delhi
4. T. M. Apostol : Mathematical Analysis, Addison - Wesley, Tokyo
5. R. G Bartle : Elements of Real Analysis 2nd Edition, Addison - Wesley, New York
6. R. R. Goldberg : Real Analysis, Oxford & IBH Publishing Co., New Delhi
7. T. M. Apostol : Calcujus Vol. 2, Blaisdell International Text Book Series
8. D. V. Widder : Advanced Calculus, Prentice Hall of India, New Delhi
9. W. Kaplan : Advanced Calculus, Addison - Wesley, New York.

Paper IV : Linear Algebra

Prerequisites :
(1) Linear Transformations.
(2) The space LU, (V) and L(V) of linear mappings.

Unit 1 : **Linear Transformations and matrices :** Dimension theorem, Rank-Nullity theorem, Nonsingular linear transformations, Isomorphic vector spaces, Operator equations. Matrix of a linear transformation, L.T. associated with a matrix, L(U, V) is isomorphic to Mm×n and hence to determine the dimension of L(U, V).
Rank and nullity of a matrix, Invertibility of n×n matrices, Types of matrices.
Elementary row operations and row reduction to row canonical form. Application to the solution of a system of linear equations. Discussion of the 3 cases when : (i) there is no solution, (ii) there is a unique solutions. (iii) there are an infinite number of solutions. To find the inverse of a matrix by row reduction. Chance of basis. Similar matrices.

Unit 2 : **Linear functionals and the dual space :** Dual space, dual basis, dual of a dual, annihilators. Bilinear forms, Matrix representation, symmetric and skew symmetric bilinear forms.
Determinants and other invariants of a linear transformation. (Det AB = (Det A) (Det B), similar matrices have the same determinant. Determinant of a L.T., Trace of a matrix, Trace of a L.T.).

Unit 4 : **Eigenvalues and Eigenvectors of a linear transformation :** Eigenvalues and eigenvectors of a linear transformation :
Diagonalisaction and eigenvectors.
Characteristic polynomial. Cayley Hamilton theorem
Minimal polynomial Deductions.

Unit 3 : **Inner Product Vector Spaces :** Inner product vector spaces.
Cauchy Schwarz inequality, angle between two vectors, orthogonality.
Gram-Schmidt's algorithm
Ortho normal basis.
Adjoint of a linear transformation, special linear mappings and matrices.
(Hermition, Unitary, Orthogonal, normal).

Unit 5 : **Spectral Theorem and Applications :** Special theorem for symmetric operaters.
Symmetric real matrices.
Diagonalisation of 2 × 2 and 3 × 3 real matrices. (via orthogonal transformations, pivotal method).

Geometrical applications :
Quadratic forms associated with linear mappings. Identifying quadratic curves in R^2 quadric surfaces in R^3, Full linear group, a fine group of transformations.

References

1. An introduction to Linear Algebra, V. Krishnamurthi et al.
2. Topics in Algebra (I. N. Herstein)
3. Linear Algebra (S. K. Berberian) Oxford University Press
4. Linear Algebra Problem Book (P. R. Halmos) Cambridge University Press
5. Linear Algebra (G. Faria) New Central Book Agency Ltd., Calcutta
6. સુરેખ બીજગણિત : આઈ. એન. હર્સ્ટાઈન, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ.

Paper V-A (Theory) : (Theory of Equations and Numerical Analysis)

Unit 1 : **Methods for solving cubic and bi-quadratic equations :** Relations between roots and co-efficients, transformation of equations, Multiple roots, Cardon's method, Descarte's method, Ferrari method for bi-quadratic equations, Horner's method.

Unit 2 : **Errors in Calculation and Calculus of Finite Differences, Interpolation :** Significant errors, Releative errors, Estimation of errors, Application of error formula, Forward Differences, Backward Differences, Shift operator, Polynomial in factorial notation, Error in interpolation.

Unit 3 : Interpolation and Inverse Interpolation : Central Difference, Gauss's forward and backward formula, Stirling's interpolation formula, Bessel's and Everett's formula, Lagrange's formula, Divided difference, Newton's divided difference formula, Inverse interpolation, Use of inverse interpolation.

Unit 4 : Numerical Differentiation and Intergration : Estimation of error in Differentiation formula based on Newton's forward, backward formulae and Stirling's formula, Differentiation formulae for uniqui-spaced arguments, General Quadrature formula, Trapezodial rule, Simpson's rule, Weddle's rule, Quadrature formula based on Lagrange's formula, Newton - Cotes formula, Numerical intergration formula based on central difference formulae, Euler-Maclaurin sum formula.

Unit 5 : Algebraic and Transcendental equations, Numerical Solution of Differential equation of first order : Graphical method, method of bisection, method of iteration, Newton-Raphson formula, Newton's Interative formula, method of False position, Euler's method, Euler's modified method, Picard's method, Taylor's series method, Ranga - Kutta method, Milne's Method.

Paper V-B : Mathematical Practical :

Unit 1 : *Tracing on curves and Graphical Solutions :*

(1) All trignometric functions and their inverses

(2) All hyperbolic functions and their inverses

(3) Quadratic, cubic, exponential and logarithmic functions

(4) Graphs of $Y = \frac{1}{x}$, $Y = \frac{1}{x}$, $Y = x$, $Y = \frac{x + a}{x - a}$, $\frac{x^2}{a^2} + \frac{Y^2}{b^2} = 1$

(5) Parametic equations Astroid, Ellipse, Hyperbola, Cycloid, parabola

(6) Polar forms : Cardioid Circle, Conic, Spiral, Limacon Leminiscate of Bernoulli.

Unit 2 : *Interpolation and Inverse interpolation :*

(1) Newton's forward and Backward interpolation

(2) Gauss's Stirling's, Bessel's and Everett's interpolations

(3) Lagrange's equal and unequal interpolation

(4) Newton's divided difference interpolation

(5) Inverse interpolations.

Unit 3 : *Numerical Differentiation and Intergration and Solution of Differential equations :*

(1) Numerical differentiation for equi-speed and for unequi-spaced arguments.

(2) Quadrature formula

(3) Picard's and Taylor's method

(4) Euler's Modified Euler and Ranga-Kutta method

(5) Bisection method, method of false position, fixed point interation, Newton-Raphson. Harner's method.

Unit 4 : *System of Linear Algebraic Equations :*

(1) Ellimination method

(2) Inveration of matrin by (a) Inveration of matrin by Row-Reduced E chelon form and (b) Gauss-Seidel Iteration methods.

(3) Eigenvalues and corresponding eigenvectors in three-dimensional space.

(4) Minimum polynomials of 3 × 3 matrice

(5) Canoical and Quadratic forms

(6) Least square method

Reference for practicals : Part II Computational Procedures by Moollah S. A. Chs. 1, 2, 3, 4, 5, 6, 7, 8, 10.

The coursed Units 2, 3, 4, 5 is covered by Chs. 1, 2, 3, 4, 5, 6, 8 of Numerical Analysis and Computational Procedures.

S. A. Moollah, New Central Book Agency (P.) Ltd.
8/1 Chintamoni Das Lane, Calcutta 700 009.

Reference Books

1. Barnard S. & Child J. M. : Algebra, Macmillan, 1985.
2. R. Ghosh & K. C. Maitray : Higher Algebra (Classical and abstract), New Central Book Agency (P.) Ltd., Calcutta.
3. M. Ray & H. S. Sharma : A text book of higher algebra, S. Chand & Co. New Delhi.
4. W. S. Burnside & A. W. Panton : Theory of Equations, S. Chand & Co., New Delhi
5. S. S. Sastry : Elementary Numerical Analysis, Prentice Hall of India, New Delhi
6. J. B. Scarberough : Numerical Mathematical Analysis (6th Ed.), Oxford & IBH Publication, New Delhi
7. K. S. Kunz : Numerical Analysis, McGraw Hill Book Co., New York
8. F. B. Hilderbrand : Numerical Analysis, McGraw Hill, New York.

Paper V-A : Computer Oriented Numerical Analysis :

Unit 1 : 1. Introduction to Personal Computer and Computer Programming.
2. Detailed study of the Programming Language BASIC.

Unit 2 : Error in Calculation and Calculus of finit Difference Interpolation : Significant errors, Relative errors, Estimation of errors, Application of error formula, Forward Differences, Backward Differences, Shift operator, Polynomial in factorial, notation, Error in interpolation.

Unit 3 : Interpolation and Inverse Interpolation : Central Differences, Gauss's forward and backward formula, Stirling's interpolation formula, Bessel's and Everett's formula, Lagrange's formula, Divided differences, Newton's divied difference formula, Inverse interpolation. Use of inverse interpolation.

Unit 4 : Numerical differentation and integration : Estimation of error in Differentation formula based on Newton forward-backward formula and Stirling's formula, Differentiation formulae for unequi-spaced arguments, General Quarature formula, Trapezoidal rule, Simpson's rule, Weddle's rule, Quadrature formula based on Lagrange's formula, Newton-Cotes formula, Numerical integration formula based on central difference formulae, Euler Maclaurin sum formula.

Unit 5 : Algebraic and Transcedental equations, Numerical solution of differential equation of first order. Graphical methods, method of bisection, method of interation, Newton-Raphson formula, Newton's Iterative Formula, method of False position. Euler's method, Euler's modified method, Picard's method, Taylor's series method, Ranga-Kutta method, Milne's method.

The course is covered by Unit 1 by Chs. 1, 2, 4, 5, 6, 7 of Programming with Basic, Byron Guttfriend. (Schaum Outline Series) 3rd Ed. 1988.

Units 2, 3, 4, 5 by Chs. 1, 2, 3, 4, 5, 6, 8 of Numerical Analysis and Computational Procedures S. A. Moollah, New Central Book Agency (P.) Ltd., 8/1, Chitamon Das Lane, Calcutta 700 009.

Reference Books

1. S. S. Sastry : Elementary Numerical Analysis, Prentice Hall of India, New Delhi
2. V. Rajaraman : Computer Oriented Numerical Method, Prentice Hall of India, New Delhi
3. J. B. Scarborough : Numerical Mathematical Analysis (6th ed.), Oxford & IBH Publication, New Delhi
4. K. S. Kunz : Numerical Analysis, McGraw Hill Book Co., New York
5. John H. Mathews : Numerical Method for Mathematics, Science and engineering (1994), Prentice Hall of India Ltd., New Delhi
6. Jain : Numerical Methods for Scientific and Iyerngar. Engineering computation
7. E. Balaguruswamy : Programming in Basic, Tata McGraw Hill, New Delhi
8. Alkis Constantindes : Applied Numerical Methods with Personal Computer. McGraw Hill, New York, 1987.

Paper V-B : Computer Practicals

Binary numbers, Binary shifting, Scientific notation, Machine numbers, Computer Accuracy. Computer Flogting point numbers.

[illegible] To find a solution of [illegible]
[illegible] Method : [illegible] find a root of f(x) [illegible]
3. Method of false position : To find a root of $f(x) = 0$
4. Approximate location roots
Newton Raphson iteration [illegible]
6. Secant Method
7. Steffensen's Acceleration : To quickly find a solution of the fixed point equation [illegible] $g(x)$
8. Muller's Method : To find a solution of $f(x) = 0$, given three distinct initial approximations
9. Non[illegible]seidel iteration To solve a nonlinear fixed point system
Newton [illegible] Method in two dimensions
[illegible] To solve the upper triangular system
[illegible] with Pivoting-Solution of linear system
[illegible]ation and gauss-Seidal iteration
[illegible] of a Taylor series
[illegible] calculus-Synthetic division
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] codes
[illegible]

[illegible] solution of $\frac{dy}{dx} = f(x, y)$

[illegible] Method of order 4
[illegible] Method of order 4
[illegible] Fehlberg Method
[illegible]-Bashforth-Moulton Method
[illegible] method and The hamming Method

Reference Book

[illegible] Mathews : Numerical methods for mathematics, Science and Engineering (1994) [illegible] India Ltd. New Delhi

પરિશિષ્ટ [illegible]

M.Sc. Part I & II

ZOOLOGY (New Course)

(In force from June 1997 for M.Sc. Part I [illegible] June [illegible])

M.Sc. Part I (In force from [illegible])
Paper I : Cell Biology, Genetics [illegible]
Paper II : Animal Diversity and [illegible]
Paper III : Biochemistry and Ph[illegible]
M.Sc. Part II (In force from June [illegible])
Paper IV : Developmental Biology [illegible]
[illegible]
Paper V : Molecular [illegible]
Paper V : [illegible]
[illegible]

... magnetic and particulate.

... Old and new units and their conversions.

... with matter

... radiation : effects on the macromolecules; Cells, tissues, org...

... genesis

... izing agents

...

Radiation ... and precautions.

... of radiation.

... Animal Diversity and Ecology :

... Animal Diversity

... Taxonomy Numerical taxonomy (a) Chemotaxonom...

... molecular characters.

... procedures (a) Taxonomic collections. (b) Curating of collecti...

... various types.

... non-chordates and chordates - Origin, Bionomics, Distribu...

... Adaptations and general organization of non-chordates ...

... distribution of animals and factors influencing dispers...

... regions

... in the past and at present, the extinction of spec...

... anthropogenic pressure on the animal diversity

... density - Absolute and Relative density and

... units. Life Tables and Survivorship curves.

Population growth - Exponential and Logistic and Age distribution.

Population dispersion, dispersal and fluctuations.

Population selection - Life history strategies r and k selection.

Clutch size and sex ratios in populations.

Biotic interactions.

Positive and Negative Interactions.

Protocooperation, Symbiosis, Mutualism, Commensalism, Amensalism, competitio...

Predation and parasitism

(ii) *Adaptations* Various types of adaptation : Desert, Cursorial, Fossorial, Arbor... Volant and aquatic.

Habitat preference of dominant species.

(iii) *Community Ecology* : Community structure and organisation.

Analytical and synthetic characters.

Species diversity, ecological dominants and indicators.

Stratification, Ecotone and Edge effect.

Niche theory, Ecological succession and community stability.

Food chains, food webs and ecological energetics.

The Ecosystem : Classification of ecosystems.

(iv) Primary and secondary production.

Productivity of different ecosystems.

Freshwater Ecosystem : Lentic and Lotic systems : Inland Wetlands.

A brief survey of Indian biomes.

Terrestrial Biomes - Grassland, Tropical forest, Deciduous forest, Coniferous fo... Tundras and Deserts

Marine Biomes - The sea Rocky shores, Sandy shores, Mangrove swamps and mudflats, Estuaries and Coral Reefs.

(v) Biogeochemical cycles and Environmental Degradation : Biogeochemical cycles-Carbon, Phosphorous and Nitrogen.

Influence of human activities on environment.

Industrialization, Deforestation, Pollution - Air & Water.

Environmental Degradation - Ozone depletion, Greenhouse.

Effect, Global warming and Acid rain.

Paper III : Biochemistry and Physiology

Biochemistry : Biomolecules, macromolecules and their monometric constituents, carbohydrates, proteins, lipids, nucleic acids, vitamins; Chemistry of Amino acids-levels of organisation of protein structure, protein synthesis, metabolism of protein and amino acids, urea cycle Enzymes, classification and nomenclature of enzymes, Regulation of enzyme activity, Co-enzymes and Co-factors Isocenzymes, Cellular metabolism-Thermodynamics of cellular reactions, redox potential, Energy rich compounds and their biological significance, Biological oxidation, mitochondrial oxidative phosphorylation, ATP synthesis, Chemoosmotic theory;

Mrtabolic Cycles : The Embden Mayerhoff pathway, Hexose-monophosphate shunt pathway, TCA Cycle, Synthesis of carbohydrates; Metabolism of Lipids-Biosynthesis of fatty acids and triglycerides, oxidation of fatty acids, inter-relationship between carbohydrate and lipid metabolism, Regulation of carbohydrate, lipid metabolisms; Prostaglandins, metabolism of water and minerals, Techniques in analysis of macromolecules-Chromatography, Electrophoresis, Protein fractionation and purification, Sequencing of proteins, Centrifugation, Colorimetry and Spectro-photometry, pH measurement.

Physiology : Structure and physiology of vertebrate muscle skeletal, cardiac, smooth; Physiology of digestion and regulation of digestive secretion in vertebrates; Physiology of blood-structure, haemopoisis, coagulation, Immune mechanism, respiratory pigments, Respiratory function of blood, Heart beat Initiation, Conduction, Regulation, Physiology of Respiration, Exchange and transport of gases; Physiology of vertebrate kidney; Role of vertebrate kidney in body water regulation; Nitrogen excretion patterns in vertebrates and its regulation; Co-ordination of body functions-Chemical co-ordination Hormones, Neurohormones Neurohumours, Endocrine organs and hormonal, regulation in vertebrates, Neural integration-Structure and Physiology of neuron; Excitability of membranes, Electrical and chemical transmission between cells, Conduction in nerves, synapse, physiology of Reproduction, Adaptations to environmental stresses.

M.Sc. Part II

(In force from June, 1998)

Paper IV : Developmental Biology, Animal Behaviour and Evolution

1. **Developmental Biology** : Historical review. Cytophysiology of gametes

- Fertilization - Natural and Artificial, *in vitro* fertilization and embryo transfer

-- Cleavage patterns, Gastrulation, Fate maps and their significance.

-- Embryonic Induction, Inductors, chemical nature of induction

-- Formation of rudimentary organs of chordates Gradients.

-- Gradients

-- Organogenesis

-- *Differentiation and development* Cytological genetical and chemical basis of differentiation and its regulation, Epithelial mesenchymal interaction Embryological develpment of Amphioxus, Frog, Chick and Mammal.

Growth patterns Dynamics of growth, Types: Physiological mechanisms.

Regeneration : In non-chordates and chordates, Factors affecting regeneration: Regeneration fields.

Physiological gradients and polarity concerned with regeneration.

2. **Animal Behaviour :**

1. Introduction of Ethology
2. The sensory world of animals : Behavioural Equipment (Senses, Organs)
3. Patterns of Behaviour (a) Individual behavioural pattern (b) Homing behaviour.
4. Genetics of Behaviour (a) Genetic basis of behaviour (b) Learning behaviour.
5. Evolutionary approach ... behaviour, ... selection.

6. Reproductive behavioural patterns : (a) Courtship and ritual behaviour (b) Mating (c) Parental investment (d) Stickle back behaviour.
7. Social organization : (a) Dominance Hierarchies (b) Social competition (c) Territoriality
8. Individual social interactions : (a) Animal Communications (b) Dance Language of the honey bees (c) Aggregation (d) Social facilitation
9. Comparative aspects of learning : (a) Definition and forms of learning behaviour, Development of learning (b) Mechanisms of learning (c) Imprinting
10. Human ethology - General aspects.

3. **Evolution :**

Concept of Evolution; Origin of Life on Earth;
Origin of prokaryotic and eukaryotic cells;
Sources of evolution.
Variations; Role of Mutations; Recombination, Polyploidy;
Isolation; Natural selection, Evolution in Action;
Species concept and speciation, Molecular phylogeny;
Mimicry; Polymorphism, population Genetics,
Genetic Drift;
Hardy - Weinberg Law;
Tempo of Evolution, Macro and Micro-Evolution.
Evolution of Man
Trends in Evolution
Evolution - Future prospects.

Special Paper V

(1) Molecular Cell Biology, Cytogenetics and Biotechnology

1. **The evolution of the cell :**
   - From molecules to first cell
   - From prokaryotes to Eukaryotes
   - From single cells to multicellular organisms
   - Cell colony, cell adhesion, cell-cell communication, internal environment or homeostasis of cell
2. **Small molecules, Energy and biosynthesis :** Sugars, fatty acids, amino acids and nucleotides.
3. **Macromolecules : Structure, Shape and information :**
   - Protein structure and function
   - Nucleic acids and function.
4. **How cells are studied :**
   - (a) Microscopy : Phase contrast and Fluorescence
     - Special EM Techniques - SKM, High resolution EM.
     - Freeze fracture and freeze etch techniques.
     - Negative staining and cryoelectron microscopy.
     - X-ray diffraction.
     - Immunofluorescence
     - Image Analysis technique.
   - (b) *Cell separation, Fractionation and Culture :*
     - Centrifugation - densisty gradient, differential and ultra-centrifugation.
     - Chromatography - Paper, TLC, HPLC.
     - Electrophoresis - SDS PAGE, 2-D PAGE, Capillary Electrophoresis
     - Cell, tissue and organ culture. Suspension and monolayer cultures.
   - (c) *Study of cell using tracer techniques* with Radioactive isotopes and antibodies.
   - (d) --DNA separation/isolation
     - DNA sequencing
     - Southern and Northern blotting, Western Blotting
     - In-situ hybridization technique.
   - (e) *Other methods* : Flow cytometry.

5. **Molecular organization and functions of :**
   - Plasma membrane
   - Mitochondria
   - Golgi complex
   - Endoplasmic reticulum
   - Ribosomes
   - Lysosomes and disease
   - Peroxisomes
   - Nucleus, Nucleolus
   - Cytoskeleton : Microtubules and Intermediate filaments
   - Cell adhesions and cell junctions.
6. **Dynamics of cell growth and Division :**
   - Cell cycle, Cell division - molecular aspects, mechanics, regulation
   - Cell growth; Growth factors.
7. **Cellular interaction :**
   - Cell - Cell communication, receptor ligand interaction; Signal transduction, role of second messengers and G-proteins.
   - Ion, Calcium channels.
   - Extra and Intra cellular interactions.
   - Cell aggregations.
   - Cell ageing and senescence.

(2) Molecular Endocrinology and Reproductive Physiology

Chemical Nature of hormones :
- Steroid hormones
- Amino acid derived hormones
- Peptide hormones
- Biogenic amines.

Biosynthesis, Storage and Metabolism of hormones : Origin and evolution of hormones.
Homeostasis and feed back regulation of hormones
Mechanism of hormone action
- Membrane bound and intracellular receptors, steroid hormone-receptors, hormone receptor interaction and signal transduction.
- Second messengers in hormone action.
- Role of cyclic nucleotides. C-AMP-Ca^{2+} interaction. Receptopsomes and recycling of receptors.
- Neuro Endocrine integration.
- Role of classic and peptide neuromediators in the neuroendocrine regulation of anterior pituitary hormonal release.
- Hypothalamo - hypophysial complex
- Role of pineal in transduction of environmental cues.
- Neuroendocrine inter-relationships in regulation of seasonal reproduction
- Rhythms in reproduction
- Role of hypothalamus and the higher brain centres.

Extragonandal influences in reproduction :
- Thyroid
- Adrenal
- Prostaglandins.

Hormones of extra endocrine sites :
- GI tract
- Kidney
- Heart
- Lung
- Liver.

Hormonal regulation of metabolism

Carbohydrate, Lipid, Water and electrolyte balance, mineral metabolism, Osmoregulation.

Hormonal control of :

—Migration, aestivation, hibernation, pigmentation

—Reproductive behaviour and its control

—Male and female sexual behaviour;

—Maternal behaviour

—Endocrine basis of communication in reproduction and aggression.

—Pheromones and mammalian reproduction.

(3) Fishery Science and Wildlife

Unit 1 : General characters and classification of fishes with distinguish characters and important examples of the principal sub-divisions.

—Method of fish and prawn identification.

—Marine capture fisheries including crustacean and molluscan fisheries.

—Inland capture fisheries

—Exclusive Economic Zone (EEZ)

—Seaweeds of economic importance.

Unit 2 :

—Population, growth and age.

—Spawning and Fecundity.

—Methods of fishing

—Techniques employed in preservation of fish and prawn.

—Fish Transport and Marketing in India.

—Fish conservation and management.

Unit 3 :

—Food, Feeding and Breeding habits.

—Life histories of important cultivable species of freshwater and brackishwater fishes and prawns.

—Natural, wet and dry bandh techniques for breeding of Indian major carps; Induced Breeding in carps.

—Brief review of piscicultural practices in southeast Asia.

—Fish, prawn and pearl culture methods used in India.

—Status and potential of mariculture in India.

Unit 4 :

—Fish pathology-symptoms, aetology, prophylaxis and treatment of common diseases. Exotic fishes.

—Larvivorous fishes

—Adaptations in fishes.

—Fish as food.

—Fish products and by products.

Unit 5 :

—Major fishery exports from India

—Fisheries education, training and extension in India.

—Fishmen communities and organisation of fisheries cooperatives.

—Legislation.

—Sea exploration

—Fisheries by 2000

(4) Environmental and Animal Toxicology

1. **General Principles** : Introduction to toxicology, Principles of toxicology, Definition of toxicity and related terminology; Types of toxicity, Factors affecting toxicity, Acute, Sub-acute and chronic toxicity. Classification of toxicants, Criteria for selection of chemical for testing. Dose, Dose-response curves, Toxicity testing route of administration, Absorption, Distribution, excretion, Metabolism and biotransformation of xerobiotics.

2. **Toxic Agents and mode of action** : (1) Pesticides, (2) Metals, (3) Solvents and vapours, (4) Radiations and Radioactive materials, (5) Chemical carcinogens, (6) Toratogens, (7) Poisons and Toxins of animal and plant origin.
3. **Environmental Toxicology** : Food additives and contaminants air pollutants, Water and soil pollutants, Inhalation toxicology, Synthetics biomaterials
4. **Principles of systemic toxicology** : Toxicology of blood, Cutaneous, Development, Endocrine, Reproductive systems, Immune system, Intestinal, Liver, Kidney, Nervous system, Sense organs.

   —Genotoxicology

   —Principles, Mutagenesis, Mutagens carcinogenesis.
5. Statistical methods in toxicology.
6. Toxic residuces and analysis :

   —Persistence.

   —General procedures and techniques.

Special Paper VI

(1) Molecular Cell Biology, Cytogenetics and Biotechnology

1. **Organisation of the genome** : DNA, Histones, non-histone proteins, nucleosomes; heterochromatin and euchromatin; Chromosome identification; karyotyping.
2. **Genetic disorders** : Chromosome number; chromosomal abserrations and variation chromosomes and disease; chromosomes and evolution;
3. **Molecular genetics** : Chemistry of the gene: DNA replication; DNA modification, restriction and repair mechanism. DNA synthesis. Transfer of information from DNA. Gene expression and regulation of gene expression in eukaryotes. Isolation of gene.
4. **Biotechnology** : Overview, scope and importance; Recombinant DNA Technology and Gene cloning; Vectors, restriction enzymes, molecular probs; construction and screening of gene libraries; genome library, DNA library. PCR system and gene amplification, RELP analysis and restriction mapping, DNA fingerprinting. Chromosome walking, chromoseme jumping
5. **Biotechnology in Medicine and Biology** : Transfection methods and transgenic animals; Production of hormones. Vaccines; Gene therapy.
6. **Immunogenetics and Immunotechnology** : Immunoglobulins; Types, fine structure, generation and functional properties, cellular diversity in immune response; Hybridoma technology.

   —Cellular basis of immunity
7. **Cell transformation** :

   —Characteristics and molecular genetics of cancer; Oncogenes, retroviruses.
8. Effects of radiations, Chemicals, mutagens, pollutants, drugs and toxins on the cell.

(2) Molecular Endocrinology and Reproductive Physiology

Embryology of the gonads and the genital ducts

—Factors controlling sex determination

—Genetic control of sex determination.

—Endrocrinology of the foetal gonads.

Structure and function of the adult mammalian ovary :

—Histology.

—Folliculogenesis and its hormonal control

—Ovogenesis; The mammalian ovum.

—Follicular steroidogenesis and its control.

Follicular selection and its control :

—Ovulation, Mechanisms; Hormonal factors.

—Luteinization.

Corpus luteum and its control.

Factors regulating luteolysis.

Local non steroidal regulators of ovarian function inhibin, relaxin.

reproductive cycles and their hormonal regulation :

—exteroceptive and enteroceptive factors.

Gamete and Zygote transport

Biology of implantation

- Nidation, decidulization
- Placentation and its regulation
- Types of placentation
- Placental hormones and their regulation
- Foetoplacental unit as an endocrine entity

Parturition and its regulation

Structure of mammary gland

- Hormonal regulation of its development and differentiation.
- Maintenance of lactation
- Suckling and control of gonadotropin secretion.
- Ovarian and adrenal functions during lactation

The Male reproductive System

- Structure and function of the adult mammalian testis.
- Spermatogenesis and its hormonal control
- Sertoli Cells - endocrine/paracrine functions of the Sertoli cells, interactions in spermatogensis
- Structure and functions of Leydig cells, interactions between peritubular cells, Leydig cells and Sertoli cells in relation to spermatogenesis. Testicular steroidogenesis
- Structure, function and regulation of male accessory reproductive organs. Efferent ducts, epididymis, vas deferens. Seminal vesicles, coagulating gland, prostatic complex, Cowper's gland, preputial gland. Structure of sperm, biochemistry of semen, capacitation of spermatozoa
- Fertilization, acrosome reaction
- Tests for sperm viability and function
- Onset of puberty
- F[illegible] and senescence
- Principles and techniques [illegible] regulation in male and female
- Immunocontraception: gamete antigens, hormonal antigen
- Designing experiments for the study of breeding and fertility of laboratory animals. Care of Laboratory animals
- Surgical techniques in the study of mammalian reproduction
- Principles of bio-assay and application
- Techniques of RIA, EIA and radio receptor assay.
- In vitro fertilization, embryo transfer technique, collection and preservation of gametes
- Use of polyclonal and monoclonal antibodies in the study of reproduction

(3) Fishery Science and Wildlife

Unit 1 :

- Classification of mammals and review of major groups with reference to Wildlife - Primates, Carnivora, Artiodactyla, Perissodactyla and Proboscidea
- Review of Indian Avifauna - inland, coastal, resident and migratory birds
- Wildlife habitat - definition and importance of habitat studies. Habitat requirements of important wildlife species of India
- Habitat Suitability Index (HSI)
- Habitat Evaluation Procedures (HEP)
- Habitat Mapping

Unit 2 : Ecological sub-divisions of Indian Wildlife

- Himalayan mountain systems
- Indian deserts
- Peninsular India
- Tropical evergreen forests
- Andaman and Nicobar Islands
- Mangrove forests
- Methods of studying birds and mammals in their natural habitats.

Unit 3 :

- —Wildlife management in important National Parks, Sanctuaries and Biosphere Reserves in India.
- —Wildlife management in Protected Areas of Gujarat
- —Endangered and threatened species
- —International Trade in Endangered species
- —Causes of Wildlife depletion
- —Legislation - Wildlife Protection Act and Forest Act.

Unit 4 :

- —Wildlife management
- —Instruments used for management
- —Identification of damage and control measures
- —Afforestation
- —Social forestry
- —Wasteland and Pasture Development Projects in India.

Unit 5 : Wildlife conservation projects of Government of India, their scope and success .

- —Great Indian Bustard and Lesser Florican Projects
- —Project Tiger
- —Gir Lion Projects
- —Hangul Project
- —Crocodile Project
- —Musk Deer Project

(4) Environmental and Animal Toxicology

1. **Application of Toxicology :**
   (a) Analytical toxicology
   (b) Clinical toxicology
   (c) Occupational toxicology
   (d) Forensic science
   (e) Wildlife
   (f) Reproductive
   (g) Industrial
2. **Ecotoxicology :**
   Biogeochemical cycles
   - Carbon cycle
   - Phosphorous cycle
   - Nitrogen cycle
   - Oxygen cycle
   - Ozone depletion
   - Greenhouse effect
   - Global warming
   - Acid rain.
3. **Influence of human activities on Environment :**
   - Industrialization
   - Deforestation
   - Pollution - air & water
4. Environmental Policy - Social economic and legal aspect. Consumer product safety Commission
5. **Environmental impact assessment.**
6. National and International standards of tolerance and residual levels of pollutants and contaminants. Regulatory Toxicology
7. **Human Toxicology and Medical Ethics :**
   (1) Ethical considerations
   (2) Human Health
   (3) Monitoring for exposure

પરિશિષ્ટ '૭'

કામકાજ ક્રમાંક ૨(૭)

S.B.Com. ECONOMICS

Economics—Paper II (New Course)

(In force from June, 1997)

1. **Money** : Concepts of money and value of money - Theories of value of money - quantity theory of money. (Fisher's and Cambridge approaches)- Index numbers. (10%)
2. **Inflation** : Concept of Inflation-causes and effects of inflation-control of Inflation (10%)
3. **Monetory Policy** : Tools and objectives of monetory policy-Fiscal policy-Taxation, Public expenditure and Public debt (10%).
4. **Classical employment theory** : Say's Law of markets-Limitations and criticism-Pigou's theory of wage flexibility and full-employment (10%).
5. **Keynes Economic theory** : Introduction-consumption function-Multiplier analysis-Marginal efficiency of capital. (10%)
6. **International trade** : Factors affecting international trade-Richardia theory of International trade. Gains of international trade (10%)
7. **Terms of trade and trade policy** : Concept of terms of trade factors affecting terms of trade-Trade policies-Free V/s Protection.
   (For protection infant industries, for increasing employment and for industrialisation). (10%)
8. **Exchange Rate Determination** : Concept of equilibrium exchange rate-Absolute and relative versions of purchasing power theories of Exchange Rate. (10%)
9. **Monetary System** : Circumstances leading to the formation of IMF-its working-Exchange Rate policy and exchange rates under IMF. (10%)
10. **International Financial Institutions** : IBRD, IFC, IDA and Introduction to world Trade organisation. (10%).

S.Y. B.A. Economics — Paper III

(In force from June, 1997)

1. **Demand Analysis** : **(30%)**
   - (a) Law of diminishing Marginal utility - Law of demand - Limitation of utility analysis-Assumptions and Limitations-consumer's surplus.
   - (b) Indifference curve and consumer's equilibrium - Meaning and characteristics of indifference curve - Relationship between price line and indifference curve and consumer's Equilibrium.
   - (c) *Price effect* : Price consumption curve - Breaking of Price effect into income and substitution effects.
2. **Elasticity of Demand** : **(20%)**
   - (a) Price elasticity of demand and factors influencing it - income elasticity of demand. (Measurement of elasticity is not expected).
   - (b) *Cost and Revenue* . Types of cost-fixed cost variable cost and total cost Marginal cost-Average cost-Relationship between average cost and Marginal cost. Marginal, Average and total Revenue of a firm-Nature of Marginal revenue and average revenue in Perfect competition and other markets.
3. **Price-determination** : **(30%)**
   - (a) *Perfect competition* : Distinction between short and long period in the theory of price-determination-Equilibriom of the firm and industry as concomitant of price determination-Equilibrium of the firm and industry in Perfect competition in the short period and long period.
   - (b) *Monopoly* :Price determination in Monopoly-Price discrimination-possibility and profilability-Explanation of the behaviour of the discriminating firm, selling in two markets.
   - (c) *Monopolistic competition* · Product differentation and selling cost as its characteristics-selling cost, its effects on demand.

4. **Distribution** : **(20%)**
   - (a) Marginal Productivity Theory and Rent; Marginal Productivity theory of distribution as a general Theory of functional distribution-Richardian and Modern theories of rent.
   - (b) Wages and Profits : Collective Bargaining theory of wages - Effects of minimum wafes - uncertainty theory and innovation theory of Profit.

Paper IV : Indian Economic Problems

(1) Nature of population Problem - Effects of population growth - Population policy.
(2) Unemployment - Nature - Types and Magnitude - Government policy for the eradication of unemployment.
(3) Poverty : Absolute poverty and Relative poverty - Poverty Line-Indicators of poverty - Government policy for the eradication of poverty.
(4) Transformation of Indian Agriculture - Technological change and their significance.
(5) Land Reforms - Land ceiling and Tenancy Reforms.
(6) Overall view of Industrial progress of India - present Industrial policy of the Government of India.
(7) Importance and Problems of Public Sector in India - Importance and problems of Cottage and Small Scale Industries in India.
(8) Need and sources of Industrial Finance - their importance - Capital market in India - Institutional finance - Bank finance and lease finance (Detailed study of individula financial institution is not expected).
(9) Industrial Labour - Characteristics of industrial Labour-Steps taken by the Government to mitigate their problems.
(10) Environment - Importance of ecological Balance - Pollution - Types - Pollution Control.

Paper V : Comparative Economic Systems

(1) Economic System : Characteristics of economic systems - An overall view of existing economic system. (10%)
(2) Capitalism : General characteristics of capitalism - Economic institutions of capitalism - Private Property and inheritance - Freedom of enterprise, Competition and Price system - Limited Role of Government - Strength and Weaknesses of Capitalism. (20%)
(3) Communism : Marxian Critique of Capitalism - Features of Communism - Public Ownership of property and means of production - Centralised Planning - Limited Role of Price mechanism and markets. (20%)
(4) Mixed economies : Features of mixed economy - Role of Public enterprise in mixed economy - Planning and Price mechanism in a mixed economy. (20%)
(5) Centralised Planning in India - Lessons of Centralised Planning in India. (10%)
(6) Co-operation : Concept and Principles of co-operation. (10%)
(7) Gandhian Economic Thought : An overall view of Gandhian Economic Though. (10%)

Paper V : (Optional)

Any one from the following :

(1) Quantitative Economics - I
(2) Comparative Economics Systems
(3) Economic Investigation
(4) Accountancy Economics
(5) Industrial Economics.

1. **Quantitative Economics - I :**

   (*Note.*—The adjective in introducing this optional course in quantitative methods is to prepare the students for a better understanding of modern economics and methodological issues in economic analysis. As the idea there is to explain economic theory in mathematical language, student is not expected to solve complicated mathematical problems or purely statistical examples but to acquaint himself with the uses and limitation of mathematical and statistical techniques in economics.)

1. Nature of Mathematical Economics, Uses and limitation of mathematical techniques in Economics.
2. Concept of a function Dependent and independent variables Graphical representation of linear, quadratic exponential and logarithmic functions, Economics relations expressed in functional forms Examples of functions like demand and supply functions, utility, consumption, production, cost, population growth functions etc.
3. Determinants and Matrices Nature of any economic model. Examples of simple price determination and income determination models (Use only linear equations) Endogenous and exogenous variables. Static and comparative static analysis. Effects of commodity taxation on price and output in a linear market model.
4. Derivatives : (Functions of single Independent variable use only algebraic functions). Intutive explanation of limit and continuity (problems are not expected) concept of derivative. Application of derivatives to marginal analysis in economics, price and income elasticity of demand, labour and capital elasticity of output. Mathematical presentation of relation between average revenue and marginal revenue, Basic rules of differentiation.
5. Maxima and Minima (one independent variable use only algebraic functions) Economic applications in economic theory Maximisation of production, minimisation of everage cost. Relation between average cost and marginal cost. Equilibrium of firm under perfect competition and monopoly.
6. Functions of several variables (use only algebraic function) partial derivations and marginal analysis in economics Cobb-Douglas production functions, Maxima and minima. Laws of returns and laws of cost Maximisation of production, equilibrium of a firm with two products
7. Integration . Concept of Integration of simple linear and quadratic functions. Derivation of total cost, revenue and utility functions-from their respective marginal functions. Consumer's surplus (use linear functions only).

3. **Economic Investigation :**

(Eligibility : Those student who have offered Statistics at F.Y.B.A. as subsidiary or second subsidiary subject cannot offer this optional paper.)

1. Statistics : Definitions, importance, limitation, use and misuse of statistics
2. Sample and Census inquiry SRS. stratified systematic sampling, multistage and multiphase sampling with application
3. Data collection-Primary and secondary data-Design questionnaires-Survey methods-A study of socio-economic survey.
4. Classification and tabulation of data-Diagrammatical representation of data Bar Diagrams. Pie diagrams etc drawing of histograms. Ogive curves. frequency polygons and frequency curves
5. Measures of Central tendency - Measures of disperation-skewness, kurtosis.
6. Correlation and regression in two variables-Divariate tablescatter diagram.
7. Frequency definition of probability-properties of discrete and continuous properties of discrete and continuous probability distributions
8. Elementary study of Binomial. Position and normal distribution-Propertics of normal curve-study of normal area and ordinate-tables-Fitting of normal distribution
9. Standard errors of statistics like mean, median standard deviations, proback errors
10. Time series analysis-separating the given time series into trend. Sensonal and random components
11. Index numbers - Tests of index numbers - Fisher's Ideal index-number-construction of wholesale price index-number and cost of living Index number-spelling and defination of index numbers.
12. Large sample tests for attributes and variable.
13. Small sample tests - Acquaintance with t and f tables.
14. x^2 cost of (i) goodness of fit, (ii) Independence in 2×2 conflusence table-Yate's correction.

Note : In all the above. topics, logorous mathematical and statistical treatment must be avoided The objective for keeping this syllabus for S.Y.B.A. students in Economics is to got them familiar with tige statistical part which may be useful in any type of economic investigation in actual fields applications).

Reference

The above course is generally covered by the following books :

1. "Fundamentals of Statistics" by D. N. Eithance
2. "Applied Statistics for Economists" by Karmel.

4. **Accountancy (Optional Paper Economics) :**

1. Understanding of Economic and Accounting Transaction.
   (The distinction to be explained with simple illustrations) Allocation of Marks.
2. Use of terms in Economics and Accounting :
   (a) Business Entiry
   (b) Economic Value and Bank Value
   (c) Expense
   (d) Revenue of Income
   (e) Capital
   (f) Profit.
   (Distinctive implications of each term in 'Economic' and 'Accounting' should be made clear). Nos. 1 to 2, 15%).
3. Principles of double Entry Book-keeping; Meaning-Types of Account-Rules regarding debt and credit-its importance.
4. Journalisation Posting of Transactions in ledger. Accounts-Types of ledgers
5. Preparation of subsidiary Book, i.e., Purchase Book, Sale Book, Returns Inward Book, Returns outward Book, Petty cash Book.
6. Preparation of Final Accounts of an Individual Proprietor with primary adjustments (Nos. 3, 4, 5, 6. 60%).
7. Understanding the structures of a model Balance sheet of a Limited Company withj Reference to the following :
   (a) Arrangement and classification of "Assets" ... 10%
   (b) Arrangement and classification of "Liabilities".
8. Understanding the behaviour of costs-Fixed cost and variable cost (To be taught with the help of simple illustrations).

Total Marks 100%

N.B.—Qualification in Economics or Commerce will be eligible to teach this paper.

5. **Industrial Economics :**

1. Firm : Concept, Types of Firm Goals of a firm-Factors influancing the size and growth of firm Profit maximisation.
   Form of Business Organisation, Sole proprietership, partnership, Private Limited companies, Public Limited Companies.
2. Size and growth of firm : Factors influencing the size and growth of firm, the concept of optimum firm, Monopoly-growth and spread-causes and devices of establishing and prolonging monopoly, consequences of monopoly, control of monopoly, measures of controling monopoly and maintaining competition. Spread of monopoly-Multinational firm
3. Location : Factors influencing industrial location Resources endowments. State policy in india-Regional imbalances of industrial location-measures-removing imbalances. Industrial estates
4. Concept of Industrial Productivity factors influencing Industrial productivity Wages and productivity. Problems in the measurement of productivity-Rationalisation of industry-Need of Rationalisation in Indian Industries. Attitude of labour and managements Critical appraisal of the case for Automation in Indian Industries.
5. Natrue of Industrial finance, fixed and working capital, Source of financing in industries Equity and preference Shares debentures. company deposit. Institutional finance. foreign colaboration.
6. Public enterprises; case for public enterprises, forms of their organisation Departmental. Private limited company public corporation joint sector.

Books recommended

1. E A G Robinson Structure of Competitive Monopoly
2. E A G Robinson Monopoly
3. Y K Bhusan Business Organisation
4. J E Meade Economic Policy and Analysis
5. S C Kutchhal Industrial Economics
6. S C Kutchhal Financial Economics
7. Lipsey Introduction to Positive Economics

Second Susidiary Economics—Paper VII

(In force from June, 1997)

Some Problems of Indian Economy

The purpose of this paper is to acquaint the students with the major Problems of Indian Economy at an elementary level

(1) Agriculture :

(a) Importance of Agriculture in the Indian Economy
(b) Adeption of New Technology in Agriculture (Seed, Fertiliser, Irrigation)
(c) The Rationale of hand Reforms
(d) Agricultural Credit

(2) Industry :

(a) Importance of Industrial Development -
(b) Importance of Agro-Industry and Small Scale Industries
(c) Importance of Cottage-Industry
(d) Importance of Public Sector

(3) Money, Banking and Trade :

(a) R B I its Functions
(b) Problem of Inflation in Indian Economy
(c) Importance of exports in India
(d) Black Money - Origin - Control of Black Money

(4) Economic Planning :

(a) Objectives of Planning in India - outline of Ninth Five Year Plan
(b) Poverty in India
(c) Need of Population Planning
(d) Unemployment problem in India

પરિશિષ્ટ '૮'

કામકાજ ક્રમાંક ૨ (૮)

Syllabus for Second B.Sc.

MICROBIOLOGY

(Effective from June, 1997)

1. A student, who has passed his F Y B Sc examination with biology as optional subject or equivalent will be eligible to offer microbiology as the principle subject at S Y B Sc
2. A student offering microbiology as special will offer theory papers III, IV, and V, each paper being of 100 marks and practical I, II, III each practical being of 50 marks as prescribed here under
3. Each theory paper at the external examination shall be of three hours duration and carry 70 marks Each practical examination shall be for three consecutive days, each of five hours duration
4. Internal assessment will be from 30 marks for each theory paper and 15 marks for each practical paper
5. For each theory paper, there will be three lecture periods each of 45 minutes per week and one tutorial period, each of 45 minutes per week For each practical, there will be four practical periods, each of 45 minutes per week, with the total of 12 practical periods per week
6. Each topic of the theory paper has been given a specified lacture weightage In theory papers, proportional weightage should be given to each topic and subtopic
7. Each theory paper has been divided into five (5) units as mentioned From each unit, one question should be set Proportionate weightage should be given to each subtopic while setting the paper (as per lecture load given in the syllabus)

Paper III : Elements of Microbiology :

1. Developments in Microbiology : **15**

(a) *Discovery of microbial world* **4**
- Theory of abiogenesis and biogenesis work of Needham, Spallanzani, Schulze, Schwann, Schroder, T Von Dusch, Tyndall and Louis Pasteur
- Gem theory of diseases discovery of microorganisms as etiological agents of diseases, work of Robert Koch and Pasteur, Koch's Postulates
- Germ theory of fermantation, work of Pasteur
- Developments in pure culture techniques work of Robert Koch and Lister

(b) *Developments in medical microbiology* **3**
- Immunology and Chemotherapy Surgical asepsis-work of Lister
- Contributions of Landstainer Metchnikoff
- Discovery of vaccine work of von Behring, Janner and Pasteur
- Contributions of Ehrlich Domagk Alexander Fleming, Waksman

(c) *Developments in Agricultural microbiology* **3**
- Discovery of microorganisms as biogeochemical agents Contributions of Winogradsky Beijerinck
- Discovery of microorganisms as the plant pathogens Work of Erwin Smith, Barrill

(d) *Developments in virology and molecular biology* **5**
- Discovery viruses work of Iwanowski, Twort, d Herelle, Staley Enders, Robbins Luria, Delbruck, Lwoff Lederberge Watson, Crick, Jacob Monod Khorana, Kornberg Baltimore Sutherland
- Widening horizons in microbiology

Text Books

1. Pelczar M J, Chan, E C S Krig N R Microbiology, McGraw-hill Book Company, 1986
2. Stanier R Y Ingraham, J L Wheelis, M L, Painter P R General Microbiology, 5th ed, Macmillan India 1995

2 Techniques of Study of Microbiology :

(a) Microscopy :
* Principles of microscopy : resolving power. N. A. Magnification.
* Types of microscopy :
  (i) Light microscopy, simple and compound microscope, bright field and dark field microscopy.
  (ii) Phase contrast microscopy.
  (iii) UV and flurescene microscopy.
  (iv) Electron microscopy : general principles, types of electron microscopy; TEM and SEM, their principles, constructions, applications, and limitations. Preparation of specimen for electron microscopy : fixation, sectioning, positive and negative staining, freeze-etching, carbon replica, and shadow-casting.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology. McGraw-Hill Company, 1986.
2. Frobisher, M., Hinsdill, R. D., Crabtree, K. T., Goodheart, C. R. : Fundamentals of Microbiology, W. B. Saunders Company, 1974.

(b) *Stains and staining techniques :* 5
* Chemistry of dyes and stains : Definations, types of dyes and stains, acidic, basic and compound dyes, leuce compounds.
* Fixation of smears, use of moedants, intensifiers and decolorizers.
* Mechanism of staining reactions, factors affecting.
* Types of staining processes : Direct staining-simple staining. Differential staining-gram and acid-fast staining. Introduction to structural staining. Indirect staining-negative staining. Vital, intra-vital and supra-vital staining.
* Applications of stains and dyes in microbiology.

Text Books

1. Pelczar M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.

(c) *Pure culture techniques :* 5
* Definitions : Pure culture, axenic culture.
* Methods of isolation of microorganisms in pure culture : principles, use of physical, chemical and biological selection methods.
* Techniques : streak plate, pour plate, serial dilutions and single cell isolation techniques.
* Characteristics of pure culture.
* Preservation and maintainance of pure culture : subculturing, low temperature preservation, lyophilization, use of liquid nitrogen.
* Culture collection centres - their objectives and functions.
* Cultivation methods : cultivation of anaerobic organisms, by use of living tissue, prereduced media anaerobic jar and anaerobic chamber.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.

3. Principles of Bacterial Taxonomy : 7

(a) *Objective (goals) of classification :* 4
* Position of microorganisms in living world, Whitaker's five kingdom concept. Taxonomic groups, Species concept. Principles of binomial nomenclature. Criteria used for classification of bacteria.

(b) *Methods of classification :* 3
* Intutive methods, numerical taxonomy, genetic approach.
* Introduction to Bergey's manual, past and present status of bacterial taxonomy.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.

4. Eucaryotic Cells and Microorganisms : 8

(a) *Introduction to cell theory :* 2
* Typical cellular organization of eucaryotic microorganisms.

(b) *Fungi :* 4
* General nature, somatic structure, hyphal modifications. Fungal nutrition and cultivation.
* Reproduction - asexual and sexual modes.
* Introduction to fungal classification. Economic importance of fungi.

(c) *Algae and protozoa :* 2
* General characters and economic importance of algae and protozoa.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.
2. Alexopules, C. J., Mims, C. W. : Introductory Mycology, Wiley, 1979.

5. Phokaryotic Cells : Structure and Functions : 15

(a) *Typical prokaryotic cellular organization :* 2
* Size, Shape and arrangement of bacteria.
* Introduction to archaebacteria and eubacteria.

(b) *Surface appendages of bacteria :* 2
* Flagella - general characters, arrangements, ultrastructure Role of flagellain movement. Tactic behaviour of flagellated bacteria.
* General characters and significance of pili, prosthecae, and stalks.

(c) *Surface layers of bacteria :* 4
* General nature, chemistry and significance of capsule and slime layer.
* Cell walls : General nature, and composition of cell walls of gram positive and gram negative bacteria. Their significance to bacteria. Protoplast and spheroplast.

(d) *Internal cell structures :* 4
* Cell membrane : General nature composition and functions.
* Mesosomes and other internal membrane structures : their general nature and significance.
* Cytoplasm, ribosomes, cytoplasmic inclusions, vacuoles, nuclear material.

(e) *Bacterial endospores :* 3
* General structure and composition. Sporulation process-cytological and biochemical changes during sporulation process. Parasporal bodies. Spore germination-activation, germination and out growth.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.
2. Stanier, R. Y., Ingraham, J. L., Wheelis, M. L., Painter, R. R. : General Microbiology, 5th ed., Macmillan India, 1995.

6. Nature of Viruses : 15

(a) *General nature :* 3
* Structure and composition of viral capsids and nucleic acids.

(b) *Bacteriophages :* 7
* General nature, Morphological groups, Temperate and virulent phages. Lytic cycle. one-step growth curve, burst size. Lysogeny and lytic cycle.

(c) *Animal viruses :* 5
* General nature. Cultivation methods, CPE. Viral inclusion bodies, viral interference. Viroids and prions. Introduction to oncogenic viruses.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.

Paper IV : Introduction to Microbial Physiology :

1. Principles of Microbial Nutrition : 15

(a) *Basic nutritional requirements of microorganisms :* 3
* Macro and micro nutrients; chemical, physical and gaseous requirements.

(b) *Nutritional categories :* 5

* Introduction to diversities in microbial nutrition. Nutritional classification of bacteria on the basis of—
  (i) Sources of carbon, (ii) Sources of energy, (iii) Sources of electron donor, (iv) Oxygen requirements, (v) Temperature requirements, (vi)Miscellaneous parameters; viz. pH, osmotic pressure, salt requirements and hydrostatic pressure.

(c) *Culture Media* : 5
* Principles of media construction and media ingredients.
* Solid, solidified, semi-solid and broth media.
  (iii) Routine and specialized media : Selective, differential, enriched, enrichment, enumeration, assay and maintenance media.

(d) *Mode of nutritional uptake* : 2
* Entri of nutrients in the cell, passive diffusion, facilitated diffusion, and active transport.
* Utilization of nutrients that can not enter cell (extracellular digestion)

Text Books

1 Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.
2 Stanier, R. Y. Ingraham, J. L. Wheelis, M. L., Painter, P. R. : General Microbiology, 5th ed. Macmillan India, 1995.

2. Microbial Growth : 15

(a) *Reproduction methods, new cell formation* : 2

(b) *Growth* : 9
* Definition, growth rate and generation time, kinetics of growth and growth equation.
* Measurement of growth : cell mass and cell number.
* Normal growth curve of bacteria.
* Diauxic growth, continuous growth, Synchronous growth.
* Efficiency of growth, growth yield, maintenance energy.

(c) *Effect of environment on the growth* : 4
* Effect of temperature, pH, water activity, magnetism, nutrients, radiation, redox potential, solutes, salt tolerance, osmotic and hydrostatic pressure.

Text Books

1 Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.
2 Stanier, R. Y. Ingraham, J. L. Wheelis, M. L., Painter, P. R. : General Microbiology, 5th ed. Macmillan India, 1995.

3. Introduction to Bacterial Metabolism : 15

(a) Metabolism
* Definition, catabolism, anabolism, primary and secondary metabolism, intermediatery metabolism

(b) Energy metabolism 7
* Principles of bioenergetics, energy rich compounds of cells and their role
* General modes of ATP formation, substrate level phosphyrylation, role of electron transport, components of electron transport chain, formation of proton motive force, oxidative and photosphorylation, respiration and fermentation

(c) Heterotropic mode of nutrition . 4
* Utilizable substrates, catabolism of carbohydrates: Glycolysis and TCA cycle.
* General modes of degradation of amino acids-deamination, decarboxylation and transmination.

(d) Principles of anserobiosis 2
* Mechanism of oxygen toxicity.

Text Books

1 Pelczar, M. J., Chan, E.C.S. Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.
2 Stanier, R. Y. Ingraham J. L. Wheelis, M. L., Painter, P. R. : General Microbiology, 5th ed. Macmillan India. 1995

4. Microbial Control : 16

(a) Principles of microbial control : 3
* Principles, death rate, factors affecting antimicrobial control.
* General mode of action of antimicrobial agents.

(b) Physical agents of control : 4
* High temperature, Principles, thermal death time (TDT), and decimal reduction time.
* Direct heat, dry heat, moist heat, Tynodallization, Pasteurization, and sterlization.
* Principles of low temperature, refrigeration, Role of desiccation, osmotic pressure, radiation, sonic waves, surface tension in microbial control.
* Control by filtration, Bacteriological filters.

(c) Chemical agents of control : 4
* Ideal antimicrobial chemical agents and its characteristics.
* Major grouses of antimicrobial chemical agents; Phenols, alcohol, saldehydes, halogens, Heavy metals, dyes, quarternary ammonium compounds, gaseous agents.
* Evaluation of germicides; Use of tube dillution, agar plate methods, Phenol coefficient test.

(d) Chemotherapy : 5
* Principles of chemotherapy, types of chemotherapeutic agents.
* Antibiotics and synthetic drugs, antibiotics and their mode of action, antifungal, antiviral agents.
* Synthetic chemotherapeutic agents; Sulfonamides, PAS, nitrofurans
* Drug resistance.
* Assay of antibiotics.
* Non-medical uses of antibiotics.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.

5. Enzymes : 15

(a) Biocatalyst : 5
* General characters of enzymes, physico-chemical properties of enzymes localization of enzymes, extracellular and intracellular
* Nomenclature and classification of enzymes.

(b) Mechanism of enzyme action : 5
* Role of active sities, Factors influencing enzymes activity; effect of substrate concentration, enzyme concentration, pH, temperature, Enzyme inhibition; competitive and non-competitive.

(c) Regulation of enzyme activity : 5
* Regulation of enzyme synthesis, operon regulation.

Text Books

1 Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986

Paper V : Introduction to Applied and Environmental Microbiology :

1. Microbiology of Soil : 15

(a) Physicochemical characteristics of soil : 4
* Soil as a culture medium, soil microflora, methods of study of soil microflora, Microbial interactions in soil; neutral positive and negative associations.

(b) Microorganations as biogechemical agents : 7
* Introduction to biochemical transformations in soil, mineralization and immobilization of elements.
* Nitrogen cycle; proteolysis, ammonification, nitricication, denitrification, nitrogen fixation.
  Sulphur cycle; sulphur oxidation and reduction, Winogradsky column Carbon cycle. Degradation of complex organic compounds, carbon dioxide fixation, formation of humus and its importance.
  Iron cycle; iron oxidation and reduction.

Phosphorus cycle; mineralization, immobilization and solubilization.

- Application of microorganisms as biogechemical agents; principles of bioleaching. 4

(c) Agricultural microbiology :

- Rhizosphere, definition, types, rhizosphere flora, effect on plants.
- Soil fertility, role of microorganisms in soil fertility, Biofertilizers.
- Introduction to plant pathology; microorganisms as etiological agents, for plant diseases. General sympotoms, mode of transmission and control of plant diseases.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.
2. Stanier, R. Y., Ingraham, J. L., Wheelis, M. L., Painter, P. R. : General Microbiology, 5th ed., Macmillan India, 1995.

2. Food and Dairy Microbiology : 15

(a) Microbiology of Foods : 10

- Microbial flora of fresh foods.
- Microbial spoilage of foods : Role of microorganisms in food spoil age : spociloage of fresh and canned foods.
- Food bone infections and food poisoning : sources of contamination. Introduction to food infection and food poisoning. Role of Staphylococcus aurous, Clostridium, and Salmonella app. as food poisoning.
- Preservation of foods : General principles. Methods of preservation : Use of aspetic handing; high temperature : Pasteurization, sterilization; canning; low temperature, dehydration and preservations; developed and added preservatives.
- Fermented foods : Pickles, saure kraut, silage, sausages and bread. Introduction to Indian fermented foods. Micro-organisms as food : Mashrooms and single cell proteins.

(b) Dairy Microbiology : 5

- Milk as culture medium. Origin of microorganisms in milk. Types of microorganisms in milk and their role in spoilage; biochemical types and pathogenic types. Methods of microbial analysis of milk; grading of milk.
- Preservation of Milk; pasteurization : principles, methods determination of efficiency of pasteurization, sterilization, use of low temperature, drying and other methods, sweetened condensed milk.
- Fermented dairy products. Starter culture; cheese-types, curdling, processing and repening. Other fermented dairy products : Introduction to yogurt, cultured buttermilk, acidophilus milk, Kafir and cultured sour cream.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.
2. Frazier, W. J. and Westhoff, D. C. : Food Microbiology, McGraw-Hill Book Co., 1978.

3. Aquatic Microbiology : 15

(a) Introduction : 2

- Natural waters : atmospheric surface, stored and ground waters.
- Aquatic environment, conditions affecting microflora viz temperature, hydrostatic pressure, light, salinity, pH, dissolved organic and inorganic matter, turbidity etc., Distribution of microorganisms in aquatic environment.

(b) Microbiology of drinking water : 8

- Sanitary survey, microbial indicators of fecal pollution, coliforms as indicators, need for their differentation, methods of differentiation of coliforms, IMViC test and elevated temperature test, indicators other than coliforms. Water borne diseases.
- Microorganisms other than coliforma as nuisance; organisma-slime forming bacteria, iron and sulphur bacteria, algae.

(c) Bacteriological examination of drinking water : 5

- Sampling methods, quantitative analysis, test for detection of coliforms.
- Purification of drinking water supplies : Sedimentation, filtration : use of sand filters and disinfection.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.

4. Environmental Microbiology : 15

(a) Pollution microbiology : 6

- Pollution, types of pollutants, their sources and effect on ecology. Pollution by pesticides, oil and detergents. Biomagnification of pesticides. Role of microorganisms in biodegradation of environmental pollutanta. Bioremediation.
- Biodeterioration of materials : biodeterioration of paper, textiles, paints wood and metals.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.
2. Atlas, M. R. : Microbiology, Fundamentals and Applications, Macmillan Pub. Co., 1989.

(b) Microbiology of waste water (sewage) : 6

- Types of waste water, chemical and microbiological characteristics, BOD, COD and TOD as indicators of strength of waste water. Pollution problems due to disposal of untreated waste water.
- Methods of waste water treatment. Primary treatment, secondary (biological) treatment, principles, role of microorganisms in spetic tank, Imhoff tank, trickling filters, activated sludge process, oxidation pond methods. Advanced treatment and final treatment.
- Solid waste processing : anaerobic sluge digestion and composting.
- Introduction to recycling of waste water.

Text Books

1. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, McGraw-Hill Book Company, 1986.

(c) Microbiology of air : 3

- Occurrence and distribution of microorganisms in air, Microbial pollution of air, dust, droplet and droplet nuclei. Control of air pollution, air sanitation. Importance of air borne microorganisms in laboratory and industry, air borne infections.

Text Books

1. Frobisher, M. Hinsdill, R. D. Crabtree, K. T. Goodheart, C. R. : Fundamentals of Microbiology, W. B. Saunders Company, 1974.

5. Introduction to Industrial Microbiology : 15

(a) Concept of fermentation : 3

- Development of fermentation industry, range of fermentation processes. Types of fermentation processes, aerobic, anaerobic, surface, submerged, batch and continuous.

(b) Principles of industrial fermentation processes : 10

- Characteristics of industrial fermentation media. Important raw materials used for fermentation media preparation-molasses, corn steep liquor, sulphite waste liquor.
- Typical industrial fermenter.
- Factors affecting fermentation process.

(c) Introduction to biotechnology, aims and achievements 2

Text Book

1. Casida, L.E. : Industrial Microbiology, John Willey & Sons, 1968.
2. Trevan, M. D., Boffey, S., Goulding, K. H. Stanbury, P. : Biotechnology : The Biological Principles, Tata McGraw-Hill, 1987.

Units of Theory Papers

Paper III : Elements of Microbiology :

	No. of Lectures
Unit I : Developments in microbiology	15
Unit II : Techniques of study of microbiology	15
Unit III : Principles of bacterial taxonomy, and Eucaryotic cells and microorganisms	15
Unit IV : Prokaryotic cells : Structure and function	15
Unit V : Nature of viruses.	15

Paper IV : Introduction to Microbial Physiology :

Unit I : Principles of microbial nutrition
Unit II : Microbial growth
Unit III : Introduction to bacterial metabolism
Unit IV : Microbial control
Unit V : Enzymes.

Paper V : Introduction to Applied and Environmental Microbiology.

Unit I : Microbilogy of soil
Unit II : Food and dairy microbiology
Unit III : Aquatic microbiology
Unit IV : Environmental microbiology
Unit V : Introduction to industrial microbiology.

Books Recommended for Further Reading

1. Alexander, M. : Introduction to soil Microbiology, Wiley, N. Y., 1977.
2. Atlas, R. M. : Microbiology, Fundamentals and Applications, Maxwell Macmillan Int. Ed., 1988.
3. Brock, T. (ed.) : Milestones in Microbiology, prentice-Hall, N. J., 1961.
4. Collins, C. M. Lyne, P. M., Gran., J. M. : Microbiological Methods, Butterworths, 1989.
5. Krig, N. R. (ed.) : Bergey's Manual of Systematic Bacteriology, Vol. 1, Williams and Wilkins, Baltimore, 1984.
6. Lehninger, A. L. : Principles of Biochemistry, Worth Publishers, N. Y., 1982.
7. Mandelstam, J., McQuillen, K. (ed.) : Biochemistry of Bacterial Growth, Blackwell Scientific Pub., Oxford, 1973.
8. Pelczar, M. J., Chan, E.C.S., Krig, N. R. : Microbiology, Concepts and Applications McGraw-Hill Inc., International Ed., 1993.
9. Rose, A. H. : Chemical Microbiology, Pelenum, N. Y., 1976.
10. Singh, R. H. : Plant Diseases, Oxford and IBH, 1983.
11. Sneath, P.H.A. (ed.) : Bergey's Manual of Systematic Bacteriology Vol. 2, Williams and Wilkins, Baltimore.
12. Staley, J. T. (ed.) : Beargey's Manual of Systematic Bacteriology, Vol. 3, Williams and Wilkins, Baltimore.
13. Tortora, G. J., Funke, B. R., Case, C. L. : Microbiology, An Introduction, Benjamin, Qumins Pub. Co. Inc., 1989.
14. Vashishta, B. R. : Botany : Part II Fungi, S. Chand and Co., New Delhi, 1973.
15. Williams, S. T. (ed.) : Bergey's Manual of Systematic Bacteriology, Vol. 4, Williams and Wilkins, Baltimore
16. Salle A. I. : Fundamental Principles of Bacteriology. Tata : McGrow Hill Pub. Co. cts., 1974.

Practicals

1. Introduction to principles working and operation of laboratory instruments : Microscope, autoclave, hot air oven, pH meter, colorimeter, centrifuge, shaker, colony counter, bacteriological filters.
2. Cleaning of glassweares and preparation for sterilization.
3. Disposal of laboratory waste and cultures.
4. Microscopic examination of bay infusion.
5. Study of mitility of bacteria by handing drop method and use of semisolid media.
6. Micrometry : Measurement of size of microorganisms by using stage and ocular micrometer.
7. Staining of bacteria :
   (a) Simple or monochrome staining of bacteria.
   (b) Negative or indirect staining of bacteria.
   (c) Differential staining : Gram's staining and acid fast staining.
   (d) Structural and special staining :
      (i) Staining of bacterial endospere by Dorner's method.

      (ii) Cell wall staining by Dyar's method.
      (iii) Capsule staining by Hiss's method.
      (iv) Volutin granule staining by Albert's method.
      (v) Nucleus staining of yeast cells by Feulgen's staining.
      (vi) Staining of spirochetes by Fontana's method.
8. preparation, pH adjustment and sterilization of nutrient broth and nutrient agar media.
9. Use of selective, differential entichment and enriched media : MacConkey's agar, EMB agar, Bismuth sulphite agar, triple sugar iron agar, glucose yeast extract agar, and Ashby's mannitol agar.
10. Cultivation methods of bacteria, use of broth culture, agar slope culture method.
11. Isolation of bacteria in pure culture : use of streak plate and pour plate methods.
12. Cultivation of anaerobic bacteria, using thioglycollate broth and Robertson's cooked meat medium.
13. Preservation of bacteria by subculturing and low temperature method.
14. Study pigment production by bacteria.
15. Effect of environment and chemicals on growth of bacteria :
   (a) Study of effect of pH, temperature, osmotic condition using broth culture medium.
   (b) Study of effect of heavy metal ions-oligodynamic action.
   (c) Study of effect of antibiotics by use of disc method and agar ditch method.
16. Isolation and study of morphology of fungi; Mucor, Rhizopus, Aspergillus, Penicillium, Neurospora, Fusarium and yeast.
17. Isolation and study of bacteriophage from sewage.
18. Study of Biochemical reactions used for characterization and identification of bacteria :
   (a) Tests based on carbohydrate metabolism :
      (i) Fermebtation of sugar; glucose, xylose, lactose, mannitol, maltose, surose. (ii) Oxidative and fermentative degradation of glucose by using Huge and Leifson's medium. (iii) Methyl red test and Voges-Proskauer's test. (iv) Starch utilization test.
   (b) Test based on protein and amino acid metabolism. :
      (i) Degradation of cascin. (ii) Degradation of gelatin by use of gelatin agar and nutrient gelatin media. (iii) Indole production test (iv) H_2S production test (v) Amino acid deamination test, study of phenyl alanine deamination. (vi) Amino acid decarboxylation test, by using Moller's medium.
   (c) Test based on lipid study of hydrolysis of tributyrene.
   (d) Other tests :
      (i) Catalase test. (ii) Dehydrogenase test (iii) Citrate utilization test (iv) Urea degradation test (v) Ammonia production test. (vi) Nitrate reduction test. (vii) Litmus milk test.
19. Study of pure culture of :
   (a) Gram positive bacteria (i) Staphylococcus aureus and Bacillus subtilis.
   (b) Gram negative bacteria (ii) Escherichia coil, Enterobacter aerogenes. Pseudomonas aeruginosa. Proteus vulgaris, Salmonella typhi, Salmonella typhi para A, Salmonella typhi para B.
20. Study of microbial flora of skin.
21. Study of microbial flora of air.
22. Bacteriological analysis of water :
   (a) Quantative analysis by standard plate count.
   (b) Detection and differentiation of coliforms from water by presumptive test, confirmed test, and completed test.
   (c) Enumeration of MPN for coliforms from water.
23. Study of soil bacteria :
   (a) Isolation of nitrogen fixing bacteria Rhizobium from leguminous root nodules and Azotobacter from soil
   (b) Isolation of actinomycetes from soil.
24. Study of plast pathogens :
   (a) Study of bacterial cozing and isolation of pathogen from specimen of leaf showing citrus canker.

(b) Study of plast disease specimens :
(i) Powdery mildew of grapes. (ii) Black stem rust of wheat. (iii) Loose smut of wheat, (iv) Grain smut of jawar. (v) Downy mildew of bajara. (vi) Angular leaf spot of cotton, (vii) Tobacco mosaic disease (viii) Citrus canker.

1. Each student must prepare at least 15 permanent slides of bacteria and fungi.
2. The candidate is required to bring for inspection at his practical examination, his own practical journal, duly signed and certified.
3. The viva-voce will be illustrative of theoretical portion of the syllabus.
4. The marks distribution and scheme of exercise will be as follows :

Practical Paper - I	*Marks*
(a) Special and structural staining of bacteria	10
(b) General exercise	10
(c) Spotting	10
(d) Viva-voce	05
	Total 35

Practical Paper II	*Marks*
(a) Isolation and Identification of gram negative bacteria	20
(b) Study of biochemical reaction	10
(c) Journal and slides	05
	Total 35

Practical Paper III	Marks
(a) Bacteriological analysis of water	
(i) Quantitative analysis by SPC	10
(ii) Presumptive test or MPN	10
(b) Effect of environment/antibiotics on bacteria	10
(c) Viva-voce	05
	Total 35

5. General exercise will be from the following practicals :
(a) Micrometry, (b) Isolation of bacteriophage, (c) Isolation and identification of fungi, (d) Anaerobic cultivation, (e) Study of air or skin flora, (f) Study of soil bacteria and plant pathogens

પરિશિષ્ટ '૯'

કામકાજ ક્રમાંક ૨ (૯)

S.Y.B.Sc. CHEMISTRY

(New Syllabus in force from June, 1997)

Paper III : Inorganic Chemistry :

Unit I :

(a) *Wave Mechanics* : Wave postulates of quantum mechanics, Wave function and its interpretation. Operators (linear, gersitian their addition, substraction and multiplication) commutators, setting up of Hamiltonian operator up to carbon, Eigen function Egien values and its significance, Mean or Expectation value. Srodinger Equation - Particle in a box. (10 marks)

(b) Inert Gas Compounds. (4 marks)

Unit II :

(a) *Structure of complexes* . Valence Bond theory of complexes, principles and its application to determine structure and magnetic properties of complexes limitations of V. S. Theory. (4 marks)

(b) *Crystal field theory* : d. orbital splitting of octahedral, tetrahedral complexes in strong and weak crystal field. Effect and application of crystal field splittings, Magnetic properties of High spin and Low spin complexes. Di, HSP and LSP configuration, their relative stabilities. Thermodynamic properties of crystal field splitting-Enthalpy of Hydration of M^{+2} ions. lattice energies of MCl_2 compounds of first row Transition Elements (10 marks)

Unit III :

(a) *Chemical Bonding* : Molecular orbital treatment ICAO principle for sigma (6) and Pi(X) bonds; Bonding, Antibonding and Non-Bonding molecular orbitals., calculation of Bond order. MO representation of Homepolar molecular -C_2, N_2, O_2 and F_2 and Heteropolar molecular-Co, No, and oN-ion Mo Treatment of metalic Bond. (10 marks)

(b) MO Theory as applied to complexes and MOS of (CoF_6)-3 and $(Co(NH_3)_6)$+3 ions (4 marks)

Unit IV :

(a) Chemistry of Titanium, Platinum and Tungston. (6 marks)

(b) Physio-chemical principles of Na_2CO_3, NH_3, NaOH (4 marks)

(c) Nuclear Fission (4 marks)

Unit V :

(a) Fertilizers, industries in India, Manufacture of ammonical fertilizers ammonium salts, Urea, Nitrates. phosphates and super phosphate, Mixed fertilizers Micronutrients and their role in fertilizers. (5 marks)

(b) Deuterium and its compounds. (4 marks)

(c) Types of pollutions particular for water pollution C.O.D., B.O.D. and D.O., and Method of determination. (5 marks)

Reference Books

1. 'Introductory Quantum Chemistry' : A. K. Chandra, 4th edn., McGraw Hill (1994)
2. 'Quantum Mechanics in Chemistry' . M. W. Hanna, 3rd ed., Benjamin, Monlo Park, California. 1981.
3. 'Basic Inorganic Chemistry' F. Albert Cotton, G. Wilkinson, P. L. Gaws, 3rd edn . John Wiley, New York, 1995.
4. 'Advanced Inorganic Chemistry' : F. A. Cotton, G. Wilkinson and P. L. Gaw 5th Edition. John Wiley and Sons, New York, 1988.
5. 'Valency and Molecular Structure' . E. Cartmell and G.W.A. Fowles, 3rd edn. ELBS. Butter worths, 1970.
6. 'Theoretical Inorganic Chemistry' : M. C. Day & J. Selbin, 2nd ed., East West Press 1985
7. 'A New Gonsice Inorganic Chemistry' J. D. Lee 4th Edition, 1991. ELBS & D. Van Nostrand Company Ltd.
8. 'Molecular Quantum Mechanics' : P. W. Atkins, 2nd Edn., Oxford University Press New York, 1983.

9. 'The Importance of Antibonding Orbitals' : Jaffe
10. 'Inorganic Chemistry Principles and Structure and Reactivity' : J. Huneey, E. A. Keiter and R. L. Keiter, 4th ed Hauper Collins College, Publishers, 1993.
11. 'Vovel's, Quantitative Analysis' : 6th ed. Orient Longman, London, 1987.
12. 'Introduction to Advanced Inorganic Chemistry' : P. J. Durant and B. Durant.

Paper IV : Organic Chemistry

Unit I :

(a) Chemical Reactivity and Molecular structure (Acid-Base Properties). Proton acid-bases scale of acidity-basicity. Resonance effect, drawing of resonance structures and the conditions for resonance. Effect of change of hybridisation on acidity and basicity. Inductive and electronic effects, Steric effects and hydrogen bonding. Lewis acids and bases. Keto-enol Tantome crism and factors affecting its equilibrium. Acid and base catalysed mechanism of interconversion of the Keto and enol forms of MAA. (8 marks)

(*Reference Book* : Organic Chemistry by Cram-Hendrikson and Hamond; Sec. 8.1 to 8.9 Except 8.9).

(b) (i) Conformational Analysis of Mono and Dimethyl Cyclohexanes. (Finer Vol. II)
(ii) Stereochemistry of Oximes: Oximes, Nomenclature of oximas Determination of configuration of aldoxides. Determination of configuration of Ketoximes. (6 marks)
Beckmann transformation and its mechanism. (Finer Vol. II).

Unit II :

(a) *Electrophilic Substitution (Aromatic)* : Introduction, Effect of substituent groups. Determination of orientation. Determination of relative reactivity, classification of the substituent groups, orientation of disubstituted benzenes, orientation and synthesis. Mechanism of nitration, sulfonation, friedal Craft alkylation, halogenation, acylation, Desulfonation, Isotope effect. Mechanism of electrophilic substitution. two steps; Reactivity and orientation Theory of orientation, Electron release via resonance Effect of halogen on electrophilic aromatic substitution. (Charter, 14 of Organic Chemistry 5th Edition by Morrison & Boyd). (8 marks)

(b) *Polynuclear Aromatic Hydrocarbons* : Fused Ring compounds; Nomenclature of Naphthalene derivatives Structure of Naphthalenes Reactions of Naphthalene. Oxidation reduction. dehydrogenation, nitration, halogenation, Orientation of electrophilic substitution (SE) in Naphthalene; Friedal and Craft) alkylation and acylation) Sulfonation. Naphthols; Orientation of electrophilic substitution in Naphthalene and its derivatives. Synthesis of Naphthalene derivative Haworth Synthesis, Anthracene, Phenanthrene Reactions; Preparations of both and their derivatives (by ring closure) caranogenic hydrocarbons (Chapter 34 of Or. Chemistry. Morrison & Boyd 5th Edition). (6 marks)

Unit III :

(a) *Carbohydrates* : Definition and classification. (+) Glucose : an aldose : (-) Fructose : 2-Ketose Stereo isomers of (+) Glucose. Nomenclature aldose derivatives. Oxidation, effect of alkaliesazone formation and epimers. Lengthening of carbon chain of aldose; Ruff-degradation. Conversion of aldose into its opimers, configuration of glucose-fischer's Trof. Configuration of the aldoses-optical families of L & D Absolute configuration Formation of Glucoside; cyclic structure of D(+) Glucose and conformation. (as per Morrison-Boyd 5th Edition. (10 marks)

(b) *Synthesis and Reactions of B-dicarbonyl Compounds* : Introduction. The classen condensation, synthesis of EAA and Malonic ester. Their synthetic applications (4 marks)
(Org. Chemistry, Ivth Edition by T. W. Graham Solomns Page Nos. 941 or Org. Chemistry, I. L. Finar).

Unit IV :

(a) *Heterocyclic Compounds* : Heterocyclic systems, structure of Pyrrole, furan, and thiophene. Sources of Pyrrole, furan and thiophene Electrophilic substitution in pyrrole, thiophene and furan. Reactivity and orientation in S. E. reactions in five-membered heterocycles. Structure of pyridines. Sources of pyridine compels. Reactions of pyridine. Electrophilic substitution in Pyridine and Nucleophilic substitution in pyridine. Basicity of pyridine. Quinoline and Isoquinoline (7 marks)
(Organic Chemistry 5th Ed. by Morrison and Boyd)

(b) *Cyclo Alkanes* : Open chain and cyclic compounds Nomenclature physical properties, Industrial sources. Preparation and reactions : Reactions of small ring compounds Baeyer strain theory. Heats of comsustion and relative stabilities of cycloalkanes. Orbital picture. angle strain, Factors affecting stability of confermations.
(Org. Chemistry 5th Ed. Morrison & Boyd)
Org. Chemistry, Final Vol. I, page No. 558 to 560). (7 marks)

Unit V :

Ultraviolet Spectroscopy : The nature of electronic transitions. The Origin of UV Bond structure. Principles of absorption spectroscopy. Presentation of spectra, solvents. What is chromophere ? The effect of conjugation on alkenes.
Problems of dienes using woodward-Fieser Rules for dienes, carbonyl compounds enones and Problems of Enones using the Woodward rules, Aromatic compounds and Polynuclear hydrocarbons. Problems on Aromatic Ketones Aldhydes, acids and esters using empirical rules. (14 marks)
(Introduction to spectroscopy by PGVIA, Lampmen, Kriz, Publishers, W. S. Saunders - Company)
(Organic Spectroscopy by William Kemp Published by McMillan Press Ltd.)
(Introduction to Organic Spectroscopy by Lamert, Shurvell, Ligutner and cooks, Published by McMillan & Co.)
(Spectroscopic Methods in Organic Chemistry by Ludley H. Williams and Ion Fleming McGraw Hill Tata-Edition)
(Applications of Absorption spectroscopy of Organic compounds by John R. Dyer Prentice Hall)

Reference Books

1. 'Introduction to Spectroscopy' : Pavla, Lampman and Kriz W. B. Saunders Company
2. 'Organic Spectroscopy' . William Kemp, 3rd ed , MacMillan & Co., 1991.
3. 'Introduction to Organic Spectroscopy' Lambert, Shurvell Lightner and Cooks-MacMillan Press Ltd.
4. 'Spectroscopic Methods in Organic Chemistry' D. H., Williams & Fleming, 4th ed., McGraw Hill, 1989
5. 'Application of Absorption Spectroscopy of Organic Compounds' J. R. Dyer, 5th ed Prentice-Hall of India, Delhi, 1984, Reprint, 96
6. Organic Chemistry' Cram, Hammond & Hendrickson, McGraw Hill Series IIIrd Ed
7. 'Organic Chemistry' . R. J. Morrison & R. N. Boyd. 6th ed Prentice Hall of India, ltd., 1996.
8. 'Fundamentals of Organic Chemistry', 3rd ed T. W. Graham Soloman, John Wiedy, New York, 1990.

Paper V : Physical Chemistry

Unit I :

Thermodynamics : Spontaneous process, carnot cycle, efficiency of heat engines Entropy change for an ideal gas Entropy changes at constant pressure and constant volume. Entropy of mixing of ideal gases. Entropy change during a phase change, Entropy change in irreversible processes The physical significance of entropy Free energy and maximum work function. Helmholtz equation for constsnt volume processes and gibbs-Helmholtz equation Derivation only) clapeyron-clausius equation (Derivation only) (14 marks)

Unit II :

(a) *Electro chemistry* : Transference numbers. It determination by Hittorf method Moving boundary method Results of T. No. Measurements Determination of solubilities by conductance measurements. Conductometric Titrations Activity and activity coefficients Ionic strength. Debye-Huckel limiting law (No Derivation) (5 marks)

(b) *Nuclear Chemistry and Solids State Chemistry* : Units of radioactivity Curies, rutherford Becqueral Nuclear radius. Detection of ionizing radiations by G. M. Counter Scientilation counter and proportional counter. Acceleration of charged particles by cyclotron Linear accelerator (5 marks)

(c) *Solid State Chemistry* : (A) X-ray and crystal structure. Millers indices hkl-notation Bragg's equation X-ray study of NaCl and KCl crystal. Determination of Avogradro Number (N) by X-ray method. (4 marks)

Unit III

(a) Colloids : Colloidal state, preparation, purification, stabilising of colloids. Optional and electro Chemical properties of colloids. Electrophoresis precipitation by electrolytes, Hardy-Schulze rule electrokinetic phenomenan, gels and emulsions. Molecular weights of colloidal subsances by Osmotic pressure methods. Dennan equilibrium method, ultracentrifuge. Light scattering method, viscosity method. (7 marks)

(b) Chemical Kinetics : Effect of Temperature on reaction rates. Energy activation. Reaction occuring in stages opposing reaction consecutive reactions, chain reaction (H_2 + Cl_2 system) simple collision theory of reaction (7 marks)

Unit IV :

(a) *Polymer Chemistry* : Polymerization - step (condensation) polymerization, chain (addition) polymerization. Free redical addition Polymerization.

Molecular weight averages. Measurements of molecular weights. (5 marks)

(b) *Catalysis* : Criteria of catalysis. Types of Catalysis negative catalysis. Hemogeneous catalysis. Heterogeneous catalysis. Inhibition, properties of catalytic surfaces, active centres promotors retardation and poisoning. Enzyne catalysed reactions. (4 marks)

(c) *Adsorption* : Types of adsorption, adsorption of gases. Frudlich and Langmuir isotherms. Adsorption from solutions. Unimolecular insoluble films. Gibb's equation (No derivation). (5 marks)

Unit V :

(a) [illegible] *Properties and Molecular Structures* : Moler volume, surface Tension and [illegible] Viscosity. Molar Refraction. Optical rotation. Polar and non-polar molecules. [illegible] Dipole moment. Its measurement only by Temp. method and its application. Diamagnetism and paramagnetism. Magnetic susceptibility. Magnetic moment [illegible] by Gauy method. (7 marks)

(b) Distribution law. Distribution co-efficient. Deviations from distribution law. Association of [illegible] of the solvent. Dissociation of the solute in one of the solvents. the solute [illegible] with one of the solvents. Process of extraction (7 marks)

Reference Books

1. [illegible] Physical Chemistry' [illegible] and Lewis, 2nd Ed., MacMillan & Co.
2. [illegible] of Physical Chemistry . Maron & London 4th Ed.
3. Physical Chemistry' : Walter Moore 4th ed . Orient Longman
4. Physical Chemistry . Daniels & Alberty 4th Ed
5. Physical Chemistry . G. M. Barrow, 5th ed., McGraw Hill, New York, 1988
6. Physical Chemistry' P. W. Atkins, 5th ed . Oxford Uni. Press, 1984.
7. Physical Chemistry' Lavine
8. 'Thermodynamics' Glasstone
9. Electrochemistry' Glasstone
10. 'Vogel's Quantitative Inorganic Analysis', G. Svehla, 6th Ed. Orient Longman, 1987.
11. Analytical Chemistry' D. Askoog, D. M. West, F. J. Holler, 5th ed . Saunders College Publishers London, 1990

Syllabus for Practical

Inorganic Practicals :

1. (a) Calibration of burette, pipette etc
   (b) Testing of purity of the reagents e.g. chloride in nitric acid, carbonate in alkalies and nitrate in sulfuric acid
2. *Inorganic qualitative analysis* . Semimicro method of Analysis of mixture of powders containing FOUR radicals including soluble PO_4^{3-}, excluding insoluble phosphate, arsenite, arsonate and borate (minimum eigh mixture should be performed by the student). Mixture may be partly soluble in water and soluble in acid charcoil test to be omitted. Semimicro methods must be followed
3. *Volumetric Analysis*
   (a) Nitrate by back titration (in given sample of water)
   (b) Hardness of water Ca^{2+} & Mg (Total hardness) by EDTA

   (c) Estimation of Ni and Mg using EDTA and Erichrome Black T.
   (d) Gravimetric analysis :
   (i) Iron as Iron oxide, (ii) Ni as Mi (DMG), (iii) Ba as $BaSO_4$, (iv) Al as Al_2O_3

Organic Practicals

Organic Spotting of atleast Fourteen substances from the following list should be performed by the student, with one derivative wherever possible.

List of Substances recommended

(a) *Acids* : Benzoic, salicylic, cinnamic, Phthalic, Anthranilic, oxalic, citric, tartaric P-nitrobenzoic acid.

(b) *Phenols* : B-Naphthol, Naphthol, nitrophonol, Panitrophenol, and Resoecenol.

(c) *Amines* : Aniline, P-Toluidine, P-nitroaniline, M-nitroaniline.

(d) *Neutral* : Compounds : Toluene, Anthracene, Glucose, Acetanilide, Urea, Acetamide, Acetophenone, Acetone, Benzaldehyde, Thiourea, Chlorobenzene, Chloroform, Carbon totrachloride, Ethyl acetate, methylacetate, Benzamide, Propanol, Butanol and cyclohexanol.

(e) Estimation : Estimation of amide.

(f) Estimation of Glucose.

Practical Examination for Principal B.Sc.

(Two days, Six hours everyday examination)

(1)	(a) Gravimetric *exercise	20 marks
	(b) Organic Spotting	20 marks
	(c) Volumetric/Organic Estimation	20 marks
(2)	(a) Physical exercise	20 marks
	(b) Inorganic Qualitative	20 marks
	(c) Viva (Regandiy practicals only)	05 marks
	Total	105 marks

(*Gravimetric results should be collected on the same day at the end of six hours)

Note : In gravimetric and Volumetric analysis or Wherever applicable the 10 ml pipette, 100 ml measuring flask & 25 ml Barette must be used

Physical Chemistry Practical

1. To determine the relative strength between HCL and H_2SO_4 by studying hydrolysis of methyl acetate catalzed by acid
2. To determine the Temperature co-efficient and energy of activation by hydrolysis of methyl acetate catalysed by acid.
3. To study the adsorption of an organic by animal characoal method
4. To titrate conductomatrically (Cell constant)
   (1) HCL.........NaOH
   (2) CH_3COOH........NaOH
   (3) HCL + CH_3COOH....NaOH
5. To determine absolute viscosities of A, B and (A+B) mix. Calculation method No Graph)
6. To determine specific refraction and molar refraction of liquid A and B and mixture of A+B. (Calculation method No Graph)
7. To determine the specific rotation of optically active substances such as glucose or sonrce
8. To study the distribution law. Benzoicacid + Benzone + Kerocene
9. To determine water equivalent and determine the ionization of week acid

પરિશિષ્ટ '૧૦'

કામકાજ ક્રમાંક ૨ (૧૦)

એફ.વાય. બી.એસસી. ભૌતિકશાસ્ત્રમાં નીચે મુજબના ફેરફારો કરવા. આ ફેરફારો જૂન, ૧૯૯૭થી અમલમાં આવશે :

૧. "કોમન સેમિસ્ટર ટ્રાન્ઝિસ્ટરનો પ્રયોગ રદ કરવામાં આવે છે" અને તેને બદલે પી.એન. જંક્શન ડાયોડનો ઉપયોગ કરી દ્રવ્ય અચળાંક (Material constsnt) અને રિવર્સ સંતૃપ્ત પ્રવાહ એ બે પ્રાચલો નક્કી કરવા. (Si અને GE બન્ને માટે).

૨. "ફ્રેસ્નેલ પ્રિઝમ"નો પ્રયોગ રદ કરવામાં આવે છે અને તેને બદલે નીચેનો પ્રયોગ ઉમેરવામાં આવે છે :
"કાળની મદદથી અનિયમિત આકારના પદાર્થની જડત્વની ચાકમાત્રા શોધવી."

૩. "થેવેનીન પ્રમેય અને નોર્ટોન પ્રમેયના પ્રયોગમાં નોર્ટોન પ્રમેયવાળો ભાગ રદ કરવામાં આવે છે અને તેને બદલે નીચેનો પ્રયોગ ઉમેરવામાં આવે છે :
"મહત્તમ પાવર - સંક્રમણ પ્રયોગ".

૪. "બ્રિજિંગ ઓફ મલ્ટિમીટર"નો પ્રયોગ રદ કરવામાં આવે છે અને તેને બદલે નીચેનો પ્રયોગ ઉમેરવામાં આવે છે :
"[illegible] બ્રીજ વડે ઇન્ડક્ટન્સનું મૂલ્ય શોધવું".

૫. [illegible] બ્રીજની મદદથી એ.સી. પ્રતિસ્થાપન વાપરીને આયોનિક દ્રાવણની અવરોધકતા શોધવી - આ [illegible] આવે છે.

૬. [illegible] પ્રયોગમાં શીર્ષકમાં રેગ્યુલેશન ફેક્ટરને બદલે "પ્રતિશત રેગ્યુલેશન" એમ [illegible].

૭. [illegible] રેક્ટિફાયરના અભ્યાસ [illegible] મુજબ રાખવામાં આવે છે. "પી.એન. જંક્શન રેક્ટિફાયરના અભ્યાસ નીચેના બે કિસ્સાઓ માટે કરવો" :
(૧) ફિલ્ટર વિના (૨) 'સી' ફિલ્ટર સાથે.
બન્ને કિસ્સાઓમાં રિપલ ફેક્ટર અને પ્રતિશત વોલ્ટેજ રેગ્યુલેશન શોધવું.

૮. ટ્યુટોરિયલ નોટબુક ઓછામાં ઓછા ૫૦ દાખલાઓ સાથે તૈયાર કરવી.

પરિશિષ્ટ '૧૧'

કામકાજ ક્રમાંક ૨ (૧૧)

Second B.Sc. (BOTANY) New Course)

(In force from June, 1997)

This course is to be completed by assigning three period per paper per week for theory and practicals of four periods per paper per week and one tutorial period per paper per week. For tutorials and practicals the class may be divided in batches of fifteen students.

Paper III : (Algae, Fungi, Lichen, Bryophyta, Pteridophyta and Gymnosperm). Classification and Life History of the following including morphology and excluding developmental aspects.

Unit I :

1. **Algae** (algae) : Classification as per smith and general characters and life histories of the following :
   (1) Cyanophyta : Gloeocapsa, Oscillatoria, Mostoc.
   (2) Chlorophyta : Ulothrix, Oedogonium
   (3) Chrysophyta : Vaucharia.
   (4) Phaeophyta : Ectocarpus.
   (5) Rhodophyta : Batrachospermum.
   Economic importance of algae as a source of food, fodder and fertilizer.

Unit II :

2. **Fungi** (Fungi) : Classification as per smith. General characters and Life history of the following :
   (1) Phycomycetes : Pythium
   (2) Ascomycetes : Cleviceps
   (3) Basidiomycetes : Puccinia.
   Symptoms and remedial measures of the diseases caused by Pythium, claviceps and Puccinia.
   Economic importance of fungi as food (Yeast and Mushrooms) and Medicine (Ergot and Penicillin).
3. **Lichen :** Classification, Structure and Reproduction of Usnea.

Unit III :

4. **Bryophyta :** Classification (as per smith). Structure, Reproduction and life history of Riccia, Marchantia.

Unit IV & V :

5. **Pteridophyta :** Classification (as per smith) Structure, Reproduction, and Life history of Selaginella, Equisetum, Adiantum. (Including anatomy)
6. **Gymnosperm :** Classification Structure, Reproduction and Life history of Pinus (including morphology and anatomy of root, stem and Leaf)

Embryology :

1. Development of male and female gametophyte (Monosporic, Bisporic and Tetrasporic).
2. Fertilization.
3. Types of Endosperms.
4. Types of Embryo development : (a) Crucifer type. (b) Monocot type.

Economic Botany :

(Scientific name, Family, useful parts important contents of the plant (if any) and uses should be cited with the reference to the following plants.) :

Ephedra, Clove, Ginger, Fennel, Rauwolfia, Adhatoda, Cotton, Jute, Lawsonia, Tea Coffee and Coconut.

Ethnobotany :

1. Use of Forest resources by tribal races of Gujarat with the special reference to "Dangs and 'Bhils'.
2. Ethnobotanical aspects of the following plants :
   (1) Acacia arabica (nilotica)

(2) [illegible] monosperms
(3) Emblica affiemalis
(4) Holarrhena antidysentrica
(5) Madhuca indica (Bassia latafolia)
(6) Boswelha Serrata
(7) Terminalia bellerica
(8) Terminalia chebula
(9) Diospiros melanoxylon

Paper IV :

(Angiosperms. Morphology. Anatomy. Embryology. Economic Botany and Ethnobotany)

Unit I :

Principles and outline classification of Bentham and Hooker (excluding merits and demerits)

Families :

Anonaceae. Cruciferae (Brassicaceae) Rutaceae, Caesalpinae. Combretaceae. Rubiaceae, Compositae (Asteraceae), Apocynaceae. Convolvulaceae, Scrophulariaceae Labiatae, Euphorbiaceae. Palmae and Graminae (poaceae). (Final diagrams are not expected. Plants of economic importance should be cited.)

Unit II : **Morphology** :

1 Stem (Types & modification)
2 Phyllotaxy
3 Inflorescence (All types)
4 Flower (aestivations & Placentations)
Fruits (A) Simple fruits
(i) Dry (Caryopsis. Follicle, Legume, Capsules. siliqua, cypsella. Nut
(ii) Fleshy : Berries. Erupes, (B) Aggregate & (C) Composite fruits.

Unit III : **Anatomy** :

1 Meristems (Characters. Classifications and Theories)
2 [illegible] tissue system
3 Mechanical tissue system
4 Types of Vascular bundles
5 Stele (types only)
6 Anamolous secondary growth
(Salvadora stem Dracena stem. Carrot root, Tinospora root).

Botany—Paper V

(Bio-Chemistry, Bio-Physics, Physiology, Cytology, Genetics, Ecology, Plant-Geography and Applied Botany)

Unit I & II :

* **Bio-Chemistry and Bio-Physics** :
(a) pH and Buffer (b) Isotopes and their uses in Biology (c) Solutions and colloidal systems (d) Protoplasm as a colloidal system (e) Enzymes . Definition, Classification, properties and factors affecting rate of enzymatic activities and mechanism of enzyme action.
* **Physiology** :
(a) Diffusion. Imbibition. Osmosis - Plasmolysis (b) Absorption - Active and Passive (c) Ascent of Sap - including all theories. (d) Transpiration - Process, Mechanism of stomatal regulation. factors affecting transpiration-Guttation. (e) Translocation. Upward, downward and Lateral (f) Mineral Nutrients : Macro and Trace elements (g) Heterotrophic Nutrition.

Unit III :

* **Cytology** : Ultrastructure and functions of : Endoplasmic Reticulum, Ribosomes, Dictyosomes, Lysozomes, Microbodies and Cell Wall.
* **Genetics** : Basic introduction to Mendelian genetics (Mendel's laws of heradity)
Transformation. Transduction. Linkage and Crossing over, Chromosomal aberrations.

Unit : IV & V :

* **Ecology** : Ecosystems, components of ecosystem and flow of energy in ecosystem. Ecological pyramids of numbers, Biomass and energy.
Biogeo-chemical cycles : N_2 & CO_2 , Morphological and anatomical adaptations of Hydrophytes, Xerophytes and Halophytes.
* **Plant Geography** : Brief account of the following topics with reference to Gujarat :
(a) Forests (b) Grass lands (c) Savanah (d) Coastal Vegetation (e) Arid zones
* **Applied Botany** : Basic concept of
(a) Agronomy (b) Horticulture (c) Forestry (d) Plant breeding (e) Tharma-cognosy (f) Plant pathology (g) Biotechnology and Tissue culture.

Botany —Paper VII Second Subsidiary
(New Course)
(In force from June, 1997)
Theory Syllabus

(Plant Types, Angiosperms, Anatomy, Physiology, Economic Botany, Cytology and Genetics)

Plant types : Structure, Classification, Reproduction and Life History of the following :

Algae : Ulothrix, Fungi, Puccinia, Bruophyta, Riccia. pteridophyta. Equisetum, Gymnosperm, Pinus-External morphology and cones (Delet developmental aspects) Angiosperms. Anonaceae, Rutaceae, Combretaceae, Apocynaceae, Eupharbiaceae, palmae. (Two plants of economic importance should be cited from each family, floral diagrams not Expected).

Anatomy : Meristem-Apical-Cell theory, Histogen theory and Tunica corpus theory
Types of stele-(Evolutionary aspect deleted)
Secondary growth Normal-Cucurbita stem, Tinospora root
Abnormal - Salvadera stem, Nyctanthus stem.

Physiology :
Absorption-Active absorption and passive absorption of water
Ascent of Sap
Transpiration
Translocation of Organic solutes

Economic Botany :
(Botanical Name, Family Important, plant constitutions and uses)
Cereals-Wheat, Rice, Maize
Pulses-Tur, Chana, Pea
Fibres-Cotton, Jute
Beverages-Tea, Coffee
Timber-Teak, Sal, Deodar
Medicinal plants-Sarpgandha, Vasaka (Ardusi), Tulsi, Jinjer, Turmeric.

Cytology and Genetics :
Generalized plant cell Mendel's law of heridity
Nucleic acids-DNA, RNA. Double hellical structure.

Practical - I
(Based on Paper III)

I plant types from Algae to Gymnosperm :
(a) Study of types as prescribed in theory syllabus
(b) The anatomy of the root, stem and leab of pteridophytes and gymnosperms Through permanent slides. Dissection of cone and section passing through sori (Adiantum) is expected.

Practical II
(Based on Paper IV)

I. *Angiosperms* .
(a) Study of families as per theory syllabus with locally available plants. Floral formulae expected. (Floral diagram is not expected).

(b) Students are expected to submit a minimum of to mounted herbariam sheets of standard size.

II *Morphology* : As per theory syllabus.

III *Anatomy* :

(a) Study of root and shoot apices and apical cells (Chara and Dictyota) through permanent slides

(b) Laticeferous tissues :
Vessels - Argemone, Launca root
Cells - Euphorbia tirucalli.

(c) Mechanical tissue system —
Nyctanthus stem, Maize stilt root, Maize leaf, Colocasia Detiole.

(d) Types of vascular bundles and stele through permanent slides.

(e) Study of anamolous secondary growth as theory syllabus. Double stained (Fast green and saffranin only). Temporary preparations should be prepared. (Passing of section through Alcohde services is not required).

IV. *Embryology* :

(a) Study of pollen-tube germination from any two pollen grain.

(b) Study of permanent slides : m.m.c., 8-nucleated embryosac, globular embryo, T. S. of mature anther, endosperm-haustoria, Dauble fertilization.

V. *Economic Botany* : Speciments and their products to be damonstrated as per theory syllabus.

VI *Ethno Botany* : Specimens, Herbarium sheets to be demonstrated as per theory syllabus.

Practical III :

(Based on Paper V)

Biophysics and Biochemistry :

(a) pH - Soil, tap water, Lemonjuice, Lime-water

(b) Sulphur and agar-agar colloidal system.

(c) Demonstration of mechanical and chemical adsorption.

(d) Histochemical test for cellulose, starch, lignin and fat

(e) Enzymetic activity of amylase and catalase from plant material.

Physiology :

(a) The following experiments are to be set by the students and results are expected :
  (i) To demonstrate the phenomenon of diffusion of gases (NH_4OH HCl).
  (ii) To demonstrate the phenomenon of osmosis (a) potato osmoscope (b) exosmosis and endosmosis in colocasia petiols, croton stem.
  (iii) Plasmolysis experiment in *Tradescantia* leaf, croton bicolour leab.
  (iv) Transpiration—(a) Cobalt-chloride paper, (b) Four leab-experiment.
  (v) To demonstrate the countinuety of air spaces in plants.

(b) Demonstration experiments :
  (i) Imbibition experiments
  (ii) Thisle funnel experiments
  (iii) Brownian movement in any one of the following Indian Ink, latex, curd.
  (iv) Positive root pressure
  (v) Conduction of water through xylem
  (vi) Ganong's potometer, Farmer's potometer
  (vii) $CaCl_2$ experiments
  (viii) Relation between transpiration and absorption
  (ix) Suction due to transpiration
  (x) Helerotrophic nutrition : The specimens showing heterotrophic nutrition to be demonstrated :

  Agarious, cuscuta, Loranthus and Viscum on host, Orobanchae as root-parasite, Nepenthus, Utricularia, Drosera.

Cytology :

Photographs, charts, models of cell-organells as per theory syllabus.
Genetical problems based on theory syllabus.

Ecology :

Hydrophytes : —Hydrilla stem, leaf —Trapa-leaf, petiole, Nymphaea-leaf, petiole
Xerophytes : —Casurina-stem, Nerium-leaf, Agave-leaf, Aloe-leaf.
Halophytes : —Avicennia leaf, Suaedaleaf.

Permanent slides :

(a) Vallisneria leaf, (b) Marselia petiole, (c) Hakea leaf, (d) Amophilla leaf, (e) Phoenix leaf.

Maps showing vegetation of Gujarat.

—Botanical study tour : Students are expected to go on botanical study tour with in state.

Practical Syllabus

(As Second Subsidiary Subject on Paper II/VII)

1. Plant Types should be studie as per theory syllabus through fresh/preserved material and/ or permanent slides.
2. **Angiosperm** : Study of families as per theory syllabus with locally available plants.
3. **Anatomy** : Study of root and shoot apices and apical cell, (Dictyota) through permanent slides.
   Stele types to be studied through permanent slides only study of normal and abnormal. Secondary growth as per theory syllabus.

Physiology : Following experiments are to be demonstrated.

* Conduction of water through xylem.
* Root pressure
* Loss of water due to Transpiration
* Relation between absorption and transpiration
* Cobalt chloride ($COCl_2$) experiment
* Ganong's potometer experiment.

Economic Botany :

Specimen and their product to be demonstrated as per theory syllabus

પરિશિષ્ટ '૧૨'

કામકાજ ક્રમાંક ૨ (૧૨)

Computer Science at First B.Sc.

(New Course in force from June. 1997)

Upgrading of Computer Education in the Science Stream in Colleges

Objectives :

(a) Upgrading Syllabus for Current Day relevance in computers.

(b) Integrating Computer papers into regular Science stream.

Introduction : The background to the proposal is the current situation of Compute[r] courses in the current science colleges setup. Two papers in computers are offered. These papers are additional optionals. Students are not required to pass in the exams in order to be promoted to the next class nor is their class affected by the marks they receive.

Due to this situation while there is an initial interest in computers in the first year the data of the numbers shows that with the pressure of exams this number drops significantly. A futher reason for the drop in numbers in the fact that the subject offered in the 2nd year namely Fortran programming is no longer popular in the computer world since, other programming languages have overshadowed it. This situation therefore, points to two main steps that need to be taken.

(a) The syllabus needs to be made more relevant.

(b) The computer papers must be offered with a view that marks must be taken into accoun[t] as far as promotion and grades are concerned.

Some facts : Computers have been introduced as a second subsidiary optional subject into the Arts Stream as an integral part of the course pattern, and do affect passing and grading in Arts. Looking at the data in Arts one sees that the number of students is highly static. The course are relevant and hence very popular.

In the commerce stream too while computers were introduced in the first and second year as additional optional subject. just like in the Science stream due to the problems faced by computers that we described in the Science stream, gradually diminished interest and attendance was the tune of the day.

About three years ago the commerce stream took effective action in order to update their courses and made the computer paper a part of the regular syllabus in hich they could opt for computers as regular optional papers. The result has been that computers have become extremely popular in the commerce stream and a look at the recent data shows that the number of students opting for them are upto the mark.

Without a doubt the status of computer papers as additional subsidiary subject affects the response of the students. It puts extra pressure on them in terms of time energy and demands of work. In the face of pressure of exams motivation weakens and the additional subject is the first subject to suffer.

A contradiction in terms : While Gujarat University has stabilized computers in Arts and Computers it is a contradiction in terms that in the Science stream this has not been done. One does not have to argue that computers are an important tool in scientific research and development. Hence science students must be offered the opportunity to familiarize themselves with computers. Hence computers must be an integrated optional in the Science stream that counts for passing and grades.

The advantage of computer training as part of under graduate education in the university is that it has allowedaccess to students who would otherwise not have access to computer education because of high fees in private institutes. The option of getting computer training in computers at nominal fees is an important consideration that the university will do well to keep in mind.

A change of the system in science will not require additional staff or sanction from Government, since these have already been approved and sanctioned in the present setup. We are therefore proposing the following :

(a) Upgradation of the course—Two papers in place of the old have been proposed (i) Computer Application 1; (ii) Computer Application 2.

Corresponding to each of these papers there will also be practicalsin computer application.

(b) Integration of papers into the syllabus : We propose that these two papers are offered as one of the subject combination in the A group, at the F.Y.B.Sc. level. Thus a student may opt for : (i) Physics, Maths, Comp. App.; (ii) Physics, Chemistry, Comp. App (iii) Chemistry, Biology, Computer Application.

Note : Individual colleges may limit themselves to any of these choices depending on their timetable logistics.

The max. no. : A maximum number of 30 students may be allowed per college.

Impact on other subjects : No adverse impact is expected on the other subjects since computer science is not to be offered as a major subject or a subsidiary subject. It has been proposed only as a possible combination in the first year. It is strongly recommended and urged that this method integration be followed.

If on the other hand, computers are offered as an optional subject then the following changes are suggested : Computer Application 1 in FY Computer Application 2 in SY. In FY as an 8th paper and in SY as a 7th paper. The passing for promotion in such optional papers should be compulsory and marks should be counted for class.

Case for 1st option : Precedence exists for integrating computer as one of the main options at FY level in the Gujarat University in the Science stream. For instance, 30 students in the 1st year are allowed to take Physics, Maths and Industrial Chemistry dropping regular Chemistry. Similarly 30 students in the 1st year are allowed to take Physics, Chemistry and Biotech dropping regular Biology. In this context, the request to allow Computer Application as a combination is highly relevant.

Computer Science Paper I :

Basic Programming

* INTRODUCTION
  - Constants, Variables
  - Variable types
  - Line numbers and lables
  - Operators
  - Hierarchy of operators
  - Use of parantheses
  - Expressions.
* ASSIGNING THE VALUES
  - LET, READ, DATA, RESTORE, INPUT Statement
  - LET Calculation statements
* PRINTING OUTPUT
  - PRINT, LPRINT Statements
  - Spacing of output within a line
  - Use of semi-colon, Comma, TAB function
* REM, STOP, END Statements
* HAND TRACING A PROGRAM
* TRANSFERRING CONTROL
  - GOTO, IF-THEN-ELSE, ON-GOTO Statements
* BUILDING LOOPS
  - WHILE-WEND
  - FOR-NEXT
  - DO WHILE-LOOP
  - Nested Loops
* ARRAY CONCEPT AND IT'S USE
  - Subscripted variables
  - DIM Statements
  - OPTION BASE Statement
  - SWAP Statement
  - Multidimensional Arrays.

SORTING OF AN ARRAY
FUNCTIONS
-LIBRARY FUNCTIONS
-NUMERIC FUNCTIONS
INT, FIX, ABS, SGN, SQR, VAL, RND, LEN, ASC, INSTR, SPC RANDOMIZE
STATEMENT
-STRING FUNCTIONS
LEFTS, RIGHTS, MIDS, CHRS, STRS, STRINGS, SPACES
USER DEFINED FUNCTIONS
SUBPROGRAMS AND SUBROUTINES
GOSUB-RETURN Statements
FORMATTED OUTPUT
PRINT USING Statement
FILES
FILE, RECORD, FIELD CINCEPT, SEQUENTIAL FILE HANDLING.

Digital Computer Fundamentals

* Introduction of Computer
  - -Historical background of Computer Development
  - -Anatomy of the computer
  - -Basic Structure
  - -Data representation within the computer
  - -Arithmetic and Logical unit
  - -Memory Unit
  - -Control Unit
  - Input/Output Devices.
  - CPU Databuses, Address buses, Registers
* Input/Output Devices :
  - Floppy-Physical and Logical records, sectos, clusters Cylinder tracks
  - -Boot Strap, FAT, Directory Maintenance, using debug an other standard tools to maintain floppies (PCTOOLS).
* Computer Languages
  - -Machine codes, Assembly codes, High level languages
  - -Development of a Computer program : -Algorithms, Flowchart
  - -Compiling, Debuging, Testing
* Computer and Operating Systems
  - -Computer configurations
  - -Peripherals
  - -Batch Processing
  - -Operating Systems
  - Multiprogramming, Time sharing, Real time
  - -Local Area Network
* Brief sketch of Computer Applications
  - -Sciences, Business, Industry, Metereology, Space Tech., Communications, Government Administration, Public Utilities.
* Number system.

Word Star

* INTRODUCTION OF WORDSTAR
* VARIOUS MENUS/COMMANDS OF WORDSTAR
  - -Creating Documents
  - -Editing Documents
  - -Printing Documents
  - -Onscreen formating
  - -Block & Save Commands

  - -Help Commands
  - -Print Commands
  - -Quick Commands
  - -Dot Commands
  - -Mailmerge
  - -Spell Check

Louts 1-2-3

* INTRODUCTION
  - -What is spreadsheet ?, Realeases of LOTUS
* GETTING STARTED WITH LOTUS
  - -What is a worksheet ?
  - -Types of Data, Label Prefix
  - -Control Panel
  - -Indicators : Mode, Status, Date & Time
  - -Lotus Command Menu
  - Function Keys
* LOTUS COMMANDS
  - -/Copy command
  - -/Move command
  - -/Worksheet Global command
  - -/Worksheet Delete command
  - -/Worksheet Column command
  - -/Worksheet Earse command
  - -/Worksheet Titles command
  - -/Worksheet Window command
  - -/Worksheet Status command
  - -/Worksheet Page command
  - /Range Protect
  - -/Range Lable
  - /Range Erase
  - -/Range Name Create
  - -/Range Justify
  - /Range Input
  - -/Range Transpose
  - /Range Value
  - -/Range Formate
  - -/Relative, Absolute, Mixed Addressing
  - /File Save & Retrieve
  - -/File List, Earse, Directory
  - /Print Printer/File
  - -/Data Fill, Sort
  - /Graph.

* FUNCTIONS
- MATHEMATICAL
  - -@ABS, @INT, @LOG, @MOD, @RAND @ROUND, @SQRT
= STATISTICAL
  - @AVG, @COUNT, @MAX, @MIN, @SUM.
= LOGICAL
  - -@FALSE, @IF, @ISERR, @ISNA, @ISNUMBER, @ISSTRING, @TRUE
= STRING
  - @CODE @FIND, @LEFT @LENGTH, @LOWER, @MID, @REPEAT, @REPLACE, @RIGHT, @N, @S, UPPER @TRIM, @VALUE

DATE & TIME
@DATE, @NOW, @DATEVALUE, @DAY, @MONTH, @YEAR, @TIME, @TIME VALUE, @HOUR, @MINUTE, @SECOND
SPECIAL
@@, @CELL, @CELLPOINTER, @ERR
MACRO
What is a Macro ?
Command Macro
Advanced Macro LET BRANCH IF FOR FORBREAK, GETLABEL, GETNUMBER, MENUBRANCH

Computer Science Paper II

NETWORKING
An introduction
Over view of LAN
Components of LAN
SYSTEM ANALYSIS AND DESIGN
LOTUS
Introduction
What is spreadsheet ? Realeases of LOTUS GETTING STARTED WITH LOTUS
What is a work sheet ?
Lable Prefix
Indicators Mode, Status, Date & Time
Lotus Command Menu
Function Keys
LOTUS COMMANDS

	Range Name Create
	Range Justify
	Range Input
Worksheet Insert command	Range Transpose
Worksheet Delete command	Range Value
Worksheet Column command	Relative, Absolute, Mixed
Worksheet Erase command	Addressing
Worksheet Titles command	
Worksheet Window command	File Save & Retrieve
Worksheet Status commnd	File List, Erase, Directory
Worksheet Page command	Print Printer/File
Range Extract	Date Fill, Sort
Range Label	Graph
Range Erase	

Functions :

Mathematical Functions : @ ABS, @ INT, @ LOG, @ MOD, @ RAND, @ ROUND, @ SORT

Statistical Functions : @AVG, @COUNT, @MAX, @MIN, @SUN

Logical Functions : @FALSE, @IF, @ISERR, @ISNA, @ISNUMBER, @ISSTRING, @TRUE.

String Functions : @CODE, @FIND, @LEFT, @LENGTH, @LOWER, @MID, @REPLAT, @REPLACE, @RIGHT, @N, @S, UPPER, @TRIM, @VALUE.

Date & Time Functions : @DATE, @NOW, @DATEVALUE, @DAY, @MONTH, @YEAR, @TIME, @TIMEVALUE, @HOUR, @MINUTE, @SECOND.

Special Functins : @@, CELL, @ CELLPOINTER, @ ERR

MACRO
What is a Macro ?
Command Macro
Advanced Macro LET BRANCH IF FOR FORBREAK, CENTLABEL, GETNUMBER MENUBRANCH

4 DATA BASE CONCEPTS
What is data base ?
Data Base creation, modifications & commands

APPEND	DELETEDO	REINDEX
APPEND FROM	EDIT	REPLACE
APPEND FROM ARRAY	EOFO	SEEK
APPEND GENERAL	FIELDO	SELECT
APPEND MEMO	FILOCRO	SETDATE
BROWSE	FIND	SETDELETED
CHANGE	INDEX	SETEXCLUSIVE
CLOSE	LIST	SETFIELDS
	LOCATE	
	LUPDATE	SETINDEX
CONTINUE	MODIFY	SETMEMOWIDTH
COPY INDEXES	MODIFY LABEL	
COPY MEMO	MODIFY MEMO	SET RELARION
COPY STRUCTURE	MODIFYREPORT	
COPY TO	MODIRY SCREEN	
COPY TO ARRAY	MODIFY STRUCTURE	SKIP
CREATE	NDX	
CREATE FROM	PACK	TOTAL
CREATE LABEL		UPDATE
CREATE REPORT		
		ZAP

SET COLOR COMMANDS
SET COLOR OF
SETCOLOR TO
SET CONSOLE
SET DELIMETERS
SET DEVICE
SET DISPLAY
ESCAPE
ECHO
FORMAT
INTENSITY
ARRAY
ACOPYO
ADELO
ADIRO
AELEMENTO
STRENGS
ALLTRIMO
ATO
CHRO
KEYBOARD
LOWERO
LTPGMO
PADO
PROPERO
PADCO
PADLO
MUMERIC
ASCO
AVERAGE
INTO
LASTKEVO
LOCICAL :
EMPTYO
EXIT
FILEO
DATE
CDOWO
CMONTHO
CTODO
UTILITY
COPY
DELETE FILE
ERASE
BRANCHING & LOOPS
DO WHILE
ONERROR
ON ESCAPE
ON KEY

MARGIN
MESSAGE
SET PRINTER
SET SCOREBOARD
SET STATUS
SET STATUS BAR
SET SYSMENU
SET TALK
SET TYPEAHEAD
SETO

AFIELDSO
ALNSO

ALENO
ALLASO

PADRO
RATO
REPLICATED
RTRIMO
RIGHTO
SETFUNCTION
SOUDEXO
SPACEO
STRO
STRTRANO

LENO
MAXO
MCLO
MODO

IIIFO
ISALPHAO
ISCOLORO

DATEO
DAYO
DOWO

FILEO
RENAME
SETALTERNATE

ONKEY =
ONKEYLABEL
PROCEDURE
RESUME

ASCANO
ASORTO

DECLARE
DIMENSION

STUFFO
SUBSTRO
TIMEO
TRANSFORMO
TRIMO
TYPEO
UPPERO
VERSIONO
WAIT

MIROWO
PCOLO
PROWO
VALO

ISDIGTTO
ISLOWERO
ISUPPERO

DTOCO
DTOSO
YEARO

SETDATE
SET EXACT
SET PROCEDURE

RETURN
IF ENDIF
DO CASE

પરિશિષ્ટ '૧૩'

કામકાજ ક્રમાંક ૨ (૧૩)

Three Year Degree Course in Law

(In force from June, 1997)

First LL.B.

Monsoon Semester

Paper I : Law of Crimes 100 Marks
Paper II : Low of Torts 100 Marks
Paper III : General Principles of Contract (Section 1 to 75 of the Indian contract) and the Law relating to Indemnity, Guarantee, Bailment and Agency 100 Marks

Winter Semester

Paper IV : Company Law 100 Marks
Paper V : Special Contracts : (Negotiable Instruments Act, Sale of Goods Act, Indian Partnership Act, and Law Relating to Trade Mark) 100 Marks
Paper VI : Constitutional Law of India 100 Marks

Second LL.B.

Monsoon Semester

Paper I : Hindu Law 100 Marks
Paper II : Law of property and Easements Transfer of property Act (80 Marks) Indians Easement Act (20 Marks) 100 Marks
Paper III : Administrative Law 100 Marks

Winter Semester

Paper IV : Legal Theory (Jurisprudence) 100 Marks
Paper V : Mohammedan Law Indian Succession Act (Section 1 to 191 and Indian Divorce Act 100 Marks
Mohammedan Law (50 Marks)
Indian Succession Act (25 Marks)
-Indian Divorce Act (25 Marks).
Paper VI : Law of Income Tax etc. 100 Marks
Income Tax Act (70 Marks)
Wealth Tax Act (15 Marks)
Gift Tax Act (15 Marks)

OR

Labour Laws 100 Marks
Industrial disputes Act, 1947
Bombay Industrial Relations Act, 1946
Factories Act, 1948
Workmen's Compensation Act, 1923
Employees State Insurance Act, 1948
Employees Provident Fund Act, 1952

Third LL.B.

Monsoon Semester

Paper I : Equity Trusts and Specific Relief Act 100 Marks
Equity (25 Marks)
Trusts (40 Marks)
Specific Relief Act (35 Marks)
Paper II : Criminal Procedure Code 100 Marks
Paper III : Law of Evidence 100 Marks

Winter Semester

Paper IV : Code of Civil Procedure Arbitration and Limitation 100 Marks
Code of Civil Procedure (65 Marks)
Arbitration Act (20 Marks)
Limitation Act (15 Marks)
Paper V : Drafting of Documents : 100 Marks
-(Sale Deed, Mortage Deed, Lease Deed, Gift Deed, Promissory Note, Power of Attorney, will Partnership Deed).
Pleadings, Professional Ethics, Advocates Act, 1961 and Practical Training Designed to Develop Legal Skill and Craftsmanship Namely Moot Courts, Legal Method, Legal Research, Court visits.
Paper VI : Legal Language including Legal writing demanding competence from the students for using English as well as the local Language for Transfacting Legal business and proficiency in English for the purpose of effective Legal Practice. 100 Marks

પરિશિષ્ટ '૧૪'

કામકાજ ક્રમાંક ૨ (૧૪)

M.A. Part I : Political Science

New Course in force from June, 1997

Paper I : Indian Politics
Paper II : International Politics
Paper III : Modern Political Theory
Paper IV : Comparative Politics.

Paper I : Indian Politics

1. Features and problems of Politics in developing countries with special reference to India.
2. Foundations of Indian Politics : Historical, Geographical, Social, Economic, Ideological and Cultural; Political Culture in changing context; Changing nature of Indian State.
3. Problems and processes of national integration : Major issues and events (focus should be on current issues of integration); Major areas of stresses and strains in national integration in India.
4. Constitution and government : Main features such as, fundamental rights, federalism and parliamentary democracy; Leadership in India, changing patterns, party system and major political parties; Elections, emerging Trends; Interest groups and pressure groups; press and public opinion
5. Politics of economic development : Strategies of economic development; models, performance and problems; liberalization and economic reforms and its implications for Indian Politics.
6. India and The World : Bases of Indian foreign policy; Non-alignment : Principles, implementation and present relevance: India and super powers; India's relations with neighbouring countries; India and the United Nations, Indian approach to Peace keeping.

Recommended Reading : English

1. Surendra Grover : 'Indian Government and Politics'
2. Rajni Kotheri : 'Politics in India'
3. D. C. Gupta : 'Indian Government and Politics'
4. P. Sharma : 'Government and Politics in India'
5. K. M. Panikkar : 'Foundations of India'
6. B. R. Sharma : 'Socio-Economic Justice under Indian Constitution'
7. Granville Austin : 'The Indian Constitution : Coreer stone of a nation'
8. Atul Kohli : 'Democracy and Discontent'
9. Paul Brass : 'Ethnicity and Nationalism'
10. K. D. Desai (Ed.) : 'Development Strategies : Search for Alternatives'
11. A. P. Rana : 'Imperatives of Non-alignment'
12. Ramesh Thakur : 'The Government and Politics of India'
13. Babulal Fadia : 'ભારતીય રાજનીતિ ઔર સરકાર'

(Note : Reading of contemporary and relevant literature like articles in periodicals and news papers is desirable specially for topics).

ગુજરાતી

1. સંઘવી, દેસાઈ, ગાંધી : 'સ્વરાજ દર્શન' (જ્ઞાનગંગોત્રી ગ્રંથ શ્રેણી)
2. રજની કોઠારી (અનુ. પ્રવીણ શેઠ, દિનેશ શુક્લ) : 'ભારતનું રાજકારણ' (ગ્રંથ નિર્માણ બોર્ડ)
3. દિનેશ શુક્લ, હસમુખ અમીન પ્રવીણ શેઠ : 'ભારતીય રાજકારણની રૂપરેખા' (ગ્રંથ નિર્માણ બોર્ડ, ત્રીજી આવૃત્તિ)
4. : 'ભારતનો બંધારણીય વિકાસ' (ગ્રંથ નિર્માણ બોર્ડ, બીજી આવૃત્તિ)
5. ધોળકિયા–પરીખ : 'ભારતના સંવિધાનનો કાનૂન' (ગ્રંથ નિર્માણ બોર્ડ)

6. દિનેશ શુક્લ : 'લોકશાહીની આસપાસ' (વિશ્વમાનવ પ્રકાશન)
7. દોલતરાય પી. નાયક : 'ભારતનો બંધારણીય કાયદો' (ગ્રંથ નિર્માણ બોર્ડ)
8. એ. પી. રાણા (અનુ.) સિદ્ધાર્થ ભટ્ટ : 'બિનજોડાણના આજ્ઞાર્થો' (ગ્રંથ નિર્માણ બોર્ડ)
9. બી. સી. શાહ : 'ભારતની વિદેશનીતિ' (ગ્રંથ નિર્માણ બોર્ડ)
10. હસમુખ પંડ્યા : 'ભારતીય સરકાર અને રાજકારણ' (સાબરી, ૧૯૮૬)

(નોંધ.–ખાસ કરીને ત્રીજા ટોપિક માટે સાંપ્રત અને પ્રસ્તુત સાહિત્ય જેમ કે સામયિકો અને અખબારોમાંના લેખોનું વાચન ઇચ્છનીય છે.)

Paper II : International Politics :

1. International Politics : International Relations Foreing Policy and International Politics Similarities and differences; approaches to the study of International Politics, problems in the study, problem of units and levels of analysis in the study of International Politics.
2. Actors in international politics : states as international actors, diminishing relevance of states as actors ? Power, capability and influence, bases of national power, recent trends in relation to elements of national power: Non-State actors in international politics, role and increasing relevance, types of non state actors.
3. International Political Systems : evolution and types; Balance of Power : Unipolar, bipolar and multipolar systems; sources of stability and change in international political system, Regional systems and UNO : characteristics : Non-Aligment Movement
4. The purposes of states : foreign policy goals and strategies.
5. Relations between states : instruments of influence, diplomacy, economic instruments of coercion and reward strategies, war as an instrument of national policy
6. Nuclear Weapons, and its role in international politics disarmament and arms control; START, NPT and CTBT.
7. International politics after the second world war : Cold War, Detente, Second Cold War, end of Cold War; Post Cold War international politics.
8. Relations between developed countries and between developed and developing countries : Interdependence and its impact, Dependency theory, thirt world strategies of development: Basic needs theory, self reliance as a strategy, New Inter-national Economic Order, GATT and WTO; Environment in international politics.

Recommended Reading

1. Brian Hocking and Michael Smith : 'An Introduction to World Politics'
2. K. J. Holsti : 'International Politics : A Framework for Analysis' (Seventh Edition)
3. Bruce Russetand Harvey Starr : 'World Politics-The Menu for Choyced'
4. T. A. Columbis and J. M. Wolte : 'Introduction to International Relations Power and Justice'
5. Hedley Bull : 'Anarchical Society
6. Jones Walters : 'The Logic of International Relations'
7. John Spanser : Games Nations Play'
8. Fred Maliday : 'The Making of the Second Cold War'
9. Little, Shackelton and Smith : 'Perspectives on World Politics'
10. A. P. Rana : 'The Imperatives of Non-aligament'
11. Peter Willets : 'The Non-Aligned Movement - The Origins of a Third World Alliance'
12. Adam Roberts and Benedict Kingsbury (Ed.) : 'United Nations, Divided world : The UNS Roles in International Relations'
13. Dougherty and Pfaltzgraff : 'Contending Theories of International Relations'
14. Martin Hollis and Steve Smith : 'Explaining and Understanding International Relations'
15. Michael Donelan : 'Elements of International Political Theory
16. Richard Mansbach, Yale Ferguson and Donald Lampert : 'The web of world Politics : Non-state Actors in the Global System'

Paper III : Modern Political Theory :

1. Theory and Ideology-role, nature and importance

- Perspectives on State : absolutist, liberal--democratic and welfare state-changing concept
- [illegible] as an organization of public power.
3. State, Civil Society and Legitimacy-Habermas's Theory of Legitimation Crisis.
4. Power-Perspectives on Power (State Power) : Lasswell and George Catlin-critique of Po[illegible] Foucault and Gandhi.
5. Democracy, nation-state and global order-Reconstruction : foundations of democra[illegible] rethinking democracy-problems of democracy-cosmpolitan democracy-rethinking wo[illegible] order in the context of democracy.

Recommended Reading

1. Vincent A. : 'Theories of State'
2. Winthrop N. : 'Liberal Democratic Theory and its Critiques'
3. Giddens A. and Turner J. (Ed.) : 'Social Theory Today'
4. Dahl R. : 'Problems of Pluralist Democracy'
5. Foacault M. : 'Power and Knowledge'
6. Burns, Edward McNall : 'Ideas in Conflict, The Political Theories of the Contemperoray Wo[illegible]
7. Catlin George : 'Political Theory—What is it ?'
8. Russell B. Poer : 'A new Social Analysis'
9. Lasswell H. and Kaplan A. : 'Poer and Society : A framework for Political Inquiry'
10. Brecht Arnold : 'Political Theory : The Foundations of Twentieth Century Political Thoug[illegible]
11. Sethi J. D. : 'Gandhi Today'
12. Caitong John : 'Gandhi Today'
13. Held David : 'Political Theory Today'
14. Held David : 'Democracy and Global Order'
15. Chandoke Neera : 'State and Civil Society'
16. Habermas : 'The Legitimation Crisit'
17. Holub Robert : 'Habermas'
18. Rasmussen David : 'Reading Habermas'
19. International Encyclopaedia of Social Sciences (Ed ward Shivs : Political Idelology).

Paper IV : Comparative Politics :

1. Nature of Politics.
2. The study of comparative Politics : Growth and importance of its study.
3. Major Approaches . Traditional Politics and behavioral Politics, Post-Behavioralism.
4. Major concepts and terms (i) Politicisation (ii) De-Politicisation-Alienation, (ii[illegible] Mobilisation (iv) Political Recruitment (v) Political Culture (vi) Political Socialisation (vi[illegible] Political Style (viii) Institutionalisation (ix) Political Communication (x) Politic[illegible] Participation.
5. Political systems : Concept and Model, Major typoloies of political system (Easto[illegible] and Almond).
6. Constitutional governments : fundamental rights, comparative perspective of Federal syste[illegible] in India and U.S.A.
7. Legislature : Committee system in U. K. U.S.A., India and France : Structure and Process[illegible]
8. Executive : Parliamentary and presidential forms of Government : Theory and practic[illegible] Role of the Prime Minister and the President; The French Executive.
9. Judiciary : Judicial System in India and U.S.A., Judicial Review-Indian and American experience.
10. Interest articulation : Types of interest groups and pressure groups in India, U.S.A. and U.K[illegible]
11. Interest aggregation : Processes-Parties in democracy and dictatorship-Parties [illegible] developing countries.
12. Political culture in India, China and U.S.A.

Recommended Reading : English

1. Almond and Powell : 'Comparative Politics : A Developmental Approach'
2. Gabriel Almond : 'Comparative Politics'
3. J. C. Johari : 'Comparative Politics'
4. Ibale : 'Political Science-An Introduction'

5. Jayanti K. Patel : 'Party system and Political development in Africa and India' A Comparative Perspective in India [illegible] Ramchandam
6. Robert Dahl : 'Modern Political Analysis'
7. Lawrence C. Mayer John H. Burnet, Suzanne Ogden : 'Comparative Politics-Nations and Theories in a changing world'
8. Roy and Mc Rides (Ed.) : Modern Political Systems [illegible]
9. Rod Hague, Martin Harrop and Shaun Breslin : 'Comparative Government and [illegible]'

હિન્દી

૧. કે. સી. જોહરી : 'તુલનાત્મક રાજનીતિ'
૨. પી. ડી. શર્મા : 'તુલનાત્મક રાજનીતિ'
૩. શ્યામલાલ વર્મા : 'આધુનિક રાજનીતિક [illegible]'
૪. ગર્ગવાલ ઔર પાંડેય : 'આધુનિક રાજનીતિક વિશ્લેષણ'
૫. ગેના : 'તુલનાત્મક રાજનીતિ સંસ્થાએં'.

ગુજરાતી

૧. પ્રવીણ ન. શેઠ : 'તુલનાત્મક [illegible]'
૨. પ્રવીણ ન. શેઠ : 'આધુનિક રાજ્યશાસ્ત્ર [illegible]'
૩. હસમુખ પંડ્યા : 'રાજકીય પ્રશ્નોનું [illegible]'
૪. રોબર્ટ ડેહલ (અનુ. બી. સી. શાહ, જે. એન. પંડ્યા) : 'આધુનિક રાજકીય વિશ્લેષણ [illegible]'
૫. દિનેશ શુક્લ, હસમુખ અમીન : 'ભારતીય રાજ્યશાસ્ત્રની રૂપરેખા' [illegible]).

M.A. Part II : Political Science

New Course in force from June [illegible]

All students of M.A. II examination have to select four papers from [illegible] mentioned below (Out of 15).

However a regular student of the department of Political Science [illegible] Social Science may offer dissertation with the consent of faculty [illegible] Department of Pol[illegible] in lieu of one paper (of 100 Marks)

Paper I	Political Thinkers
Paper II	Modern Political Ideologies
Paper III	American government and Politics
Paper IV	Research Methodology
Paper V	Public Administration
Paper VI	European Regional International Organization
Paper VII	Afro Asian Regional International Organization
Paper VIII	State Politics in India (with special reference [illegible])
Paper IX	Politics of Environment in India
Paper X	West and East Asia
Paper XI	American and Russian foreign policy
Paper XII	Indian Foreign Policy
Paper XIII	American Political Thought
Paper XIV	Modern Indian Political Thought
Paper X[illegible]	Human Rights in [illegible] and [illegible]

Paper I : Political Thinkers :

(1) Plato (2) Thomas Hobbes (3) John Stuart [illegible]

Recommended Reading : English

1. Barker : 'Greek Political Theory Plato and his [illegible]'
2. Davidson : 'Political Thought in England'
3. G. [illegible] Sabine : 'A History of Political Theory'

4 D. D. Raphael 'Hobbes, Morals and Politics'
5 Leo Strauss 'The Political Philosophy of Hobbes'
6 C. B. Macpherson 'The Political Theory of Possessive-Individualisun'
7 W. Ebenstein 'Great Political Thinkers'
8 J. S. Mill 'On Liberty'
9 J. S. Mill 'On Representative Government'
10 Avineri 'Social and Political Thought of Karl Marx'
11 Sidney Hook 'From Hegel to Marx'
12 M. Evans 'Karl Marx'
13 N. Danielsood 'Reading Rawls'
14 M. Walzer 'Spheres of Justice'
15 Rawls 'Concept of Justice'.

ગુજરાતી પુસ્તકો

[illegible] 'પ્લેટોનું આદર્શ નગર'
દિનેશ શુક્લ : 'આધુનિક [illegible]'
[illegible]
[illegible] 'પાશ્ચાત્ય રાજકીય વિચારધારા'
[illegible] 'કાર્લ માર્ક્સ'
[illegible] 'રાજનીતિક સિદ્ધાંતનો ઇતિહાસ'
[illegible] 'ગાંધી અને માર્ક્સવાદ'
[illegible] 'માર્ક્સ અને ક્રાંતિનું વિજ્ઞાન'
[illegible] 'જહોન સ્ટુઅર્ટ મિલ'
[illegible]

Paper [illegible] Political Ideologies :

[illegible] and its evolution Martin Seliger's definative and model-attributes [illegible] of Enlightenment andits achievements and the role of Reason in the [illegible] Marx's views on Ideology

[illegible] Liberal [illegible] non-liberal views on State and liberty-Bentham and the [illegible] Principle-Mill's thoughts on liberty and representative government-F. A. Hayek and the Constitution of Liberty-Robert Nozick's views on State

(c) Socialism : Socialist ideas before Marx-Feuerbach's views on god and religion-basic principles of Marxian Socialism-post Marxian thought in the 20th Century : Critical Theory Frankfurt School-Horkheimer-Marcuse and the 'One Dimensional Man'—Habermas and the Theory of Communicative action

(d) Contemporary debate : Daniel bell and the 'End of Ideology' and Francis Fukuyama and the End of History

(e) Nationalism and Internationalism

Recommended Reading : English

1 Hall Stuart and Gieben Bram (Ed.) 'Modernity and its formations'
2 Hall, Held and McGrew (Ed.) 'Modernity and its futures'
3 Kolakowski L. 'Main currents in Marxism Vol. 1, 2 and 3'
4 Held David 'Introduction to critical theory'
5 Holub Robert 'Habermas'
6 Hayek F. A. 'The constitution of liberty'
7 Nozick Robert 'Anarchy and Utopia'
8 Arblaster A. 'The rise and decline of Western Liberalism'
9 Gray J. 'Liberalism : Essays in political Philosophy'
10 Bottomore Tom 'The Frankfurt School'
11 International Encyclopedia of Social Sciences (Edward Shils : Political Ideology

ગુજરાતી

[illegible] 'માર્ક્સવાદ'
પટેલ [illegible]

૩. દવે નવનીત : 'જે. એસ. મિલ'
૪. વાયડા રણછોડભાઈ : 'આર્ષદ્રષ્ટા માર્ક્સ'
૫. શુક્લ દિનેશ (અનુ.) : 'સ્વાતંત્ર્યના રાહ'
૬. પટેલ હસમુખ : 'કાર્લ માર્ક્સ'
૭. જ્ઞાનગંગોત્રી શ્રેણી : 'વિચારદર્શન'
૮. ભટ્ટ સિદ્ધાર્થ અને પંડ્યા હસમુખ : 'રાજનૈતિક સિદ્ધાંતોનો ઇતિહાસ'
૯. 'દર્શક' મનુભાઈ પંચોલી : 'બે વિચારધારાઓ'
૧૦. પારેખ નગીનદાસ (અનુ.) : 'ગાંધી દર્શન'
૧૧. માવળંકર પુરૂષોત્તમ (અનુ.) : 'વિચારધારાનો યુગ'
૧૨. શુક્લ દિનેશ : 'વિચારધારા' પર્યાય, ૧૯૯૬
૧૩. પરમાર વાય. એ. : 'કાંકરૂં વિચારધારા'
14. International Encyclopaedia of Social Sciences (Edward)

Paper III : American Government and Politics :

1 Constitution : Underlying purposes, antimajoritarianism limited government and individual rights, Transformation of original purposes
2 Pluralism : Minorities and race relations, Civil Rights movement, Women in Politics
3 Political Participation : Interest Groups, Political Action Committees, Public Opinion, Citizen Activism.
4 Political Parties, Evolution of Party System : Two Party System, Democratic and Republican Party : Socio-economic basis of the parties, Minor Parties, Party Organizsation and dynamics
5 Electoral Process, Primaries, Conventions and National Convention, Campaigning and Resources, Elections and Voting behaviour
6 Federal System : Evolution, Role of Judiciary, Centre-State Relations, Co-operative Federalism, Mechanism for Conflict Resolution
7 Presidential System : President, his role and powers, Cabinet, Bureaucracy, Policy-Making process
8 Congress : Organization and role, committee system, Executive-Congressional relations
9 Judiciary, Judicial System-Supreme court as a political instrument, Judicial Review, Judicial Activism and Judicial Restraint
10 Contemporary issues in American Politics

Recommended Reading

1 Adrain Charles R. and Charles Press : 'The American Political Process' New Delhi, Atlantic Publishers & Distributors 1995
2 Almond Gabriel A. and Sidney Verba : 'The Civil Culture Revisited' New Delhi, Sage Publication, 1989
3 Archer J. C. and Taylor P. J. : 'Selection and Party : A Political geography of American Presidential Elections from Andrew Jackson to Ronald Reagan' Chichester, U. S. A. 1981
4 Chambers, W. N. and Burnham W. D. (Ed.) : 'The American Party System Stages of Political Development' New York & London
5 Duchacek I. D. : 'Comparative Federalism : the territorial dimention of Politics' New York : Holt Reinhard & Winston, 1970
6 Elazar, D. J. : 'American Federalism : A view from the States' 3rd edition New york, Harper & Row, 1984
7 Griffith Ernest S. : 'The American System of Government' 6th edition, London, Routledge 1991
8 Handler Joel and Yeleskı Hasenfield : 'The moral Construction of Poverty Welfare reforms in America' New Delhi Sage Publications, 1991
9 Harris, Fred R. : 'Deadlock or decision : The U. S. Senate and rise of national politics' U S A. Oxford University Press, 1993
10 Jamieson Kathleen H. : 'Dirty Politics, Deception, Distraction and Democracy' U. S. A. Oxford University Press 1992
11 Kallenbach, J. E. : 'The American Chief Executive The Presidency and the Governorship' New York, Harper and Row, 1966

12. Kane, J. W. : 'The Chief Executive' 4th edition, New York, Harcourt Brace Jonanouich, 19
13. Lacey, Michael J. (Ed.) : 'The Truman Presidency' Cambridge, Cambridge Univ Press, 1989
14. Lane, Jane-Erik : 'Polities and Society in Western Europe' New Delhi, Sage Publications,
15. Ladd, E. C. Jr. with Hadley D., : 'Transformation of the American Party System' edition, New York, Norton, 1978
16. Lavrakas, Paul J. and Jack K. Holley, : 'Polling and Presidential election coverage' Delhi, Sage Publications, 1991
17. Lowi, Theodore, J. and Allan Stone : 'Nationalizing the Government : Public Politic America' New Delhi, Sage Publications, 1970.
18. Maidment, Richard and Anthony McGraw : 'The American Political Process' New D Sage Publications, 1991.
19. Mayer, Thomas (Ed.) 'The Political Economy of the American Monetary Po Cambridge, University Press, 1993
20. Mcsweeney, Dean and zvesper, John : 'American Political Parties : The formation, de and reform of the American Party System' London, Routledge, 1991.
21. Milkis, Sidney M. : 'The President and the parties : The transformation of the Ame Party System since the New deal' U.S.A. Oxford University Press, 1993.
22. Orren, Karren, 'Belated Feudalism : Labour, the law and the liberal development in United States' Cambridge, Cambridge University Press, 1992.
23. Pious, R. .The American Presidency' New York, Basic Books, 1979.
24. Rothenberg, Laurence S. : 'Linking citizens to Government : Interest, groups politic common cause' Cambridge, Cambridge University Press, 1991.
25. Segal, Jeffrey A. : The Supreme court and the Attitudinal Model' Cambridge, Cambr University Press, 1993
26. Vile, M. J. 'Politics in the U.S.A.' London, Routledge, 1987.
27. Williams, Robert (Ed.) 'Explaining American Politics : Issues and Interpretatio London, Routledge, 1990.

Paper IV : Research Methodology :

1. Meaning, objectives, motivation in Research; Research Problems, Research Des Research Process, Hypothesis and Hypothesis Testing.
2. Methods of collection of Data, Primary and secondary Data, Interview, Questionna and Schedule
3. Sampling Types of Sampling, sample design; scaling; Meaning and Techniques
4. Statistics in Research Measure of Central Tendency : Mean, Median, Mode, Dispersi Correlation, Probability, Statistical Testing, Chi-sauarred Testing, Indexes, Time-seri variance, regression skewness Analysis.
5. Presentation of Data Use of tables: chart, Histrgram; Graph, Polygon.
6. Interpretation and Report Writing

Recommended Reading : English

1. Russel Ackoff 'The Design of Social Research'
2. Allen T. Harell : 'New Methods in social Science Research'.
3. T. W. Anderson : 'An Introduction to Multivariante Analysis'.
4. C. R. Kothari 'Research Methodology-Methods and Techniques'.

ગુજરાતી પુસ્તકો

૧. ડૉ. નરબન્સ પટેલ : 'રાજ્યશાસ્ત્ર વિજ્ઞાપન સંશોધન પદ્ધતિઓ'.
૨. ડૉ. વિમળ પી. શાહ અને પ્રા. તારાબહેન પટેલ : 'સમાજશાસ્ત્રમાં સંશોધન પ્રવૃત્તિઓ અને આંકડાશાસ્ત્રીય પૃથક્કર
૩. પ્રવીણ ન. શાહ : 'તુલનાત્મક રાજકારણ'.

Paper V : Public Administration :

1. Nature and scope of Public Administration : Public and Private Administratio Significance of Public Administration; Trends in Public Administration.

2. Comparative Public Administration : Concept and Typlogy; New Public Administration : features and significance; Developmental Administration.
3. Principles of organization : Hierarchy, Span of control, Unity of command and Specialization; Centralization and decentralization.
4. Formal and Informal Organizations : A brief survey of therries; Role of informal organizations and the relationship between formal and informal organizations.
5. Chief Executive; Middle Management, Field Administration: District collector and District Development Officer in India; Main features of Urban and rural local self governments in India and their major problems.
6. Public Corporations and Independent Regulatory Commissions; Structure, features, role and working of Public enterprises in India.
7. Personnel Administration : Bureaucracy and Civil Service, Major issues in civil Service : Generalists and Specialists, Neatrality of Civil Service, and Anonymity, Representative Bareaucracy; Main features of structure of Public Services in India
8. Financial Administration : budgetory Process and Financial control in U.S.A. and India; performance budgeting; effectiveness of parliamentary control in financial affairs in relation to executive, role of Auditor and comptroller General of India
9. Control over administration : Committees of parliament; Ombudsman, Lokpal and Lokayakta; control by executive and the issue of relationship between Politicians and Civil Servants; Judicial control over administration.
10. Corruption in Public Administration : Theories regarding corruption; suggested solutions of the problem of corruption.

Recommended Reading : English

1. A. Avsthi and Maheswari : 'Public Administration'.
2. Rumki Basu : 'Public Administration : Concepts and Theories'.
3. Covson and Harris : 'Public Administration in a Modern Society'.
4. R. T. Golembiswski : 'Public Administration as a Developing Discipline'
5. P. Heady : 'Public Administration : A Complarative Perspective'.
6. Felix Nigro : 'Modern Public Administration'.
7. Dwight Waldo : 'The Study of Public Administration'.
8. Stahl Gleen : 'Public Personnel Administration'.
9. Ashok Chanda : 'Indian Administration'.
10. S. R. Maheswari : 'Indian Administration'.
11. Ravindra Prasad, V. S. Prasad and Satyanarayana (Eds.) : 'Administrative Thinkers'
12. V. A. Pai Panandikar (Ed.) 'Development Administration in India'.
13. R. S. Arora : 'Administration of Government Enterprises'
14. M. J. Thavraj : 'Financial Administration of India'.
15. Om Srivastava : 'Public Administration and Management' Vols. I and 2
16. Relevant issues of : 'Indian Journal of Public Administration'

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૧. શ્રીવિહર દેસાઈ : 'રાજ્ય વહીવટના સ્વરૂપ' (ભાગ ૧ અને ૨).
૨. હસમુખ પંડ્યા : 'જાહેર વહીવટ' (ભાગ ૧ અને ૨).
૩. સિદ્ધાર્થ સ્વામિનારાયણ : 'જાહેર વહીવટ'

Paper VI : European Regional International Organization :

1. Various approaches to the integrationist Theory : The pluralist Approach, Functionalism Neo-Functionalism, Varieties of Federalist theory
2. Historical background to the EEC, the EEC Treaty, Institutions of the EEC : the Assembly the council, the commission and the court of Justice.
3. Impact of EEC and policy formulation in different areas
4. Attitude of various states towards EEC and European Integration
5. 1992 initiative : Causes and consequences

6. Problems and prospects : The problems of Enlargement; The problem of National Government, Territory VS Electorate, The Problem of Representation, EEC as a federal model : achievements and failures.

Recommended Reading

1. Charles Pentland : 'International Theory and European Integration'.
2. Alberta M. Sbragia (Ed.) : 'Euro-Politics : Institutions and policy Making in the New European Community'.

Paper VII : Afro-Asian Regional International Otganization :

1. The Regional Focus in international Relations : Security and Developmental concerns of Developing states. Extraregional, Regional, National and sub-national sources of insecurity and incentives and disincentives for Developmental concerns.
2. Security and Regional Organizations : Extra-regional, Regional, National and sub-national sources of Insecurity and the origins and evolution of O AU, ASEAN and SAARC; similarities and differences-Security Principles and provisions of OAU, ASEAN and SAARC.
3. Development and Regional Organization. Extra-regional, Regional, National and Subnational incentives and disincentives : similarities and differences. Development principles and programmes of OAU, ASEAN and SAARC.
4. Successes and Failures of Afro-Asian Regional Organization : similarities and differences and the causes there of.
5. The future of Regional Organization in Africa and Asia : emerging constraints and opportunities.

Recommended Reading

1. L. J. [illegible] and S. L. Spiegel (Eds.) : 'The International politics of Regions'.
2. Richard Falk and Saul Mendlowitz (Eds.) : 'Regional politics and world order'.
3. E. [illegible], J. Certzman and A. K. Bhattacharya : 'Regional co-operation among Developing Countries, The New Imperatives of Development in 1985'.
4. A. Br[illegible]nowsky (Edi.) : 'Understanding ASEAN'.
5. Zdenek Cervenka : 'The Unfinished Quest for Unity : Africa and OAU'.
6. [illegible] Muni : 'Regional co-operation in south Asia'.
7. Bimal Prasad (Edi.) : 'Regional Co-operation in South Asia'.
8. Bhabani Sengupta (Edi.) : 'Regional Co-operation and Development in South Asia' Vol. 1 and 2.
9. Bhabani Sengupta (Edi.) : 'SAARC-ASEAN-Prospects and Problems of Inter regional Co-operation'.
10. Charan D. Wahdva etc : 'Regional Economic-Co-operation in Asia : Bangladesh, India, Pakistan and Srilanka'.

Journals

1. Asia Quarterly (Relevant issues), New Delhi.
2. South Asian Review (Relevant issues), Jaipur.

Paper VIII : State Politics in India (With special reference to Gujarat) :

Approaches, concepts and Methods of Analysing State Politics :

1. Significance of the Study of State Politics; Linkages between national Politics and state politics-Role and Place of Gujarat in national Politics and its impact on federalism in India.
2. Salient Features of state Politics.
3. Determinants of state Politics-major themes.
4. Geographical, Economic and Social foundations of Gujarat Politics-Political culture of Gujarat.
5. Governmental experience since 1972-Chief Minister and their governmental performance.
6. Party system in Gujarat-major parties-electoral trends in Gujarat with special reference to Assembly polls of 1967, 1975, 1980 and 1995.
7. Mobilization : caste and Politics in Gujarat-Politics of Harijan, Advasi, OBCS and Muslims.
8. Movements : Mahagujarat movement-Navnirman movement-Anti-reservation Agitations (1981 and 1985) communal Tensions in Gujarat.
9. Pressure groups in Gujarat : Farmers Politics, Oil Lobby (Saurastra) their dominance in Gujarat Politics-role of business and industry in Gujarat Politics.

10. Dynamics of Development : Nature, Prospects and problems of development-Role of NGOS in Gujarat.

Recommended Reading : English

1. P. N. Sheth : 'Patterns of Political Behaviour in Gujarat'.
2. Iqbal Narain : 'State Politics in India'.
3. Pathak & Others : 'Three general elections in Gujarat'.
4. P. N. Sheth : 'Navnirman Movement and Political change'.
5. Ghanshyam Shah : 'Protest Movement in Two Indian States'.
6. Babulal Fadia : 'State Politics in India'.
7. Ghanshyam Shah : 'Caste Mobilization in Gujarat'.
8. Pravin N. Sheth and Ramesh Menon : 'Caste and communal Time Bomb'.
9. Poona Wignaraja Edited : 'New Social Movements in the South-Empowering The People'.
10. Ghanshyam Shah : 'Social Moements in India' A Review of Literature.
11. Nagindas Sanghavi : 'Gujarat A Political Analysis'.

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૧. મનહર જે. બક્ષી : 'ગુજરાતનું રાજકારણ' (યુનિવર્સિટી ગ્રંથનિર્માણ).
૨. કુન્દનલાલ ધોળકિયા : 'સમયને સથવારે : ગુજરાત' (બીજી આવૃત્તિ).
૩. શિરીષ પંચાલ (સંપાદન) : 'સ્વાતંત્ર્યોત્તર ગુજરાત'.
૪. બ્રહ્મકુમાર ભટ્ટ : 'લે કે રહેંગે ગુજરાત'.
૫. જયંત પંડ્યા : 'ગુજરાતમાં પંચાયતી રાજ'.
૬. ગુજરાત વિધાનસભા (સચિવાલય) : 'લોકશાહીના ધબકારા'.
૭. પાઠક, પારેખ, દેસાઈ, શેઠ : 'ચોથી ચૂંટણી-ભારતમાં અને ગુજરાતમાં'.
૮. દિગંત ઓઝા (સંપાદન) : 'એજન્ડા ફોર ગુજરાત' ભાગ ૧-૨.
૯. જોસેફ મેકવાન, ચંદુ મહેરિયા (સંપાદન) : 'અનામતની સમસ્યા'.
૧૦. પ્રવીણ શેઠ : 'ચૂંટણી અને રાજકીય પરિવર્તન'.
૧૧. પ્રવીણ એન. શેઠ, અનુ. મનોજ સોની : 'ગાંધી વિચાર અને પર્યાવરણ'.

Paper IX : Politics of Environment in India :

1. Environment in Indian Tradition : The State of India's Environment : Major Problems.
2. Socio-economic Dimensions of Enviro-degradation : Impact on the poor and women.
3. Role of the State; Ministry of Environment and Forests-Pollution Control board-Enviro-Policy making and Implementation-(High Politics)-Limitations.
4. The Green Court-Major cases of Disputes over Pollution and Environmental degradation-Role of the Government and Economic interests.
5. Conflicts over Natural Resources : Environmental Movements in India (Major cases)-issues, Interest Groups and Environmental NGOs-Impact on the political System.
6. Politics of the Narmada Project-Issues of Environment and Development-Role of the States, the Centre and NGOs.
7. Potentials of Environmental Politics in India-Green Development : Toward Sustainability with Justice.

Recommended Reading

1. Geeti Sen (Ed.) : 'Indigenous Vision : Peoples of India-Attitudes to the Environment' (Sage Pub. 1992).
2. Vandana Shiva : 'Ecology and Politics of Survival' (Sage Pub., 1990) (Useful)
3. Pravin Sheth : 'Narmada Project : Politics of Eco-Development' (Har-Anand Pub., 1994) (Very useful).
4. Pravin Sheth : 'Theory and Praxis of Environmentalism' (Navjivan Press, 19[illegible])

5. Pravin Sheth : 'Politics of Narmada Project-Role of the States and NGOs (MP Institute of Social Science Research, Ujjain, 1995).
6. Pravin Sheth : 'Environment and the Indian Political System' (Rawat Pub.1997) (Very useful-covers all the topics).
7. Fisher, William F. (Ed.) : 'Toward Sustainable Development' (Armonk, N.Y. : M. E. Sharpe, 1995) (Articles of Anil Patel, Medha Patker).
8. Ashish Kothari and Rahul Ram : 'Environmental Issues Related to Sardar Sarovar Project' (Narmada Forum, Delhi, 1991).
9. Annapurna Nautiyal (Ed.) : 'India and the New World Order, Part two' (South Asian Pub., New Delhi, 1995).
10. Vandana Asthana : 'Politics of Environment (useful)' (Ashish Pub., New Delhi, 1992).
11. Lester B. Brown et. al : 'The State of the World Report' (1983, 1990, 1992, 1995), (Very useful).
12. Wolfgan Sachs (Ed.) : 'The Development Dictionary, (Zed Books, London, 1992).
13. V. A. Vyas et. al. (Eds) : 'Politics and Environment' (1998).

Journals

1. The hindu Survey of the Environment, 1993, 1994, 1995 and 1996 (Very useful).
2. Down to Earth (Fortnightly-relevant issues) Centre for science and Environment, New Delhi (Very useful).

Paper X : West Asia and East Asia :

1. Post Second World War West Asia-Political dilema in West Asia-Pan Arab Movement-West Asia and North African Arab Countries-OPEC-strategic instability in West Asia-Afghanistan Crisis-Dynamics of Neutralism in the Arab World.
2. Comparative foreign policies of countries of West Asia with reference to Iraq, Iran and Israel-Iraq-Iran conflict Gulf war-Ethnic conflicts in West Asia.
3. Post world war II East Asia-Foreign Policy of China-conflict and coperation in south East Asia-Regionalism-ASEAN : achievements and problems. APEC and other emerging experiments-the dynamics of economic nationalism in East Asia.

Recommended Reading

1. Caroline Thomas : 'In search of security-The Third world in International Relations'.
2. S. P. Verma : 'International System and the Third World'.
3. Stephen Krasher : 'Structural conflict The Third World Against Global Liberalism'.
4. F. A. Sayegh : 'The Dynamics of Nearalisam in the Arab World'.
5. Bhabanisen Gupta (Ed.) : 'SAARC-ASEAN-Prospects and problems of Inter-Regional co-operation'.
6. Otto Hieronymi (Ed.) : 'The New Economic Nationalism'.
7. Michael Brecher : 'The foreign policy system of Israel'.
8. Golan Galia : 'Yom Kippura and after'.
9. Jaseph Roschild : 'Ethnopolitics-A conceptual Framework'.
10. Doran Charles : 'Myth, Oil and Politics'.
11. Robin Wright : 'Sacred Rage-The Crusade of Modern Islam'.

Paper XI : American and Russian Foreign Policy :

Foreign Policies of America and Russia to be studied with reference to following points in the past-second world war period :

1. Setting : Emergence of Bipolar world; Cold War.
2. Factors in formulation : Bases of foreign policy; role of domestic and international factors in formulation, historical traditions and national style.
3. Agencies in formulation : Role of various Governmental agencies in formulations; role of parties, pressure groups and public opinion in formulation of foreign policy.
4. Evaluation of foreign policy : Evaluation of foreign policies of U.S. and Russia towards each other in various phases in America from Trueman Doctrine to the present and in case of Russia from stalin to the present; goals, and instruments; achievements and failures; continuity and change; American and Russian foreign policy in the post Cold War period.

5. Instruments of Policy : Military and non-military instruments of foreign policy, decline of American and Russian power its impact.
6. Foreign policy towards various regions : American and Russian foreign policy towards Third World, towards South Asia (with special reference to India), towards Europe.
7. American and Russian foreign policy towards the UN and regional organizations.
8. Convergence and divergence in American and Russian foreign policy.

Recommended Reading

1. Cecil Crabb (Jr.) : 'American Foreign Policy in the Nudear Age' (4th edition, 1983).
2. Cecil Crabb (Jr.) : 'Policy Makers and Eritics-Conflicting Thheories in American Foreign Policy.
3. John Spanier : 'American Foreign Policy since world War II' (11th edition, 1989).
4. Charles Kegley and Wittkopf : 'American foreign Policy-Patterns and Processes'.
5. Kissinger Henry : 'American Foreign Policy'.
6. Kissinger Henry : 'Diplomacy'.
7. Norman Graebner : 'America as a world power'.
8. Thowas McCormick : 'America's half century-United states Foreign Policy in the Cold War'.
9. Owen Harris : 'America's purpose-New visions of Foreign Policy'.
10. Melvyn Leffier : 'A preponderence of Power : National security, Trueman Administration and the Cold War'.
11. Mansfield and Buckeley (Eds.) : 'Conflict in American Foreign Policy'.
12. Willam Zimmerman : 'Soviet Prespectives on International Relations'.
13. Nogee and Donaldson : 'Soviet Foreign Policy since World War-II'.
14. Alvin Rubinstein : 'Soviet Foreign Policy since World War-II Imperial and Global'.
15. Robin Edmonds : 'Soviet Foreign Policy : The Brezchnev years'.
16. Seweryn Bialercedi : 'Inside Gorbachev's Russia'.
17. Kurt Campbell and Neil Macfarlane : 'Gorbachev's Third World Dilemas'.
18. John Girling : 'America and Third World'.
19. Alexander George and others (Edi.) : 'US-Soviet Securiy Co-operation'
20. Hartman and Wendzel : 'American Foreign Policy in a changing World'.
21. Harold Gould and Sumit Ganguly : 'The Hope and the Reality US-Indian Relations from Roosevelt to Reagan'.

Paper XII : Indian Foreign Policy :

1. Foreign Policy : Meaning, goals, instruments, approaches to the study of foreign policy.
2. Determinants of Indian Foreign Policy : External Environment and Domestic Environment; culture, society and Indian Foreign Policy; role. of parliament, cabinet, Military Establishment, Bureaucracy, Public opinion and pressure Groups in formulation of Indian Foreign Policy, role of personality factors and perception of external and internal environment.
3. Principles of India's foreign policy : Foreign policy of nonaligement : Meaning, implementation, evaluation; relevance of strategy of nonalignment in the Cold War and in the post Cold War period in relation to super powers and neighbours.
4. Evolution of India foreign policy from Nehru's time to the present-Instruments of Indian Foreign Policy; Weapons diplomacy and economic diplomacy.
5. India's relations with U.S.A. and Russia and China, relations with Pakistan; relations with smaller South Asian neighbours like Relation with South East Asian Countries.
6. India's Policy and role in relation to UNO and regional organizations of military as well as non-military nature; India and SAARC and ASEAN.
7. India's Foreign and Defence Policy, India's Nudear Policy, Trends and problems and opportunities in the context of changing strategic environment.
8. Evaluation of Indian Foreign Policy, continuity and change in Indian Foreign Policy specially in the post-Cold War period.

Recommended Reading : English

1. A. P. Rana : 'The imperatives of nonaligement'.
2. K. P. Misra : 'Non-Alignment Frontiers and Dynamics'.

3. Bimal Prasad : 'India's Foreign Policy-continuity and change'.
4. J. Bandopadhya : 'The Making of India's Foreign Policy'.
5. Krishan D. Mathur and P. M. Kamath : 'Conduct of India's Foreign Policy'.
6. K. P. Mishra : 'Janta's Foreign Policy'.
7. Sisir Gupta : 'India and the International System'.
8. Harish Kapur : 'India's Foreign Policy (1947-92)-Shadow and substance'.
9. A. P. Rana : 'Indo-Us relations'.
10. H. C. Shukul : 'Interpreting World Politics'.
11. Ramesh Thakur : 'The Politics and Economics of India's Foreign Policy'.
12. V. Longer : 'India's Defence and Foreign Policies'.

ગુજરાતી

૧. એ. પી. રાણા : "બિનજોડાણના આશયો' (અનુ. સિદ્ધાર્થ ભટ્ટ).

Journals

1. India Quarterly (relevant issues), New Delhi.
2. South Asian Review (Relevant issues) Jaipur.

Paper XIII : American Political Thought :

Students are expected to study certain themes of American Political Thought. The examination paper will be divided in two sections. Section A consisting of 60 marks will be based on questions regarding these themes. Section B consisting of 40 marks will be based on essays included in 'Federalist', the American Classic by Mamilton Madison, and Jay'.

Section A :

1. European heritage : The Colonial mind, Age of Reason, state and church from colonial times of present, American secularism.
2. Theories of American Revolution.
3. The democratic idea : Expansion and growth of democracy, class and status in American Society.
4. Capitalism : evalution and development; social Darwinism.
5. Reformism : revulsion from the gospel of wealth; Reformers, populists, Progressives.
6. Welfarism : New Deal to great society and after.
7. Minorities : Civil rights, Blacks in America, other minorities.
8. Culture, quality of life : Individualism, business ethos; role of government in society, affluence and poverty; cultural pluralism.

Section B :

From 'The Federalist'—Essays 1 to 85.

Recommended Reading

1. Jacob E. Cooke (Edi.) : 'The Federalist' Wesleyan University Press, 1961).
2. M. Canovan : 'Populism'.
3. Stanley Elkins : 'American Political Cultures'.
5. L. Goodwyn : 'The Democratic Promise : The Populist Movement in America'.
6. R. Hofstader : 'Anti-Intellectualism in American Life'.
7. Lawrence M. Levine : 'The Unpredictable Past-Explorations in American Cultural History'.
8. Gottfried Dietze : 'The Federalist-A Classic on, federalism and Free Government'.

Paper XIV : Modern Indian Political Thought :

Modern Indian Political Thought is to be studied in this paper with emphasis on schools of thought rather than thinkers :

1. Nationalist Political Thought in India.
2. Liberal Political Thought in India.
3. Socialist Political Thought in India.
4. Anarchist Political Thought in India.

Recommended Reading : English

1. V. P. Varma : 'Modern Indian Political Thought'.
2. Thomas Pantham and K. L. Deutsch (Eds.) : 'Political thought in Modern India'.
3. Parth Chatterjee : 'Nationalist Thought and the colonial world'.
4. S. Ghose : 'Modern Indian Political Thought'.
5. V. S. Narvane : 'Modern Indian Thought'.
6. Bhikhu Parekh : 'Gandhi's Political Philosophy'.
7. D. E. Smith : 'Nehru and Democracy'.
8. D. H. Bishop : 'Thinkers of the Indian Renaissance'.
9. B. Prasad : 'Gandhi, Nehru and Jaya Prakash'.

હિન્દી

૧. સ. વિદ્યાલંકાર : 'આધુનિક ભારતીય રાજનૈતિક ચિંતન'.

ગુજરાતી

૧. ધર્મેન્દ્રસિંહ ડી. ઝાલા : 'આધુનિક ભારતીય ચિંતકો'.
૨. હસમુખભાઈ પંડ્યા : 'લોકમાન્ય તિલક'.
૩. હસમુખભાઈ પંડ્યા : 'રામમનોહર લોહિયા' (હસમુખ પંડ્યાની આ વિષય પરની શ્રેણી).

Paper XV—Human Rights in International Relations :

1. Philosophical and Legal Foundations and Historical Developments of the Notion of Human Rights.
2. The Internationalization of Human Rights : The Evolving Inter-Governmental Institutional Structure.
3. The Issue of Implementation : Institutional (Inter-Governmental) and Non-Governmental) Activities, national, Regional, Global, and the contemporary Historical Record of Performance.
4. Diverse conceptions and the Evolving Nation of Human Rights in the contemporary world.
5. Problems and Prospects. The structure of International society, Inter cultural Accords and Human Rights.

Recommended Reading

1. R. A. Falk : 'Human Rights and State Soverrignty'.
2. R. A. Falk : 'A study of Future Worlds'.
3. C. R. Beitz : 'Political Theory and International Relations'.
4. L. R. Beres : 'People, states and World Order'.
5. P. G. Brown and H. Shue, (Eds.) : 'Boundaries : National Autonomy and its Limits'.
6. J. W. Burton : 'World Society'.
7. Jorge Domnique : 'Enhanang Human Rights'.
8. Johan Galtung : 'The True Worlds : A Transnational Perspective'.
9. Darid Gordon : 'Self-Determinastion and History in the Third World'.
10. H. H. Han (Ed.) : 'Challenges to Human Rights'.

પરિશિષ્ટ '૧૫'

ક્રમાંક ૨ (૧૫)

S.Y.B.Sc. ELECTRONICS

(In force from June, 1997)

Paper I

(a) General amplifier characteristics : Concept of amplification, amplifier notations, current gain Ai, voltage gain Av. Power gain Ap, Amplifier input resistance Ri, Amplifier output resistance Ro. Maximum power transfer, conversion efficiency, class of amplifier operation, harmonic distortion, three point and five point methods of calculating hormonic distortion. oscilloscope display of an amplifier's dynamic transfer curve, measurement of harmonic distortion, other types of amplifier distrotion.

Electronic Devices and circuits by Allen Mottershead Article No. 7.1 to 7.16.

(b) Decibels. other equations for decibel computation, zerodecibel reference level, use of a voltmeter as a decibel indicator, voltemeter range correction factors impedance correction factor. frequency response curves, amplifier bandwidth, use of an out put power meter, phase relationship in amplifiers. squarewave testing, hearing response loudness levels.

Electronic Devices and circuits by Allen Mottershead Article No. 8.1 to 8.12.

*(c) Review of : Basic characteristics of the transistor, The commonbase amplifier, the common emitter amplifier, thermal stability (transistor biasing). Hybrid equivalent circuits for a transistor.

Electronic Devices and circuits by Allen Mottershead Chapters : 9, 10, 11, 12, 14 (Review).

(d) Low frequency response of the transistor amplifier : Effect of an emitter by pass capacitor on low frequency response, effect of a coupling capacitor on low frequency response, cascading of CE stages, mid-frequency gains, low frequency response of cascaded stages, amplifier low frequency response of a square wave, Transformer coupled transistor amplifier, low frequency responses of a transformer coupled amplifier, step response of a transformer coupled amplifier.

Electronic Devices and circuits by Allen Mottershead Article No. 15.1 to 15.8.

*(e) High frequency response of the transistor amplifier : High frequency model for the common emitter amplifier, approximate CE high frequency model with resistive load, CE short circuit current gain, high frequency current gain with resistive load, high frequency response of cascaded CE stages, amplifier high frequency responses to a square wave, High frequency response of a transformer coupled amplifier, Transistor noise.

Electronic Devices and circuits by Allen Mottershead Article No. 16.1 to 16.8.

Not to be asked in the Examination.

(f) Negative feedback in transistor amplifiers : General theory of feedback, reasons for negative feebback, loop gain, Types of negative feedback in transistor circuits with complete analysis. the Darlington connections, biasing the darlington amplifier with complete analysis.

Electronic Devices and circuits by Allen Mottershead Article No. 17.1 to 17.6.

(g) Field effect transistor Amplifier : Advantages and disadvantages of the FET, Basic construction of the JFET, characteristic curves of the JFET, Principle of operation of the JFET, Effect of Vds on channel conductivity, channel ohmic region and pinch off region, characteristic parameters of the FET, Effect of temerature of FET parameters, common source AC amplifier with complete analysis, Fixed bias with self-bias, the common drain or source follower with complete analysis, frequency response of FET amplifier with complete analysis, other amplifier configurations.

Electronic Devices and circuits by Allen Mottershead Article No. 21.1 to 21.14.

(h) Mosfet : The Depletion Mosfet, The enhance Mosfet, difference between JFETS and MOSFETS, handling precausions for MOSFETS, Dual gate MOSFETS, Integral gate protection, Testing field effect transistors, Applications of dual gate Mosfet in an AGC amplifier, other applications of FETs, The field effect diode.

Electronic Devices and circuits by Allen Mottershead Article No. 22.1 to 22.10.

(i) Transistor Oscillators : Effect of positive feed back, requirement for oscillations, the phase shift oscillator with complete analysis, Wein bridge oscillator with complete analysis, resonant cirucuit oscillators with complete analysis, Maximum frequency of oscillation of a transistor, Decoupling filters. Electronic Devices and circuits by Allen Mottershead Article No. 18.1 to 18.4, 18.5 to 18.10.

(j) Regulated Power Supplies : Introduction, stabilization, Limitation of the basic zener diode shunt regulator, extending power and current range of the baic zener diode, transistor shunt regulator, emitter follower regulator, series pass regulator, The feedback regulator, series voltage regulator, simplified analysis Practical considerations. Constant current regulator.

1. A Monograph on electronic design principles by N. C. Goyal and R. K. Khetan, Khanna Publishers, New Delhi. Article No. 3.1, 3.2 3.4 3.5 to 3.10.
2. Integral Electronics by Millman and Halkias.

Paper II

(a) Electronic components : Registance, characteristics of resistors, colour code of resistors, selection factors, capacitance, characteristics of different capacitors and their selection factors. characteristics of variable capacitor, Precision variable capacitors, general purpose variable capacitor Electronic transformer, characteristics of electronic power transformer, Audio transformers equaivalent ckt of audio transformers.

Monograph on Electronic Design Principles by N. C. Goyal and R. K. Khetan.

Article No. 1.2 to 1.9, 1.11 to 1.14, & 1.17, 1.18.

(b) Network Transformations : Network definitions, Mesh and node circuit analysis, Principle of duality, reduction of a complicated network, conversions between T and n sections, the bridge-T-network, The lattice network, the reciprocity theorem, the compensation theorem, driving point impedance; transfer impedance, the parallel T-network.

Networks, Lines and Fields by J. D. Ryder.

Article No. 1.1 to 1.7, 1.9, 1.12, 1.14, 1.17.

(c) Resonance : Definition of Q, the figure of merit, series resonance, bandwidth of the series resonant circuit, Parallel resonance or antiresonance, dondition for maximum impedance, current in antiresonant circuits, Impedance variation with frequency; Universal resonance curves, Bandwidth of antiresonant circuits, the general case resistance present in both branches, Antiresonance at all frequencies; variable phase angle circuit, reactance curves.

Networks, Lines and Fields by J. D. Ryder.

Article No. 2.1 to 2.11.

(d) Impedance Transformation and coupled circuits : Transformation of impedance with tapped resonant circuits, Reactance L sections for impedance transformation; Image impedance: reactance matching, Reactance T networks for impedance transformation, coupled circuits, mutual inductance, coefficient of coupling equivalent T-network for magnetically coupled circuit, Iron-core transformer, the Ideal transformer, single guned air-core transformer, doubly tuned air core transformer, effects of over coupling, selectivity curves design of over coupled circuits.

Networks, Lines and Fields by J. D. Ryder.

Article No. 3.1, to 3.14.

(e) Filters : The neper; the decibel, characteristics impedance of symmetrical network. current and voltage ratio as exponentials; the propagation constant, properties of symmetrical networks, Filter fundamentals, pass and stop bands, Behaviour of the characteristic impedance, the contact K low-pass filter, Band pass filter, Band elemination filters, Crystal filters.

Networks, Lines and fields by J. D. Ryder.

Article No. 4.1 to 4.3, 4.5 to 4.9, 4.14, 4.15, 4.18.

(f) Wein bridge, wagner ground connection. Modern Electronic Instrumentation and Measurement technique by A. D. Helfrick & W. D. Cooper.

Article No. 5.10, 5.11.

(g) The Laplace transformations : Introduction, The laplace transformation, some basic theorems for laplace transformation Examples of the solution of problems with the laplace transformation Table of transforms Partial fraction expansion, heavisides Expansion theorem, Examples of solution by the Laplace transformations.

Network Analysis by M. E. Van Valkenburg.

Article No. 7.1 to 7.7.

(h) NOISE : Introduction, thermal noise, shot noise, partition noise, Low frequency or flicker noise, High frequency, or transit time noise, generation recombination noise. Equivalent noise resistance, signal-to-noise ratio, Noise factor, Noise temperature.

Electronic Communications (Third Edition) by Roddy and Coolen.

Article No. 4.1 to 4.11.

(i) Suspension galvanometer, Torque and Deflection galvanometer, Permanent magnet moving coil mechanism, DC ammeters, DC voltmeters, Voltmeter sensitivity, Series type Ohmmeter, Shunt type Ohmmeter, Multimeter or VOM, Calibration of DC instruments, AC current indicating instruments (Rectifier type Instruments, Typical multimeter circuits).

Modern Electronic Instrumentation and Measurement technique by A. D. helfrick & W. D. Cooper

Article No. 4.1 to 4.10, 4.11.2, 4.11.3

Paper III

(a) Logic Circuits (Review) : Binary number system, Inverters, OR Gate, And Gates, Boolean Algebra, NOR Gates NAND Gates (Not to be asked in the examination)

Digital principles and Applications by Malvino and Leach (Fourth edition) Article No. 1.1 to 1.7.

(b) Circuit Analysis and Design : Boolean laws and theorem, sum of product method, truth table to K-map, pairs quaids and oclets, karnaugh simplifications, Don't care conditions product of sums method, product of sums simplification.

Digital principles and Applications by Malvino and Leach (Fourth edition) Article No. 2.1 to 2.8

(c) Data Processing Circuits : Multiplexers, Demultiplexers, 1 of 16 Decoder, BCD to Decimal Decoders, sevel segment decoders, Encoders, Exclusive-OR gates, Parity generators checkers, Read only memory, Programmable Array Logic.

Digital principles and Applications by Malvino and Leach (Fourth edition) Article No. 3.1 to 3.10

(d) Number systems and codes : Hexadecimal numbers, The ASC II code, The Excess-3 code, The Gray code

Digital principles and Applications by Malvino and Leach (Fourth edition) Article No. 4.5 to 4.8.

(e) Arithmetic circuits : Binary addition, binary substraction, unsigned binary numbers, sign magnitude numbers, 2's complement representations, 2's complement arithmetic, Arithmetic building blocks, the Adder-substracter, binary multiplication and division.

Digital principles and Applications by Malvino and Leach (Fourth edition) Article No. 5.1 to 5.9

(f) TTL circuits Digital IC's 7400 Devices, TTL Parameters, TTL overview, AND-OR-INVERT gates, Open collector gates, Three state TTL Devices, External drive for TTL loads, TTL driving external loads, positive and negative logic.

Digital principles and Applications by Malvino and Leach (Fourth edition) Article No. 6.1 to 6.10

(g) FLIP-FLOPS : RS Flip Flop, clocked RS Flip Flop, D Flip Flop, Edge-triggered D Flip Flop, Flip Flop switching time JK Flip Flop, JK Master slave Flip Flop, Schmitt trigger.

Digital principles and Applications by Malvino and Leach (Fourth edition) Article No. 8.1 to 8.8

(h) Pulse and wave shaping circuits : Linear waveshaping circuits : (High pass Rc circuits : Response to sinusoidal input, Response to step input, Response to pulse input, response to squarewave input, Response to Exponential Input, Response to Ramp input, High pass circuit as Differentiatia. Low pass RC circuits : Response to sinusoidal input, Reasonse to square input, Response to Exponential input, Response to ramp input, Low passcircuits as an Integrator, RLC Circuits.) Non-linear waveshaping circuits (Transistor switching circuits). Astable multivibrators, Bistable multivibrators, Mono stable multivibratirs, Schmitt trigger circuits.

Electronic Devices Applications and Integrated circuits by Mathur, Kulshreshtha & Chadha Article No. 17.1 to 17.6.

Programming in Fortran IV

(i) Prelude to Digital computer

Programming in Fortran IV by K. D. Sharma (East-West Press) Article No. 1.1 to 1.3.

(j) Principle of programming.

Programming in Fortran IV by K. D. Sharma (East-West Press) Article No. 2.1 to 2.3.

(k) Language Fundamentals and construction of simple fourteen programme.

Programming in Fortran IV by K. D. Sharma (East-West Press) Article No. 3.1 to 3.12.

(l) Logical operation and transfer statements

Programming in Fortran IV by K. D. Sharma (East-West Press) Article No. 4.1 to 4.11 by Raja Raman Printice Hall of India, New Delhi.

S.Y.B.Sc Practicals

Group I

1. C. B. Transistor's static characteristics.
2. FET characteristics
3. Single stage transistor CE amplifier (Load-gain variation).
4. Frequency response of a single stage CE, BC coupled transistor amplifier.
5. Common collector amplifier (input, output, gain and phase).
6. Study of feedback, Series current feedback circuit common emitter amplifier without emitter by pass capacitor.
7. CE amplifier with negative voltage feedback
8. Common source FET voltage amplifier.
9. Frequency response of single stage transformer coupled voltage amplifier
10. Common base amplifier (input/output impedance, voltage gain frequency response and phase).
11. Study of darlington pair.
12. Dielectric constant of a material (measurement of C using LCR bridge).

Group II

1. To study different types of wave-shaping circuits.
2. To study passive differntiator and integrator circuit using R and C.
3. To study low-pass and high-pass filters using RC network.
4. To study Wein Bridge as frequency elective network.
5. RC phase shift oscillator using transistor.
6. Astable multivibrator using transistor
7. Schmitt trigger using transistors
8. Phase measurement using, CRO (Lissajour figure)
9. Study of series resonant and parallel resonant circuit by varying frequency.
10. Transistor series regular.
11. Transistor shunt regulator
12. Electronically regulated power supply with error amplifier
13. Transistor constant current regulator.

Group III

1. To study truth table of (a) X-OR gate (IC) (b) X-OR gate as controlled inverter (c) X-OR gate as parity checker
2. Verification of boolean theorems.
3. Arithmetic circuits using NAND gates, Half Adder, Half subtractor, Full Adder and Full subtractor.
4. Nibble multiplexer using gates.
5. Study of multiplexer and Demultiplexer.
6. Study of Decoders (a) BCD Decimal Decoders (7475) (b) Seven-segment Decorders (7446, 7447, 7448).
7. Study of Diode ROM.
8. Study of code Converter : BCD Binary, Binary-BCD.
9. Study of RS Flip Flop using NAND hates and NOR gates.
10. Study of Edge triggered D. Flip Flop and J. K. Flip Flop (IC).
11. Characteristics of TTL Gate
12. Study of open collector gates and three state TTL device
13. To study how different LED can be driven by Totem pole output and open collector type TTL gate.

પરિશિષ્ટ '૧૬'

ઠરાવ ક્રમાંક ૨ (૧૬)

M.Sc.

Electronics, Structure for Third & Fourth Semesters

(In force from June, 1997)

Third Semester (650 Marks)

Subject	*Total Marks*	*External Marks*	*Internal Marks*
Paper I Thin Film Technology	100	70	30
Paper II Power & Industrial Electronics	100	70	30
Paper III Microprocessor II Electronics	100	70	30
Paper IV Communications II	100	70	30
Practicals	150	105	45
Project	100	70	30

Fourth Semester (650 Marks)

Subject	*Total Marks*	*External Marks*	*Internal Marks*
Paper I Integrated Circuits, Technology	100	70	30
Paper II Analytical and Biomedical Instruments	100	70	30
Paper III Fiber Optics and its Applications	100	70	30
Paper IV Digital Signal Processing	100	70	30
Project work (industries, Research Centres Institutes Universities)	100	70	30

Third Semester Paper I : Thin Film Technology

Unit 1 : Evaporation Theory, Physical Vapour Deposition methods-Direct, Flash, Electron Beam, Selective heating evaporation, Nolecular Ream pitaxy, Deposition Monitoring.

Unit 2 : Sputtering Yield and Influenced factors, dc sputtering, RF sputtering, Magentron Sputtering, Ion beam sputtering, Chemical Vapour Deposition methods. Various types of CVD Reactions. Metal Organic Chemical Vapour Deposition. Plasma Assisted MOCVD Electroplating, spray pyrolysis.

Unit 3 : Substrates, Cleaning, Mask growth of Thin Films, condensation, Nucleation, Structural consequences, Groth tages.

Unit 4 : Characterization Techniques, X-ray Diffraction, Electron Diffraction, Electron Microscopy, Low Energy Electron Diffraction, Reflection High Energy Electron Differation, Electron probe Micro Analysre, Auger Electron Spectroscopy, ESCA.

Unit 5 : Thin Film passive Devices-Resistors : Materials, Design, Trimming capacitors : Materials, Design, Hybrid Circuits using Thin Film Resistors and Cpacitors, thin Film Industers, Transparent Conducting Oxide Films and their applications.

Unit 6 : Thin Film Active Devices. Thin Film Field effect Transistors. Thin Film Diodes. Applications of Thin Films in Photoconductor Films. Thin Film Circuits, Image Sensot, Magnetic and Optical Recording. Optical Filters.

Books Recommended

1. Thin Film Technology an Applications (Unit 1, 2, 4, 5 and 6) by B. R. Chopra & L. K. Malhotra (Tata Mcgraw Hill)
2. Active and Passive Thin Films Devices (Unit 6) by J. J. Coutta (Academec Press)
3. Handbook of Thin Films Technology (Unit 1, 2, 3, 4, 5 and 6) by Leon I Maissel and Reinhard Gland (McGraw Hill Book Co.).
4. The Materials Science of Thin Films (Unit 1, 2-4 and 6) by Milton Chring (Academic Press).
5. Thin Film Phenomena by K. L. Chopra (Tata Mcgraw Hill Book).
6. Thick Film Hybrids by Malcom R. Haskard (Prentice Hall).
7. Handbook of Thick Film Hybride Microelectronics by Charles A Haper (McGraw Hill Book Co.).
8. Thin Film Processes Edited by John L. Vossen and werner kern (Academic Press).

9. Thin Film Physics by O. S. Heavens (Methuen & [illegible])
10. Physics of Thin Films (Vol. 1 to 14) (Academic Press)

Paper II : Power and Industrial Electronics

Unit 1 : Switch mode AC/DC power supply, Resonant AC/DC power supply, [illegible] AC/DC power supply, Manually controlled AC voltage regulator, Automatic AC voltage regulator, Automatic voltage regulator [illegible] system, DC servo controlled continuous regulator, AC servo [illegible] regulator, Ferro resonant AC stabilizer [illegible] AC voltage regulator (without analysis).

Unit 2 : Polyphase rectifier, three phase half wave Delta-Wye Rectifier, Six phase star half wave rectifier, three phase Delta-Wye bridge rectifier, voltage and current relationship in polyphase rectifier, general m-phase rectifier circuit transformer utility factor, rectifier performance.

Unit 3 : Thyristor turn-ON/OFF di/dt protection, Thyristor types, series and parallel operation of thyristor, Thyristor bridge circuits, PUT, SPICE model, Natural and forced communication circuits.

Unit 4 : SCR in simple [illegible] (with analysis) one [illegible] and ramp, SCR phase control [illegible] Resonance circuit, SCR with [illegible] voltage change [illegible] battery charger, [illegible]

Unit 5 : Principle of induction [illegible] Merits of induction [illegible] dielectric heating, Applications [illegible] digital weld control [illegible] welding systems, Spot welder [illegible]

Unit 6 : Resistance [illegible] photo relay, Solid state relays, [illegible] LCD [illegible] Solar [illegible]

[illegible]

1. Electronic [illegible]
2. Electronic [illegible]
3. Communication Electronics [illegible] (Tata McGraw Hill Publishing Co. Ltd.)
4. Electromagnetic waves and Radiating Systems [illegible] and Keith G. Balmain (Prentice Hall of India)
5. Electronic communications [illegible] (Prentice Hall International)
6. Modern Electronic Communication [illegible] (Prentice Hall International)
7. Modern [illegible] Book [illegible] Ltd.

[illegible]

Project : On project [illegible]

[illegible]

Unit 1 : [illegible] multipurpose [illegible]

Unit 2 : [illegible] DMA controller [illegible]

Unit 3 : Introduction [illegible] ADC [illegible] ADC [illegible] DAC [illegible]

Unit [illegible] : [illegible] rement of Physical quantities-Temperature measurement and control, strein measurement. Deflection (or displacement) measurement and display. Water level indicator. Measurement and display of speed of a motor. Stepper motor-permanent magnet type stepper motor, variable reluctance of stepper motor. Interfacing of stepper motor. Microprocessor based control of timing ckt of thyrisor. Measurement of electrical quantities Frequency, Phase angle, Amplitude

Unit 5 : Microcomputer Development system (MDS)-EPROM Programmer, EPROM erasor, Intel 8748, Intel 8749, Intel Emulator, ROM simulator. Single chip microcomputer-Inter 8748, Intel 8749, Intel Emulator, ROM simulator. Single chip microcomputer. UPI 452, UPI 41, 42. Co processors-8031/8051/8751, Intel 8096. I/O processors-UPI 452, UPI 41, 42. Co processors. Math Processors. Math comprocessor's 8087, 80287, 80387 DX, 89387 SX. Perihecal math comprocessor 8231A, AMD 9511, Motorola 68000-Register organisation. Mode of operation. Addressing modes, status flag, Exceptions. MCS 65000 and 6502

Unit 6 : Introduction Intel 8086 Pins Description. Operating modes. Pin description for minimum mode. Pin description for maximum mode Operation of 8086 Registers of Intel 8086. Interupts. Lock. 8086. Bus cycle. Typical configuration of 8086 system, 8086 instructions. Addressing model of Intel 8086 Intel 80186, Intel 80286, Intel 8088-80188 Intel 80386, Intel 80486, Intel Pentium Intel 1860, Risc processors, Present trends

Books recommended

1. Microprocessor Architecture, Programming and Application by Ramesh S. Goankar (Wiley Estern Limited)
2. Microprocessors and Microcomputers by B.RAM (Dhanpatrai & Sons).
3. Microprocessor Architecture Programming, interfacing and Application by P. P. Tawade (E. [illegible] Technical Publications PUNE)

Paper IV : Electronic Communication II

Total 100 Marks (External 70, Internal 30)

Unit 1 : Digital communication [illegible] introduction [illegible] transmission, signalling rate, error probability, [illegible] filtering, pulse code modulation, quantization, quanization noise, [illegible] PCM [illegible] PCM [illegible] and [illegible] noise [illegible] PCM [illegible] slope overload, adaptive delta modulation. Digital carrier systems, Frequency shift keying. Phase shift keying. differential phase shift keying.

Unit 2 : Introduction propagation in free space. tropospheric propagation, the mode of propagation, radio horizon cont our maps. super and subrefraction, attenuation in atmosphere Ionosphere, effective and of the ionized gas, reflection and refraction of waves by ionosphere. effect of magnetic field, microwave links and specialized communication links

Unit 3 : Communication receivers, RM receivers, colour TV systems, Introduction, compatibility, colour combinations, colour reception.

Unit 4 : Satellite communication, introduction, orbits, station keeping, satellite attitude, transmission path, pathloss, noice considerations. The satellite systems, saturation flux density, effective isotropic radiated power multiple access methods, shade Time division multiplexing.

Unit 5 : Radar systems, Basic principles, fundamentals, radar performance factors, Pulse systems, Basic pulse Radar system, Antennas and scaning, Display methods, pulse radar systems. Moving target indicator (MTI), Radat beacons, CW Doppler Radar, RM, CW radar

Unit 6 : Introduction of Advanced communication systems — EPABX, TELEX, FACSIMILE (FAX), Cellular Telephone and Telementry, Local Area Networks (LAN) and Integrated services (ISDN). Computer communication Network.

Fourth Semester

Paper I : Integrated Circuits Technology

Unit 1 : Classification of IC's. Electronic grade Silicon, Czoschralski and Flot zone cyrstal Growing Methods. Oxygen and carbon in silicon, segregation coefficients, silicon shapping and wafer preparation, Vapour Phase Epitaxy.

Unit 2 : Oxidation-Thermal, Dry and Wet, High pressure and plasma oxidation, Lithography-Optical Lithography, Photomask, Photo resist and process, Electron Lithography, Ion beam Lithography.

Unit 3 : Etching-wet chemical Etching, Reactive Plasma etching, Impurity Doping-Diffusion, Ion implantation, Metalization-Desired properties, Applications, Ohmic contacts, choices and problems.

Unit 4 : Integrated Elements, Isolation of circuit elements, Bipolar Technology - NPN transistors, PNP transistors, Integrated diodes, semi-conductor resistors, capacitors and Inductors, MOS Technology.

Unit 5 : Design of Typical ICs, Backside of preparation, wafer sort, Devices separation, Die-Bondings, Wire bonding, Package Types and considerations, Testing of IC's

Unit 6 : Fabrication Facilities and Environment-pure water system, clean room and personnel characteristics of VLSI, Problem of raising the scale of integration-causes of IC failures- Electrostatic Discharge Damage and Alpha particle Induced soft errors, Yield and Relability, Methods of reliability evaluation, Non-silicon Technology (GaAs ICs) Future trends.

Books recommended

1. VLSI Technology (Unit 1 to 6) by S. M. Sze (McGraw Hill International Edition)
2. Semiconductor, Integrated, Integrated Circuit Processing technology (Unit 1 to 6) by W. R Wesley and K. E. Bean (Addison-Wesley Publishing Co).
3. Modern Semiconductor Fabrication Technology by Peter Gise and Rechard Blanchard (Reston Book-prentice Hall) (Unit 1 to 6).
4. Fundamentals of Microelectronics (Unit 1, 4, 6) by I. P. Stepanenko (MIR Publishers)
5. Electronic Materials Science : For Integrated circuit in Si and GAAS (Unit 2, 3, 5) by James W. Mayer and S. S. Law (McMillan Publishing Co., New Delhi)
6. Microlithography : Process technology for IC Fabrication (Unit 1, 2, and 3) David J. Elliot (McGraw Hill Book Co.)
7. Fundamentals of microelectronics processing by Hong H. Lee (McGraw Hill publishing Co.).
8. Semiconductor Devices : Physics and Technology by S. M. Sze (John Wiley and Sons)
9. Basic VLSI Design : Systems and circuits by Douglas A. Packness and Kamran Eshraghian (Prentice Hall of India, New Delhi)

Paper II : Analytical and Biomedical Instruments

Unit 1 : Introduction to PH-principal of PH measurement, Electrode for PH measurement (Glass, hydrogen and reference electrode), UV and visible spectrophotometers, single beam and double beam spectrophotometers.

Unit 2 : Infrared radiation sources, Types of monochromators, Types of detectors, Infrared single beam and double beam spectrophotometers.

Unit 3 : Special purpose ocilloscopes. Multiple Beam oscilloscopes, Multiple trace oscilloscope, sampling oscilloscope, Impulse waveform oscilloscopes, scanning oscilloscope, storage oscilloscope, power scope, Spectrum analyser, stroboscope, electron microscope, Synchronome Hygrometer.

Unit 4 : Strain gauge theory of stain gauge, types of strain gauges, resistance wir strain gauges, and measurement of strain, Measurement of pressure and vaccum Digital methods for measurement of angular velocity. Measurement of Liquid leves. Flow measurement using Hot wire and thermistor, thickness measurement. Mesurment of thermal conductivity (Gas Analyser)

Unit 5 : Electrodes-Skin surface electrodes, Needle electrodes, Micro-electrodes Electro cardiography (ECG), Cardiac Muscle physiology Electro cardiogram ECG lead and wave configuration. Introduction and classification of Blood pressure measurements Splygomanometry method.

Unit 6 : Ultrasonic transducer types, Magnetostrictive and piezoelectric Introduction of Ultrasonic measuring system, Ultrasonographic, techniques, Multielement Tranducer systems, sector, scan system, Ultrasonic in cordivascular Diseases, Bran disorders

Books recommended

1. Handbook of analytical instruments by R. S. Khandpur (TMH).
2. Handbook of biomedical instrumentation by R. S. Khandpur (TMH)
3. Biolectronic measurements by Dean & Denuan, David Michaels (PH)

4. [illegible] and Electronic Measurements and Instrumentation by A. K. Sawhney (Dhanpatrai & Sons).
5. Electronic Instrumentation by Sohn A. Allocca and Allen Stuart (PH).
6. Electron microscope and Analysis by P. J. Goodhew and F. J. Humphregs (Taylor & Francis Co. London)
7. Instrument Technology Vol. 2 by B. E. Noltigk (English language book society).
8. Advanced medical instramentation and equipment by S. E. Sutplin (Prentice-Hall, Inc.).

Paper III : Fibre Optics & Its Applications

Total 100 Marks (External 70, Internal 30)

Unit 1 : Comparison of Optical Fiber Cables with Conventional Metallic cables, and Advantages. Optical Fibers-Step-index, Single and Multimode, Graded-index, Other types of Fibers, Light propagation-Total Internal Reflection, Acceptance Angle and Numerical Aperture, Fiber Losses and Dispersion.

Unit 2 : Optical Sources-Light Emitting Diodes-Spontaneous Emission-Materials for Visible and IR LEDs. LED efficiency, Surface Emitting LED, Edge Emitters, Semiconductor Diode LASER Stimulated Emission-Double Heterostructure LASER-Laster Tuning and DegradatiDervers for LED and LASER.

Unit 3 : Photo Detectors-Characteristics of Photodetector-Photoconductor, P-n Photodiode, PIN Photodiode, Schottky Barrier and Heteriunctions Photodiodes, Avalanche Photodiode, Phototransistor Optocouplers, Other Detectors, UV and Infrared Detectors.

Unit 4 : Fiber and Preparation, fiber splicing, fiber connectors, connection losses, fiber couplers, fiber materials-fiber fabrication, mechanical properties of fibers, fiber cables, fiber cable installation

Unit 5 : Fiber Optic communication system - basic system components, coupling to and from [illegible] fiber, modulation, multiplexing and coding, Repeaters, Bandwith and Rise time Budgets, [illegible] Bit Error Rate and Eye pattern

Unit 6 : Applications of Fiber Optics : Long Haul Communication, Local Area Networks, [illegible] Fiber Optic Sensors, Intensity Modulated Sensor, Phase [illegible] Measurement of displacement, Force, Temperature] Medical Applications, Military Applications, Coherent Optical Communication, Integrated Optics

Books Recommended

1. Fiber Optic-Communication & other Applications (Unit) 1 to 6) by Henery Zanger and Cynthia Zanger (Maxwell Macmillan International Edition)
2. Optical Fiber Communication (Unit 1 to 5) by Gerd Keiser (McGraw Hill International Edition)
3. Fiber Optics (Unit 1 to 5) by Edward A. Lacy (Prentice Hall Inc. Englewood Cliffs, New Jersey).
4. Physics of Semiconductor Devices (Unit 2 and 3) by S. M. Sze (Wiley Eastern).
5. An Introduction to Optical Fibers (Unit 4 and 5) by Allen H. Chern (McGraw Hill International Edition)
6. Fiber Optics in Telecommunications (Unit 1 to 6) by N. Sharma (Tata McGraw Hill).
7. Optoelectronics : An Introduction (Unit 1 to 6) by J. Wilson & J. F. B. Hawker (Prentice Hall-International)
8. Fiber Optics *Optoelectronics (Unit 1 to 6) by Peter K. Chen (Prentice Hall series in Solid State Physical Electronics)
9. LASER and Optical Engineering by P. Das (Narosa Pub. House).
10. Introduction to Optical Electronics by Kenneth A. Jone (Harper and Row Publishers)
11. Optical Fiber System : Technology, Design and Applications by Charles K. Kao (McGraw Hill Book Co.).
12. Fiber Optics by Robert G. Seippel (Reston Publishing Co.).
13. Optical Communication Systems by John gowar (Prentice Hall of India Private Ltd.)
14. Optoelectronics for Technology & Engineering by Robet G. Seippel (Prentice Hall Englewood Cliffs).
15. Undersea Lightwave Communications by Peter K. Runge and Patrick R. Trischitta (IEEE Press)
16. Fiber Optics Communications by Joseph C. Palais (Prentics Hall International Edition).

Paper IV : Digital Signal Processing

(Total 100 Marks (External 70, Internal 30)

Unit 1 : Introduction of Signals, Systems and Signal Processing, Classification of Signals and Systems, Advantages of Digital over Analog Signal Processing, Signal Models. Continuous Time versus Discrete Time Signals, Periodic and Aperiodic Signals, Phasor Signals and Spectra, Energy and Power Signals, System Modeling Concepts. The Superposition Integral for Fixed and Linear Systems, Impulse Response of a Fixed and Linear System, Fourier Series-Trigonometric Series, Exponential Fourier Series-Symmetry Properties of the Fourier Coefficients.

Unit 2 : Fourier Integral, Energy Spectral Density, Fourier Transforms in the Limit, Fourier Transform Theorems and Pairs, System Analysis with Fourier Transform, Laplace Transform Theorems. Network Analysis using the Laplace Transform.

Unit 3 : Discrete Time Signals and Systems, Review of Sampled Data Systems, Time Domain Representations of Discrete Time Signals, Frequency Domian Representation of Discrete Time Signals, Discrete Time Signals obtained by Sampling, Discete fourier Transform.

Unit 4 : Analysis o Discrete Time Systems, Systems Definition and Examples, Linear Systems, Time-Invariant System, FIR and IIR Systems, Systems Described by a Difference Equation, Solution of Difference Equations, Stability, Frequency reponse, Linear-Phase FIR System.

Unit 5 : Z Transform-Definition and Examples, Inverse Z-Transform. Properties of the Z-Transform, Realization of Digital Systems. Block Diagrams and Signal Flow Graphs, Matrix Representations and Computability, State Variables, Realization of an IIR and FIR systems, Definitions and Properties of Discrete fourier Transforms (DFT), Fast Fourier Transform (FFT) Algorithms, FFT Analysis Application Areas.

Unit 6 : Design of Digital Filters, Design of IIR Digital Filters-Introduction to Filters, Impulse Invariant Transformation, Bilicar Transformation. Design of Digital butterworth and Chebyshev Filters, Digital Inverse Chebyshev and Elliptic Filers Design of FIR Digital Filers-Windowing and Rectangular window Filter Designs using window Frequency Sampling Techniques, A comparison of IIR and FIR Digital filers, DSP Tools, DSP Techniques in Various Applications.

Books Recommended

1. Signals and Systems : Continuous & Discrete (Unit 1 and 2) by Rodger E. ziemer william H. Tranter and D. Ronald Fannin (Maxwell Macmillan International Edition).
2. Introdyction to Digital Singnal Processing (Unit 3 to 6) by Johnny R. Johnson (prentice Hall of India, EEE).
3. Digital Signal processing (Unit 1 to 6) by Alan V. Oppenheim and Ronaldd W. Schafer (Prentice Hall of India, EEE).
4. Introduction to Digital Signal Processing (Unit 1 to 6) by John G. Proakis and Dimitris G. Manolakis (Maxwell Macmillan International Edition).
5. Theory and Applications of Digital signal processing (Unit 1 to 6) by Lawernce R. Rabiner and Bernard Gold (Prantical Hall of India EEE).
6. Signals and systems by Alan V. Oppenheim, Alan S. Wilsky and Ian T. Young (Prentice Hall of India, EEE).
7. Discrete-Time signal processing by Alan V. o penheim and Ronald W. Schafer)Prentice Hall of India, EEE)
8. Allications of Digital signal processing Editing Allan V. Oppenheim (Prentice Hall Englewood Cliffs).
9. Designing Digital Filters by C. S. William (Prentice of Hall Englwood Cliffs).
10. Digital Signal processing : A system Design Aproach by David J. Defatt, Joseph G. Lucas and william S. Hodgkiss (Hohn wiley & Sons)
11. An Introduction to Digital signal processing (Unit 1 to 6) by John H. Karl (Academic press)
12. Optimum signal processing by sophocles J. Orfanidis (McGraw Hill International)

Project

One Major project-Submission of project work and report

પરિશિષ્ટ '૧૭'

ક્રમાંક ૨ (૧૮)

MODIFIED SCHEME FOR THE D.C.S.A. COURSE

SEMESTER - I (DCSA) Applicable From Aug 97 onwards

			TEACHING SCHEME			EXAMINATION SCHEME						
Sr No	SUBJECT NO	NAME OF THE SUBJECT	THEORY Hr	TUTO Hr	PRACTICAL Hr	SESSIONAL M	SESSIONAL Hr	THEORY M	THEORY Hr	PRACT/ ORAL	T.W. MARKS	TOTAL
1	DCSA111	FUNDAMENTALS OF PROGRAMMING	4	--	4	25	1	50	3	50	25	[illegible]
2	DCSA112	ACCOUNTING & FINANCIAL MANAGEMENT	3	1	--	25	1	50	3	-	25	[illegible]
3	DCSA113	FUNDAMENTALS OF COMPUTER ORGANISATION	4	--	2	25	1	50	3	50	25	[illegible]
4	DCSA114	BUSINESS DATA PROCESSING	4	--	2	25	1	50	3	50	25	[illegible]
5	[illegible]SA11[illegible]	BASIC MICROCOMPUTER APPLICATIONS	2	-	4	25	1	50	3	50	25	[illegible]
		TOTAL	17	1	12	125	--	250	--	200	125	[illegible]

MODIFIED SCHEME FOR the D.C.S.A. COURSE

SEMESTER - II (DCSA) Applicable From Jan 98 onwards

			TEACHING SCHEME			EXAMINATION SCHEME						
Sr No	SUBJECT NO	NAME OF THE SUBJECT	THEORY Hr	TUTO Hr	PRACTICAL Hr	SESSIONAL M	SESSIONAL Hr	THEORY M	THEORY Hr	PRACT ORAL	T.W. MARKS	TOTAL
[illegible]	[illegible]	DATA AND FILE STRUCTURES	4		2	25	1	50	3	50	25	150
2	[illegible]A122	OBJECT ORIENTED CONCEPT & PROGRAMMING	[illegible]		2	25	1	50	3	50	25	150
[illegible]	[illegible]	[illegible] MANAGEMENT SYSTEMS	4		2	25	1	50	3	50	25	150
4	DCSA124	COMPUTER ORIENTED NUMERICAL & STATISTICA METHODS	4	--	2	25	1	50	3	50	25	150
5	DCSA125	SYSTEM ANALYSIS & DESIGN	3	--	--	25	1	50	3	--	25	100
[illegible]	DCSA126	CLIENT- SERVER ARCHITECTURE & INTERFACES	4		2	25	1	50	3	50	25	150
7	DCSA127	SYSTEM DEVELOPMENT PROJECT	-		30	25	1	--	--	300	150	450
		TOTALS	21	--	40	150	--	300	--	550	300	1350

DCSA111 FUNDAMENTALS OF PROGRAMMING : (Marks 50, Hours 3)

Introductory concepts:
Introduction to computers
Computer characteristics
Modes of operation
Types of programming languages
Introduction to C
Desirable program characteristics
Data representation
Flow charts, Algorithms
Overview of C
Constants, variables & Data types
Operators & Expression
Managing Input & Output Operators

Decision Making & Branching
Decision Making & Looping
Arrays
Handling of character strings
User-Defined functions
Structures & unions
Pointers
File-Management in C
Dynamic Memory Allocation & linked list
The prepocessors

References : 1. Programming in C by Balaguruswami (Tata McGraw Hill-95)

DCSA112 ACCOUNTING AND FINANCIAL MANAGEMENT (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

* To provide an awareness of the underlying financial structures and procedure of organization so that the interaction of financial systems with information systems can be understood by the Information systems designer.

COURSE CONTENT

1. **Principles of Accounting (15%)**
Assets, current assets, fixed assets, liabilities, current liabilities, other liabilities - owners equities: trading account: Accounting records and systems, control accounts and subsidiary ledgers, limitations.

2. **Assets and working capital (10%)**
Fixed assets and depreciation: assets acquisition, disposal, replacement depreciation: intengible assets, inventory methods, sources of working capital, funds, cash flows.

3. **Interpreting Accounts and Financial Statements (10%)**
Use of ratio in interpreting trading accounts and financial statements, limitations, other methods.

4. **Standards for Control (15%)**
Variable costs fixed costs, cost volume-profit analysis break-even, marginal and full costing, contributions, standard costings, analysis of variance computer accounting and algorithms

5. **Budgeting / Forecasting (25%)**
Characteristics of budget definition, advantages, proportion, forecasting, long term/short term.

6. **Project apprasal (25%)**
Methods of capital investment decision - making discounted cash flows internal rate of return, payback rate of return, sensitive analysis cost of capital

DCSA113 FUNDAMENTALS OF COMPUTER ORGANISATION (Marks 50, Hours 3)

1 Number [illegible], Boolean algebra, Combinational and sequential [30%] circuit design
2 Arithmetic [illegible] logic unit, Memory devices [15%]
3 Buses, interfaces and Control [illegible] [15%]
4 Instruction formats. Addressing modes. Introduction to 8-bit, [10%] 16-bit, 32-bit microprocessors
5 I/O devices Keyboard, VDU, Floppy and Hard Disks, Different [15%] types of printers
6 Study of IBM [illegible] compatibles [15%]
[illegible]
[illegible] board and various [illegible] (video, FDC, HDC, Serial and Parallel [illegible] controller)

References :

(1) Digital Computer Fundamentals (Sixth Edition) By - Thomas Bartee Pub : McGraw[illegible]

(2) IBM PC and Clones By - B. Govindrajalu

(3) The 386/486 PC (Second Edition) By - Harry Fairhead Pub : BPB

DCSA114 BUSINESS DATA PROCESSING (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

* To discuss methods of gathering input data, collecting them and organizing them into fi[illegible] and data base.

* To enable students to write business application programmes such as inventory cont[illegible] accounting, production planning and simulation in COBOL.

COURSE CONTENT

1. Introduction to Business Organizations (10%) :

Production,stock control, costing,purchase control,sales order processing and accounting,wa[illegible] accounting,information systems needs - role of management services department.

2. Data capture and Validation (10%) :

Input form design, punched cards, key to disk systems, optical readers, on-line man-comput[illegible] dialogues.

3. Systems Investigations (10%) :

Project selection, feasibility analysis,fact gathering, human aspects, system design a[illegible] implementation and evaluation. Input editing / validation, audit considerations. Computer wo[illegible] load scheduling, documentation and its importance-spectification language and methods.

4. Business Files - Master Files - Transaction Files (20%) :

File processing-sorting,searching,merging,matching,summarizing, Direct Access storage a[illegible] retrieval, File organization techniques.

5. Concept of good style In Data Processing Programs Design (50%) :

Examples of good application programs in COBOL. Report generation in COBOL.

* COBOL - 85 Standard features are to be taught with an Introduction to 9.x Standard[illegible]

Laboratory : The laboratory should emphasize on file-ogranization and file processin[illegible] techniques.

DCSA115 BASIC MICROCOMPUTER APPLICATIONS (Marks 50, Hours 3)

1. Installation and use of Single User Operating Systems :

Note : Any two widely-used operating systems may be used as examples.

Hardware requirements for Microsoft DOS & Windows installation: MS-DOS, it[illegible] commands and programming; Customizing and Configuring Windows; Configuring the taskbar, the Start menu; Using the Windows interface to create, print, and store a file; using Window[illegible] Explorer, Managing Disk Resources and Utilities; Manage long and short filenames; in a mixed environment; Disk Defragmenter; ScanDisk; Running Applications; Differences between a process and a thread; security considerations; installation methods; Architecture and Memory, the memory usage of a MS-DOS-based application, a 16-bit Windows-based application, and a 32-bit Windows-based application operating in Windows

2. Fundamentals of a PC Based DBMS System :

User interface; Sources of help; Components of DBMS; Application Design Process; Developing the database strategy; Developing the database design; Determining the queries; Determining the forms and reports, Determining other application components; Designing and Creating Tables; Using the table wizards; Setting field and table properties; Indexes and their uses; Setting relationship between tables; Adding and Editing Data; Using existing data; Building

Queries. Types of queries; [illegible]signing qu[illegible]s. Usin[illegible] queries; Designing action queries; [illegible] Forms. Using form wizards and builders. Using [illegible] Customizing forms; Displaying and filtering inform[illegible]tion incorporati[illegible] and embedding (OLE); Reusing forms; Printing for[illegible] Creating Re[illegible]ng re[illegible] wizar[illegible] Printing reports; Customizing reports by creating controls, adjusting controls, and setting contr[illegible] properties. Using expressions in reports; Sorting and grouping data within a report, Automating with Macros; Creating and editing macros; Running macros. Creating macro groups Creating an AutoKeys macro; Creating and customizing menus; Creating a startup macro; security requirements; Rolling out an Application; Considerations for distributing an application

3. Fundamental of Worksheet Usage :

Worksheet fundamentals; Embedding enhancing, and modifying charted data; Formatting worksheet data; Producing list-type information; Customization of the user interface for optimal performance; Data Organization, Data Analysis; Data Manipulation; Data Access; Querying external databases from within the Worksheet; Import and export of data; Integration with other Applications.

References :

1. Mastering DOS 6.2 by Robbins (BPB-97)
2. Mastering WINDOWS-95 by Cowart (BPB-97)
3. Mastering MS Office Professional 7.0 for WINDOWS-95
4. Books on line by MICROSOFT

DCSA121 DATA AND FILE STRUCTURES (Marks 50, Hours 3)

PREREQUISITES

DCSA111 Fundamentals of Programming.

OBJECTIVES OF THE COURSE

* To introduce basic concepts of data structures.
* To introduce concepts and techniques of structuring data on bulk storage devices and data compression
* Analysis of file organization techniques.

COURSE CONTENT

1. Data structures and Algorithms (25%) :

The notion of the data structures, primitive and composite data types : stacks, queues, arrays, linked lists, trees and graphs. Algorithms for manipulating Data structures, binary trees and balancing trees. Hash coding.

2. File processing Environment (25%) :

Definition of record,file,blocking,compaction and database. Introductory overview of database management system.

3. File Organization (30%) :

Implementation and tradeoffs of sequential access, index-sequential access, [illegible] b-trees, Inverted list and Multilist

4. Searching and Sorting (20%) :

Internal searching and sorting algorithms. External sort/merge algorithms

DCSA122 OBJECT ORIENTED CONCEPTS & PROGRAMMING [illegible]

1. Object Oriented Concepts :

Object Oriented Development; The Object Modeling Technique [illegible] and Associations; Advanced Link and Association Concepts [illegible] [illegible] Constructs: Aggregation [illegible] Generalization [illegible] and [illegible]struction; Multiple Inheritance, Metadata [illegible]

2. Object Oriented Programming Style and Languages :

Object Oriented Style, Reusability, Extensibility, Robustness; Class Definitions; Creating Objects, Calling operations, Using Inheritance, Implementing Associations; Object-Oriented Language Features

3. Object Oriented Languages :

An Example : Basic Programming; Output Using cout; Preprocessor Directives; Comments; Integer Variables, Character Variables, Input with cin; Type float; Manipulators, Type Conversion; Atithmetic Operators; Library Functions; Relational Operators, Loops; Decisions; Logical Operators; Precedence; Other Control Statements; Structures; Enumerated Data Types; Simple Functions; Passing Arguments to Functions; Returning Values from Fuctions; Reference Arguments; Overloaded Functions; Inline Functions; Default Arguments; Variable and Storage Classes; A Simple Class; Objects as Physical Objects & as Data Types; Constructors; Objects as Function Arguments; returning Objects from Functions; Structures and Classes; Classes, Objects, and Memory; Static Class Data; Array Fundamentals; Arrays as Class Member Data; Arrays of Objects; Strings; Operator Overloading : Overloading Unary Operators; Overloading Binary operators; Data conversion; Inneritance : Derived Class and Base Class; Derived Class Constructors, Overriding Member Functions; Inheritance in the English Distance Class, Class Hieraclues, Public and Private Inheritance; Levels of Inheritance; Multiple Inheritance; Containership : Classes within Classes; Addresses and Pointers; Pointers and Arrays; Pointers and Functions; Pointers and Strings; Memory Management : new and delete; Pointers to Objects; Pointers to Pointers; Debugging Pointers; Virtual Function; Friend Functions; Static Functions; Assignment and Copy-Initialization; The this Pointer; Streams; String I/O; character I/O; Object I/O; I/O with Multiple Objects, File Pointers; Disk I/O with Member Functions; Error Handling; Redirection; Command-Line Arguments; Printer Output; Overloading the Extraction and Insertion Operators; Multi-File-Programs; Using the Project Feature

4. Visual Object-Oriented Languages : An Example :

(a) *Introduction* : Win32-based architecture; Anatomy of a Windows-based application; Displaying and using windows; Event-driven programming; classifications of MFC; Classes in a normal MFC application; Document/view architecture, Non-document/view architecture

(b) *Development Environment* : Developer Studio; AppWizard; Component Gallery; ... editors, Browser, Debugging, Windows messages, Messge map; Using ClassWizard to manage message handlers, Using WizardBar to handle messages; Writing output to a device, CDC class, Displaying text to the view, GDI objects, Graphics output functions, Transformations, Special Visual effects, Building menus, Adding an accelerator key to a menu; Updating the appearance of menus; Creating shortcut menus; Adding toolbars, Implementing status bars; Designing and creating dialog boxes; Initializing list and combo boxes; Working with modeless dialog boxes

References :

1. Object Oriented Programming in Turbo C ++ by Robert Lafore (Galgotia - 1994)
2. Object Oriented Modeling and Design by Rumbaugh et.al (PHI -1997)
3. Visual C ++ Book-on-Line - (MICROSOFT)
4. C++ by Balaguruswamy

DCSA123 DATA BASE MANAGEMENT SYSTEMS (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

To develop and appreciation of the data resource and the issues in managing of data. In order to achieve this purpose, the course provides technical backgroud on computer system management of data. Within the context of the technical background, the course provides instruction in defining data needs, functions on data, user oriented data languages, and management of data within organizations. Understanding of data structure and storage. Analysis of file organization techniques,sequential, indexed sequential, multi-list, and inverted files, operating system topics related to data such as dynamic storage allocation and virtual memory. Data base management functions and data-base management systems. Logical and physical data models. User oriented data languages. The management of the data as a resource.

COURSE CONTENT

1. **Data Environment (10%) :**

Definition of data,issues in managing data. Uses and need of data in the organization. Defining data needs. Trade-offs between utilization of data and control of data.

2. **Basic Technical Concepts and System Resources for Data (20%) :**

(a) Introduction : The notion of a data structure, primitive and composits data types, basic machine architecture, character codes.

(b) Data Structures : Definition, logical structure, physical implementation, applications and operations for strings, arrays, stacks, queues, linked lists, trees and graphs. Searching and sorting techniques. Data handling facilities of higher level languages.

(c) Operating system topics : Dynamic storage management, virtual memory, role of operating systems in data management.

(d) File Organization : Implementation and tradeoffs of sequential, random, indexed-sequential, B-trees, inverted lists and multi-list organization.

3. **Data base Concepts (50%) :**

(a) Database management systems: Introduction and history, CODASYL, hierarchical and relational systems. Role of databases in information systems, goals and objectives of integrated databases. Data base design philosophies. Logical and physical database design conceptual data models. Query interfaces.

(b) Logical data models: data abstraction, entity-relationship model, relational database, normalization, data dictionaries and directories.

(c) Internal data model : Implementations, CODASYL-DSDL, hierarchical models. Physical data base support, memory management, relational systems, network systems, hierarchical systems.

4. **Use and management of data bases (20%) :**

(a) Data base management system facilities in building information system application. Use of high-level, user-oriented data language facilities for query, Update and report generation.

DCSA124 COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS

(Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

* To solve linear and non linear algebraic equations, perform operations of calculus ,fit curves and solve differential equations using a computer.
* To appreciate problems due to rounding errors and of convergence.

A laboratory should be an integral part of the course in which students should write programs for realistic numerical problems. Students should become familiar with numerical and statistical programme libraries such as IMSL.

COURSE CONTENT

1. **Computer Arithmetic (10%) :**

Floating point representation of numbers, arithmetic operations with normalised floating point numbers and their consequences, error in number representation-pitfalls in computing, error propagation in evaluation.

2. **Iterative Methods (20%) :**

Bisection, false position, Secant, Newton-Raphson methods. Successive approximation method, Newton Raphson method for two variables, Discussion of convergence, Solving polynomial equations,Budan's theorem, Bairstow's method, Graeffe's root squaring method.

3. **Interpolation and Approximation (20%) :**

polynomial interpolation,Truncation error in interpolation. difference tables and calculus of differences, cubic splines, inverse interpolation. Linear regression and nonlinear regression using least square approximation, Approximation of function by Taylor series and Chebyshev polynomials.

... and Integration (15%) :

Differentiation ... formulas based on polynomial fit, pit-falls in differentiation. Trapezoidal, Simpson's and Gaussian quadrature formulas.

5. **Solution of Simultaneous Linear Equation and Ordinary Differential EQNS(20%) :**

Refinement of solution in Gauss elimination method-pivoting,ILL conditional equations. Gauss-seidal and Gauss Jacobi iterative methods. Taylor series and Euler methods error analysis, Runge-Kutta methods, predictor-corrector methods, automatic error monitoring and change of step size. Stability of solution.

6. **Statistical Methods (10%) :**

Frequency Distributions,data analysis,expectations and moments. correlation and regression.

DCSA125 SYSTEMS ANALYSIS AND DESIGN (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

- To provide the knowledge and skills necessary to develop physical design and implement operational system from the logical design.
- To develop the process of planning for change and the post implementation reviews ... Both techonological and managerial aspects of system design and implementation are considered.

Case studies should be used as appropriate. Laboratory exercise should include the use of ... assisted methods for system design. The human engineering aspects of system design ... be emphasised.

COURSE CONTENT

1. **Application Development Strategies :**

Selection from alternative strategies for application development using, for example contingency theory. Development alternatives: adoption of packages for new development (outside developer or in-house development). Development methodologies: life cycle, proto-typing etc. Influences on development strategy: master plan, organisational environment, development organisation and resources. and information system structure and resouces.

2. **Application System Development Life cycle :**

Overview of the phases of application system development life cycle and their interrelationship. Problem identification and feasibility assesment, requirements determination, logical and physical design. planning to accomodate change, program development, implementation, and post implementation evaluation. Emphasis on phased development approach in planning and completing the study project. Requirements for documenting and auditability.

3. **Problem Need Identification and Feasibility Assessment :**

Sources of problems and needs. Defining the "real" need/problem. Problem analysis: degree of uncertainty, usefulness of information system application, programmability volatility.

Preliminary application requirements determination: variable versus standardized outputs, reporting, data acquisition techniques, application life expectancy, ownership/maintenance responsibility. Preliminary specification : user-system interfaces, mode of operation, input/output, software, hardware.

Feasibility assessment. economic. technical operational and schedule feasibility; and performance to information system master plan. Justification/approval by allocation mechanism, steering committee, pricing of information services, payback, cost/benefit analysis. Suggested deliverables by students: feasibility analysis report and oral presentation plus general application objectives report.

4. **Information Requirements Determination :**

Strategies for obtaining information requirements for an application : eliciting user definition of requirements, studying and modifying information delivered by an existing system, deriving requirements through study of utilizing system, normative derivation from characteristics of utilizing system, interactive discovery of requirements through use of a prototype system.

Techniques for information requirements determination: document study, system study, observation, interviewing. Communication skills, listening, writing, presenting, Management/inter-personal skills: conflict resolution, negotiation. Requirements documentation methods, narrative, graphics layouts, requirements language. Methods for providing assurance that requirements are correct and complete. Selecting strategies and techniques. Planning the process.

Suggested deliverables by students: (1) live interviews with video tape critique, and (2) detailed requirements specifications report plus oral presentation.

5. **Requirement Analysis and Logical Specification :**

Description of system logical data flows, files, and processes by graphical and automated design techniques : top-down design and hierarchical decomposition,tests for logical completeness and consistency. Data dictinoaries: content, format, and organisation; automated versus manual implementations. Process description methods such as structured English and decision tables, Documenting an existing system. Logical design for target system: data flows; files, and processes; selection of interfaces (automated versus manual) ; the user interface. User views of data for data base design. File requirements: transport volume, response times, integrity, security, etc.

Suggested deliverables by students: general logical design report; documentation plan, walkthrough performance.

6. **Quality Assurance Review of Logical Design :**

Dimensions for review: Satisfaction of user objectives, costs and benefits, logical completeness and consistency tests, quality of user interface, participants and organisation for review progress. Walkthrough. Certification documents. User sign-off. Suggested deliverables by students: design walkthrough plan, warkthrough performance and report.

7. **Detailed Logical Design :**

Logical software design. Modularization control and data flows, process interaction, process organisation, module determination, module specifications. Logical file design, data sharing file structure and logical access methods, data representation. Logical database design: alternative models such as the Entity Relationship database design: alternative models such as the Entity Relationship model scheme levels (Conceptual, external, internal). Representation of user views, View integration: Logical access paths. Improvement of logical view: normalization, aggregation, abstraction, etc.

8. **Physical Design :**

File design: structure, access, Data base interface: alternatives, logical scheme Design. System integrity: security; privacy, auditability, error recovery, system backup. Preliminary procedures design. Design of controls. Software test design: control, extreme values, etc. Development of implementation plan: strategies, coordination. Suggested deliverables by students: physical system design report and implementation plan (programme structure: test plan, conversion plan, training plan, operations procedures chart).

DCSA126 CLIENT-SERVER ARCHITECTURE & INTERFACES (Marks 50, Hours 3)

1. **Client-Server Architecture :**

Distributed processing; Cooperative processing; Client/Server processing; Peer-to-peer processing; Client/Server architecture; Time sharing; Resource sharing; How do the client and server communicate; Differences between a database server and a file server; Database server architecture; open systems interconnect (ISO) model; Application Architecture : Information system architecture; Function (application) architecture; Data architecture; Network (technology) architecture; application partitioning models; Distributed presentation:

Remote presentation; Distributed logic; Remote data management; Distributed data manage... Developer's view of a client/server application; Application segmentation; User interface; ... validation; Data transfer; Data integrity; Transaction control; Server processing; ... Architecture : Why is enterprise data connectivity an issue ?; Data access strategies; Distri... database; Centralized database; Heterogeneous data access; Transactional data versus an... data; Data warehouse; middleware ; Common interface; Common gateway; Common pro... Technical Architecture : Selection of Platform and Development Tools; Database server sele... Types of front-end development tools; Integration of tools; Database hardware; Computer-... software engineering (CASE) tools; Selection of Client/Server Application : Objec... Selection criteria; Case study; selection of pilot project; Service Model: User Services, Busi... Services, Data Services.

2. **Client/Server Application System Development Life Cycle (SDLC) :**

A mission critical application; Functional specification; Business rules; Database de... Data distribution; Prototyping; User interface design; Front-end module design; Reus... modules; Goals of the design stage; Where is user interface (UI) design in the SDLC ?; ... usability iceberg Process for doing UI design, Requirement gathering; Multiple prototypes ...

3. **Client-Server Application Tools - I :**

Visual Basic : Objects, properties, methods, and events; Form, control, and applica... Properties and methods of a form; an Object Browser, and basic controls; Changing prope... and calling methods with code; adding code to event procedures; Control accessibility; Intera... with the user; Working with code statements; Variables and Procedures : Variables; Const... Converting data types; procedures; Debugging; Types of errors; Debugging toolbar; Break m... Debug window; Controlling Program Execution; Conditional statements; Looping statem... Working with Controls : Additional standard controls; Customs controls; Menus, Status B... and Toolbars; Creating a menu; Pop-up menus; Data Access with Data Control : Overview o... database (table, field record key); Data control overview; Viewing records; Data Form Desig... Entering and editing records; Drag and Drop Editing; Steps for adding drag and d... functionality.

4. **Client Application Tools - II : Power Builder :**

Creating Tables and Windows; Database Painter; Multiple Data Windows and Tables; Us... FoxPro As An ODBC Data Source; MS-Word As An OLE Server For Power Build... Debugging Managing and Running Applications; Help Compiler and Help System; Data Pipel...

References :

1. Books-On-Line for Microsoft Visual Basic 4.0
2. Application Development with Power Builder by Rajkumar Sedani (Galgotia - 95)
3. Guide to Client Server by Joe Salemi (BPB-94)

DCSA127 SYSTEM DEVELOPMENT PROJECT - I

PREREQUISITES

DCSA125 Systems Analysis & Design

After a student has appeared at the theory and practical examinations of the second semest... he can take up the System Development Project for 8 weeks. Thereafter the examination for t... System Development Project will be conducted.

OBJECTIVES OF THE COURSE

To provide the students with experience in analysing, designing, implementation an... evaluating information systems.

INSTRUCTIONAL NOTES

Students are assigned one or more system development projects. The projects invovle part o... all of the system development cycle. Students work in teams to acquire practical the behavio... considerations in systems development.

ALTERNATIVES :

1. **Development of a System for a Local Firm :**

Under supervision of the faculty and the systems analysis staff, students develop a small applications for a computer - based management information system for a local firm. Students might also work as members of established client company teams.

2. **Development of a System for a University/College :**

Under the supervision of the faculty and the university administrative data processing unit, students develop a system to benefit the university. Examples are: alumni record and follow - up system, bookstore ordering/accounting, classroom scheduling system.

3. **Development for a Hypothetical Application :**

Students develop an application for a hypothetical firm and prepare system development deliverables.

Regulations for the Diploma in Computer Science & Applications (DCSA) w.e.f. academic year 1997-98

R. PG. DCSA 1 :

Candidates for admission to the 1 - Year Diploma in Computer Science & Applications (DCSA) course must have passed a Bachelor's degree examination under (10+2+3) pattern either in science or commerce or management or social science or engineering (including technology) or equivalent with at least II class at the University examination of this University or any other examination recognised as equivalent thereto by this University. Under Social Science all Arts graduates except those having graduated with languages as major subjects will be considered eligible for admission.

R. PG. DCSA 2 :

The admission to the course will be given by merit obtained in the admission test conducted by this University.

R. PG. DCSA 3 :

Examination for the DCSA course will be conducted under the Semester System. For this purpose, each academic year will be divided into two semesters.

R. PG. DCSA 4 :

A candidate who has passed an equivalent examination from any other University or examining body and is seeking admission to the DCSA course shall not be admitted without producing the Eligibility Certificate from the Gujarat University.

R. PG. DCSA 5 :

No candidate will be admitted to any semester examination for DCSA unless it is certified by the designated authority which is the Head of the University Department :

(1) That he has attended the course of study to the satisfaction of the designated authority.

(2) That he has maintained a good conduct and character during the studies.

R. PG. DCSA 6 :

Candidates desirous of appearing at any semester examination of the DCSA course must forward their applications in the prescribed form to the Registrar, through the designated authority on or before the prescribed date.

R. PG. DCSA 7 :

For any semester the maximum marks for the internal and external assessments shall be shown in the teaching and examination scheme. For the purpose of internal assessment, sessional tests or any other suitable methods of assessment may be used by a department. When two tests are conducted, the maximum of the marks obtained in the two tests in each subject may be considered.

R. PG. DCSA 8 :

A candidate, who has registered for the first semester examination will be permitted to prosecute his study for the second semester.

R. PG. DCSA 9 :

No candidate will be allowed to reappear in a semester examination in which he has already passed. However, a candidate having ATKT will have the option to either reappear in all the subjects or to reappear in only the subjects in which he has failed.

If such a candidate exercises the option to reappear in all the subjects, the marks obtained by him in the theory and practical/viva examinations at the earlier examinations at the same semester will stand extinguished.

R. PG. DCSA 10 :

(i) To pass a subject in any semester a candidates must obtain a minimum of 40% of marks in each head of the subject and 45% of the aggregate of the subject. When a candidate has failed in a subject, the marks in the sessional and term work head will be carried forward provided the candidate has secured a minimum of 40% marks in the head.

For a subject having Practical/VV as one of the heads of passing, if a candidate fails in the subject and if he passes in the Practical/VV head, he will have the option to either reappear in the Practical/VV examination or to allow the marks obtained in this head to be carried forward. If such a candidate exercises the option to reappear in the Practical/VV examination, the marks obtained by him in the same head at the earlier examinations will stand extinguished.

(ii) A candidate will be eligible for award of First Class with Distinction, First Class or Second Class only if he passes in all the subjects of the First and Second semester examination at one sitting. If a candidate passes First or Second Semester examination in Parts, he will be awarded Pass Class only.

For the award of class the aggregate marks will consist of the sum of the total marks of the First and the Second Semester taken together. Using the aggregate marks calculated as per above scheme a class will be awarded as follows :

(1) 70% or more marks	- First Class with Distinction
(2) 60% or more marks	- First Class
(3) [illegible] or more marks	- Second Class

R. PG. DCSA 11 :

If a student has attended DCSA I classes before Aug., 1997 and if he wants to join DCSA II classes after this new course comes into force, he would have to satisfy the following conditions before he is admitted to DCSA Semester II Classes.

(a) He will have to attend the classes in subjects of DCSA111, DCSA112, and DCSA115.

(b) He should have registered for the examinations in the three subjects as well as for the DCSA-I (Old Course) Examination.

Such a candidate will be eligible for the DCSA if he clears all the subjects of DCSA-I (Old Course), the three subjects DCSA111, DCSA112 and DCSA115 and all the subjects of Semester : II (New Course)

Such a candidate will be eligible for award of First class with Distinction, First Class or Second class only if he passes First semester (old course) examination, the examination in the three subjects (DCSA111, DCSA112, DCSA115) and Second semester (New Course) examination at one sitting. For the purpose of award of First class with Distinction, First class or second class the aggregate marks will be considered to be the sum of the following :

(a) The total marks obtained at the First semester (Old Course) examination;

(b) The sum of the marks obtained at DCSA111, DCSA112 and DCSA115 examination;

(c) The total marks obtained at the Second semester (New Course) examination.

MODIFIED SCHEME FOR MASTER OF COMPUTER APPLICATIONS (M.C.A.) COURSE

SEMESTER - I (MCA) Applicable From Aug., 1997 onwards

Sr. NO	SUBJECT NO	NAME OF THE SUBJECT	TEACHING SCHEME THEORY Hr	TUTO Hr.	PRACTICAL Hr	EXAMINATION SCHEME SESSIONAL M	SESSIONAL Hr	THEORY M	THEORY Hr	PRAC VIVA	T.W. MARKS	TOTAL
1	MCA111	FUNDAMENTALS OF PROGRAMMING	4	-	4	25	1	50	[illegible]	[illegible]	[illegible]	[illegible]
2.	MCA112	DISCRETE MATHEMATICS FOR COMPUTER SCIENCE	3	1	-	25	1	50	3		[illegible]	100
3	MCA113	FUNDAMENTAL OF COMPUTER ORGANISATION	4	-	2	25	1	50	3	[illegible]	[illegible]	[illegible]
4	MCA114	BUSINESS DATA PROCESSING	4	-	2	25	1	50	3	[illegible]	[illegible]	[illegible]
5	MCA115	BASIC MICROCOMPUTER APPLICATIONS	2	-	4	25	1	50	[illegible]	[illegible]	[illegible]	[illegible]
		TOTAL	17	1	12	125	-	250				

MODIFIED SCHEME FOR MASTER OF COMPUTER APPLICATIONS (M.C.A.) COURSE

SEMESTER - II (MCA) Applicable From Jan., 1998 onwards

Sr. NO.	SUBJECT NO	NAME OF THE SUBJECT	TEACHING SCHEME THEORY Hr	TUTO Hr.	PRACTICAL Hr	EXAMINATION SCHEME SESSIONAL M	SESSIONAL Hr	THEORY M	THEORY Hr	PRAC VIVA	T.W. MARKS	TOTAL
1	MCA121	MATRIX ALGEBRA AND GRAPH THEORY	3	1	-	25	1	50	3		[illegible]	[illegible]
2	MCA122	DATA & FILE STRUCTURES	4	-	2	25	1	50	[illegible]	[illegible]		[illegible]
3.	MCA123	OBJECT ORIENTED CONCEPTS & PROGRAMMING	2	-	2	25	1	[illegible]		[illegible]		
4	MCA124	COMPUTER ORIENTED NUMERICAL & STATISTICAL METHODS	4	-	2	25	[illegible]	50	[illegible]	[illegible]		[illegible]
5	MCA125	ACCOUNTING & FINANCIAL MANAGEMENT	3	1	-	25	1	50	3		25	100
6	MCA126	DATABASE MANAGEMENT SYSTEMS I	4	-	2	25	1	50	3	50	25	150
		TOTALS	20	2	8	150	-	[illegible]		[illegible]	[illegible]	[illegible]

MODIFIED SCHEME FOR MASTER OF COMPUTER APPLICATIONS (M.C.A.) COURSE

SEMESTER - III (MCA) Applicable From Jan., 1998 onwards

Sr. NO.	SUBJECT NO	NAME OF THE SUBJECT	TEACHING SCHEME THEORY Hr	TUTO Hr	PRACTICAL Hr	EXAMINATION SCHEME SESSIONAL M	SESSIONAL Hr	THEORY M	THEORY Hr	PRAC VIVA	T.W. MARKS	TOTAL
1	MCA211	SYSTEM SOFTWARE	3	-	2	25	1	[illegible]				
2	MCA212	COMPUTER ORIENTED STATISTICAL METHODS	4		2	25	1	[illegible]	[illegible]			
3	MCA213	OPERATING SYSTEMS	3	-	2	25	1					
4	MCA214	[illegible] BASED MANAGEMENT SYSTEMS I	3	[illegible]		25	[illegible]	[illegible]				
[illegible]	MCA215	CLIENT-SERVER ARCHITECTURE & INTERFACES	[illegible]		2	25	1	[illegible]	[illegible]			
6	MCA216	DATABASE MANAGEMENT SYSTEMS II	2		2	25	1					
		TOTAL	19	1	[illegible]	[illegible]						

MODIFIED SCHEME FOR MASTER OF COMPUTER APPLICATIONS (M.C.A.) COURSE

SEMESTER - IV (MCA) Applicable From Jan., 1998 onwards

			TEACHING SCHEME			EXAMINATION SCHEME					
Sr NO	SUBJECT NO	NAME OF THE SUBJECT	THEORY Hr	TUTO Hr	PRACTICAL Hr	SESSIONAL M	SESSIONAL Hr	THEORY M	THEORY Hr	PRACT ORAL	T.W. MARKS
1	MCA221	COMPUTER BASED OPTIMIZATION MODELS	4	-	2	25	1	50	3	25	25
2	MCA222	COMPUTER GRAPHICS	4	-	2	25	1	50	3	50	25
3	MCA223	NETWORKING TECHNOLOGIES I	4	-	2	25	1	50	3	50	25
4	MCA224	COMPUTER BASED MANAGEMENT SYSTEMS II	3	1	0	25	1	50	3	--	25
5	MCA225	SOFTWARE ENGINEERING	3	1	-	25	1	50	3	--	25
6	MCA226	ELECTIVE I	4	-	2	25	1	50	3	50	25
		TOTALS	22	2	8	150	-	300	-	175	150

ELECTIVE I COURSES : (a) PARALLEL PROCESSING (b) GROUPWARE TECHNOLOGIES I

MODIFIED SCHEME FOR MASTER OF COMPUTER APPLICATIONS (M.C.A.) COURSE

SEMESTER - V (MCA) Applicable From Aug., 1997 onwards

			TEACHING SCHEME			EXAMINATION SCHEME					
Sr NO	SUBJECT NO	NAME OF THE SUBJECT	THEORY Hr	TUTO Hr	PRACTICAL Hr	SESSIONAL M	SESSIONAL Hr	THEORY M	THEORY Hr	PRACT ORAL	T.W. MARKS
1	MCA311	SYSTEMS ANALYSIS AND DESIGN	3	1	-	25	1	50	3	--	25
2	MCA312	NETWORKING TECHNOLOGIES II	4	-	2	25	1	50	3	50	25
3	MCA313	ELECTIVE - II	3	1		25	1	50	3	--	25
4	MCA314	ELECTIVE - III	3	1	-	25	1	50	3	--	25
5	MCA315*	PRACTICAL WORK	-		6	--	--	--	--	75	25
6	MCA316	SYSTEMS DEVELOPMENT PROJECT - I	--	-	6	--	--	--	--	125	125
		TOTAL	13	3	14	100	--	200	--	250	250

ELECTIVE : II & III

(a) ARTIFICIAL INTELLIGENCE, EXPERT SYSTEMS & NEURAL NETWORKS
(b) TRANSLATOR DESIGN
(c) MICROPROCESSOR APPLICATIONS
(d) MULTIMEDIA SYSTEMS
(e) GROUPWARE TECHNOLOGIES II
(f) PERFORMANCE EVALUATION OF COMPUTER SYSTEMS (To be offered from Aug 98 onwards only)
(g) SOFTWARE PROJECT MANAGEMENT
(h) OBJECT ORIENTED ANALYSIS & DESIGN METHODOLOGIES

* The practical work will be based on the subjects in Electives II & III

MODIFIED SCHEME FOR MASTER OF COMPUTER APPLICATIONS (M.C.A.) COURSE

SEMESTER - VI (MCA) Applicable From Jan., 1998 onwards

			TEACHING SCHEME			EXAMINATION SCHEME					
Sr NO	SUBJECT NO	NAME OF THE SUBJECT	THEORY Hr	TUTO Hr	PRACTICAL Hr	SESSIONAL M	SESSIONAL Hr	THEORY M	THEORY Hr	PRACT ORAL	T.W. MARKS
1	MCA321	SYSTEM DEVELOPMENT PROJECT - II	--	--	30	--	--	--	--	400	300
		TOTAL	--	--	30	-	-	-	--	400	300

MODIFIED SCHEME FOR MASTER OF COMPUTER APPLICATIONS (M.C.A.) COURSE

SEMESTER - III (MCA) (Applicable only for the Aug., 1997 to Dec., 1997 Semester)

			TEACHING SCHEME			EXAMINATION SCHEME						
Sr. NO	SUBJECT NO	NAME OF THE SUBJECT	THEORY Hr	TUTO Hr	PRACTICAL Hr	SESSIONAL M	SESSIONAL Hr	THEORY M	THEORY Hr	PRACT ORAL	T.W. MARKS	TOTAL
1	MCA301	SYSTEM SOFTWARE	3	--	2	25	1	50	3	25	25	125
2	MCA302	COMPUTER ORIENTED STATISTICAL METHODS	4	--	2	25	1	50	3	25	25	125
3.	MCA303	OPERATING SYSTEMS	3	--	2	25	1	50	3	50	25	125
4	MCA304	DATA MANAGEMENT	4	--	4	25	1	50	3	50	25	125
5	MCA305	CLIENT SERVER ARCHITECTURE & INTERFACES	4	--	2	25	1	50	3	50	25	125
		TOTAL	18	--	12	125	--	250	--	200	125	700

MCA301 SAME AS MCA211
MCA302 SAME AS MCA212
MCA303 SAME AS MCA213
MCA304 SAME AS MCA35 (OLD COURSE)
MCA305 SAME AS MCA215

MCA111 FUNDAMENTALS OF PROGRAMMING (Marks 50, Hours 3)

Introductory concepts :
Introduction to computers
Computer characteristics
Modes of operation
Types of programming languages
Introduction to C
Desirable program characteristics

Data representation
Flow charts, Algorithms

Overview of C
Constants, variables & Data types
Operators & Expression
Managing Input & Output Operators
Decision Making & Branching
Decision Making & Looping
Arrays
Handling of character strings
User-Defined functions
Structures & unions
Pointers
File-Management in C
Dynamic Memory Allocation & linked list
The prepocessors

Reference : 1. Programming in C by Balaguruswami (Tata McGraw.Hill-95)

MCA112 DISCRETE MATHEMATICS FOR COMPUTER SCIENCE (Marks 50, Hours 3)

1. Lattices (20%) :

Relations and ordering, partially ordered sets, Lattices as posets, properties of lattices, Lattices as algebraic systems, sublattices, direct product and homomorphism, complete lattices, bounds of lattices, distributive lattice, comlemented lattice.

2. Boolean Algebra (20%) :

Introduction,definition and important properties, subboolean algebra, direct product and homomorphism , atoms antiatoms, stone's representation theorem, Boolean expressions and their equivalence, Minterms and Maxterms, Free Boolean algebra, Values of Boolean expressions, canonical forms, Boolean functions, symmetric Boolean expressions.

3. **Applications of Boolean Algebra (20%) :**
Introduction, switching algebra, representation of boolean functions, Karnaugh minimization of boolean functions. Quine_ Mccluskey algorithm Finite state ma Introductory Sequential circuits. Equivalence of states. Equivalence and reduction of ma

4. **Predicate Calculus (10%) :**
Introduction, objectives, predicates, statement functions,variable and quantifiers,free and variables,special valid formulas involving quantifiers. Theory of inference for the predicate ca

5. **Group Theory (20%) :**
Definitions and examples of semigroups,monoids and groups, abelian group cyclic gr subgroups, permutation groups, coset decomposition of groups. Normal subgroups,Lag theorem. Applications in coding theory.

6. **Fuzzy Sets (10%)**
Some useful definitions, basic operations on fuzzy sets, Image and Inverse image , I-V sets. Fuzzy relations

MCA 113 FUNDAMENTALS OF COMPUTER ORGANISATION (Marks 50, Hours 3)

1 Number Systems, Boolean algebra, Combinational and sequential [30%] circuit de
2 Arithmetic and logic unit, Memory devices [15%]
3 Buses, interfaces and Control unit [15%]
4 Instruction formats, Addressing modes, Introduction to 8-bit, [10%] 16-bit, microprocessors
5 I/O devices : Keyboard, VDU, Floppy and Hard Disks, Different [15%] types of pr
6 Study of IBM PC Compatibles [15%]

- Different types of Buses
- Functions of Motherboard and various controlles(video, FDC, HDC, Serial and Par I/O controller)

References :

(1) Digital Computer Fundamentals (Sixth Edition) By - Thomas Bartee Pub : McGra
(2) IBM PC and Clones By - B. Govindrajalu
(3) The 386/486 PC (Second Edition) By - Harry Fairhead Pub : BPB.

MCA114 BUSINESS DATA PROCESSING (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

- To discuss methods of gathering input data, collecting them and organizing them into and data base.
- To enable students to write business application programmes such as inventory co accounting, production planning and simulation in COBOL.

COURSE CONTENT

1. **Introduction to Business Organizations (10%) :**
Production,stock control, costing,purchase control,sales order processing and accounting, accounting information systems needs - role of management services department.

2. **Data capture and Validation (10%) :**
Input form design,punched cards,key to disk systems,optical readers, on-line man-comp dialogues

3. **Systems Investigations (10%) :**
Project selection, feasibility analysis,fact gathering, human aspects, system design implementation and evaluation. Input editing /validation, audit considerations. Computer load scheduling, documentation and its importance-specification language and methods.

4. **Business Files - Master Files Transaction Files (20%) :**
File processing-sorting searching,merging,matching,summarizing,Direct Access storage retrieval. File organization techniques.

5. **Concept of good style In Data Processing Programs Design (50%) :**
Examples of good application programs in COBOL. Report generation in COBOL.

* COBOL - 85 Standard features are to be taught with an Introduction to 9x Standard

Laboratory : The laboratory should emphasize on file-ogranization and file processing techniques.

MCA115 BASIC MICROCOMPUTER APPLICATIONS (Marks 50, Hours 3)

1. **Installation and use of Single User Operating System :**

Note : Any two widely-used operating systems may be used as examples

Hardware requirements for Microsoft DOS & Windows installation: MS-DOS, its commands and programming; Customizing and Configuring Windows; Configuring the taskbar, the Start menu; Using the Windows interface to create, print, and store a file; using Windows Explorer, Managing Disk Resources and Utilities; Manage long and short filenames; in a mixed environment; Disk Defragmenter; ScanDisk; Running Applications; Differences between a process and a thread; security considerations; installation methods; Architecture and Memory; the memory usage of a MS-DOS-based application, a 16-bit Windows-based application, and a 32-bit Windows-based application operating in Windows .

2. **Fundamentals of a PC Based DBMS System :**
User interface; Sources of help; Components of DBMS; Application Design Process; Developing the database strategy; Developing the database design; Determining the queries, Determining the forms and reports; Determining other application components; Designing and Creating Tables; Using the table wizards; Setting field and table properties; Indexes and their uses; Setting relationship between tables; Adding and Editing Data; Using existing data; Building Queries; Types of queries; Designing queries; Using the query Wizards; Designing select queries, Designing action queries; Creating other types of queries; Designing and Creating Forms, Using form wizards and builders; Using expressions in forms. Creating subforms; Customizing forms; Displaying and filtering information, Incorporating graphs and object linking and embedding (OLE); Reusing forms; Printing forms; Creating Reports; Using report wizards Printing reports, Customizing reports by creating controls, adjusting controls, and setting control properties; Using expressions in reports; Sorting and grouping data within a report, Automating with Macros. Creating and editing macros; Running macros; Creating macro groups, Creating an AutoKeys macro; Creating and customizing menus, Creating a startup macro; security requirements; Rolling out an Application; Considerations for distributing an application

3. **Fundamental of Worksheet Usage :**
Worksheet fundamentals, Embedding enhancing, and modifying charted data, Formatting worksheet data, Producing list-type information; Customization of the user interface for optimal performance; Data Organization; Data Analysis; Data Manipulation, Data Access; Querying external databases from within the Worksheet; Import and export of data; Integration with other Applications

References :

1. Mastering DOS 6.2 by Robbins (BPB-97)
2. Mastering WINDOWS-95 by Cowart (BPB-97)
3. Mastering MS Office Professional 7.0 for WINDOWS-95
4. Books on line by MICROSOFT.

MCA121 MATRIX ALGEBRA AND GRAPH THEORY (Marks 50, Hours 3)

1. **Linear equations and Matrices (30%) :**
Brief review of the theory of matrices,elementary row and column operations. Rank of a matrix,Inverse of a matrix,solution of Systems of linear equations,Cramer's rule,eigen values and eigen vectors, Cayley Hamilton Theorem.

Linear transformation,Orthogonal transformation Reduction to diagonal form. Bilinear forms, Quadratic forms, Reduction of Quadratic forms to diagonal form

2. **Vector Spaces (10%) :**

Definitions and examples of vector spaces, linear combinations, linear dependence and li independence, bases, subspaces, calculus of subspaces, dimension of a subspace.

3. **Linear Inequalities and Convex Sets (10%) :**

Linear inequalities and hyper spaces. Simplexes and convex linear combinations, Co polyhedran and convex-sets separating hyperplanes.

4. **Inner Productspaces (20%) :**

Inner products, definition and examples of inner product spaces, norm, triangle inequa Schwartz's inequality,orthogonal bases and Gram-schmidt orthogonalization process, comp orthonormal set, Bessel's inequality, Orthogonal expansion and fourier rule.

5. **Graphs (30%) :**

Some definitions, Graph isomorphism, subgraphs, paths, reachability and connectedness,cyc matrix representation of graphs . Trees,some definitions, labelled trees,tree searching , undire trees, spanning trees of connected relations, minimal spanning trees.

MCA122 DATA AND FILE STRUCTURES (Marks 50, Hours 3)

PREREQUISITES

- MCA111 Fundamentals of Programming.

OBJECTIVES OF THE COURSE

- To introduce basic concepts of data structures.
- To introduce concepts and techniques of structuring data on bulk storage devices a data compression.
- Analysis of file organization techniques.

COURSE CONTENT

1. **Data structures and Algorithms (25%) :**

The notion of the data structures, primitive and composite data types : stacks, queues, arra linked lists, trees and graphs. Algorithms for manipulating Data structures, binary trees a balancing trees. Hash coding.

2. **Fileprocessing Environment (25%) :**

Definition of record,file,blocking,compaction and database. Introductory overview of datab management system.

3. **File Organization (30%) :**

Implimentation and tradeoffs of sequential access, index-sequential access, random acce b-trees, Inverted list and Multilist.

4. **Searching and Sorting (20%) :**

Internal searching and sorting algorithms, External sort/merge algorithms.

MCA123 OBJECT ORIENTED CONCEPTS & PROGRAMMING (Marks 50, Hours 3)

1. **Object Oriented Concepts :**

Object Oriented Development; The Object Modeling Technique ; Objects and Class Links and Associations; Advanced Link and Association Concepts; Generalization a Inheritance; Grouping Constructs; Aggregation; Abstract Classes: Generalization as Extensi and Restriction; Multiple Inheritance; Metadata; Candidate Keys; Constraints

2. **Object Oriented Programming Style and Languages :**

Object-Oriented Style; Reusability; Extensibility; Robustness; Class Definitions; Creati Objects; Calling operations; Using Inheritance, Implementing Associations; Object-Orien Language Features

3. **Object Oriented Languages :**

An Example : Basic Programming; Output Using cout; Preprocessor Directives; Comment Integer Variables; Character Variables; Input with cin; Type float; Manipulators; Typ

Conversion; Atithmetic Operators; Library Functions; Relational Operators; Loops; Decisions; Logical Operators; Precedence; Other Control Statements; Structures; Enumerated Data Types; Simple Functions; Passing Arguments to Functions; Returning Values from Fuctions; Reference Arguments; Overloaded Functions; Inline Functions; Default Arguments; Variable and Storage Classes; A Simple Class; Objects as Physical Objects & as Data Types; Constructors; Objects as Function Arguments; returning Objects from Functions; Structures and Classes; Classes, Objects, and Memory; Static Class Data; Array Fundamentals; Arrays as Class Member Data; Arrays of Objects; Strings; Operator Overloading : Overloading Unary Operators; Overloading Binary operators; Data conversion; Inneritance : Derived Class and Base Class; Derived Class Constructors; Overriding Member Functions; Inheritance in the English Distance Class; Class Hierachies; Public and Private Inheritance; Levels of Inheritance; Multiple Inheritance; Containership : Classes within Classes; Addresses and Pointers; Pointers and Arrays; Pointers and Functions; Pointers and Strings; Memory Management : new and delete; Pointers to Objects, Pointers to Pointers; Debugging Pointers; Virtual Function; Friend Functions; Static Functions; Assigment and Copy-Initialization; The this Pointer; Streams; String I/O; character I/O; Object I/O; I/O with Multiple Objects; File Pointers; Disk I/O with Member Functions; Error Handling; Redirection; Command-Line Arguments; Printer Output; Overloading the Extraction and Insertion Operations; Multi-File-Programs; Using the Project Feature.

4. **Visual Object-Oriented Languages :** An Example :

(a) *Introduction* : Win32-based architecture; Anatomy of a Windows-based application; Displaying and using windows; Event-driven programming; classifications of MFC; Classes in minimal MFC application; Document/view architecture; Non-document/view architecture.

(b) *Development Environment* : Developer Studio, AppWizard; Component Gallery; Resource editors; Browser, Debugging; Windows messages; Mesage map; Using ClassWizard to manage message handlers, Using WizardBar to handle messages; Writing output to a device, CDC class, Displaying text to the view, GDI objects, Graphics output functions, Transformations, Special Visual effects, Building menus, Adding an accelerator key to a menu; Updating the appearance of menus; Creating shortcut menus; Adding toolbars, Implementing status bars; Designing and creating dialog boxes; Initializing list and combo boxes; Working with modeless dialog boxes.

References :

1. Object Oriented Programming in Turbo C++ by Robert Lafore (Galgotia - 1994)
2. Object Oriented Modeling and Design by Rumbaugh et.al (PHI -1997)
3. Visual C ++ Book-on-Line - (MICROSOFT)
4. C++ by Balaguruswamy.

MCA124 COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS
(Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

- To solve linear and non linear algebraic equations, perform operations of calculus ,fit curves and solve differential equations using a computer.
- To appreciate problems due to rounding errors and of convergence.

A laboratory should be an integral part of the course in which students should write programs for realistic numerical problems. Students should become familiar with numerical and statistical programme libraries such as IMSL.

COURSE CONTENT

1. **Computer Arithmetic (10%) :**

Floating point representation of numbers,arithmetic operations with normalised floating point numbers and their consequences, error in number representation-pitfalls in computing,error propagation in evaluation.

2. **Iterative Methods (20%) :**

Bisection, false position,Secant, Newton-Raphson methods. Successive approximation method. Newton Raphson method for two variables, Discussion of convergence. Solving polynomial equations,Budan's theorem, Bairstow's method, Graeffe's root squaring method.

3. **Interpolation and Approximation (20%) :**

polynomial interpolation,Truncation error in interpolation, difference tables and calculus of differences, cubic splines, inverse interpolation. Linear regression and nonlinear regression using least square approximation. Approximation of function by Taylor series and Chebyshev polynomials.

4. **Numerical Differentiation and Integration (15%) :**

Differentiation formulas based on polynomial fit, pit-falls in differentiation. Trapezoidal, Simpson's and Gaussian Quadrature formulas.

5. **Solution of Simultaneous Linear Equation and Ordinary Differential EQNS(20%) :**

Refinement of solution in Gauss elimination method-pivoting,ILL conditional equations, Gauss-seidal and Gauss Jacobi iterative methods. Taylor series and Euler methods. error analysis, Runge-Kutta methods, predictor-corrector methods, automatic error monitoring and change of step size. Stability of solution.

6. **Statistical Methods (10%) :**

Frequency Distributions,data analysis,expectations and moments, correlation and regression

MCA125 ACCOUNTING AND FINANCIAL MANAGEMENT (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

* To provide an awareness of the underlying financial structures and procedure of organization so that the interaction of financial systems with information systems can be understood by the Information systems designer.

COURSE CONTENT

1. **Principles of Accounting (15%)**

Assets current assets, fixed assets, liabilities, current liabilities, other liabilities-owners equities; trading account. Accounting records and systems; control accounts and subsidiary ledgers; limitations

2. **Assets and working capital (10%)**

Fixed assets and depreciation: assets acquisition, disposal, replacement depreciation ... able assets inventory methods; sources of working capital, funds, cash flows.

3. **Interpreting Accounts and Financial Statements (10%)**

Use of ratio in interpreting trading accounts and financial statements, limitations; other methods.

4. **Standards for Control (15%)**

Variable costs /fixed costs; cost volume-profit analysis; break-even, marginal and full costing; contributions; standard costings; analysis of variance; computer accounting and algorithms.

5. **Budgeting / Forecasting (25%)**

Characteristics of budgets, definition, advantages, proportion, forecasting long term/short term.

6. **Project appraisal (25%)**

Methods of capital investment decision - making discounted cash flows, internal rate of return, payback, rate of return, sensitive analysis cost of capital.

MCA126 DATA BASE MANAGEMENT SYSTEM - I (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

To develop and appreciation of the data resource and the issues in managing of data. In order to achieve this purpose, the course provides technical backgroud on computer system management of data. Within the context of the technical background, the course provides instruction in defining data needs, functions on data, user oriented data languages, and management of data within organizations. Understanding of data structure and storage Analysis of file organization techniques, sequential, indexed sequential, multi-list, and inverted files, operating system topics related to data such as dynamic storage allocation and virtual memory. Data-base management functions and data-base management systems. Logical and physical data ... User oriented data languages The management of the data as a resource.

COURSE CONTENT

1. **Data Environment (10%) :**

Definition of data,issues in managing data. Uses and needs of data in the organization. Defining data needs. Trade-offs between utilization of data and control of data.

2. **Basic Technical Concepts and System Resources for Data (20%) :**

(a) Introduction : The notion of a data structure, primitive and composits data types, basic machine architecture, character codes.

(b) Data Structures : Definition, logical structure, physical implementation, applications and operations for strings, arrays, stacks, queues, linked lists, trees and graphs. Searching and sorting techniques. Data handling facilities of higher level languages.

(c) Operating system topics : Dynamic storage management, virtual memory, role of operating systems in data management.

(d) File Organization : Implementation and tradeoffs of sequential, random, indexed-sequential, B-trees, inverted lists and multi-list organization.

3. **Database Concepts (50%) :**

(a) Database management systems: Introduction and history, CODASYL, hierarchical and relational systems. Role of databases in information systems, goals and objectives of integrated databases. Data base design philosophies. Logical and physical database design conceptual data models. Query interfaces.

(b) Logical data models: data abstraction, entity-relationship model, relational database, normalization, data dictionaries and directories.

(c) Internal data model : Implementations, CODASYL-DSDL, hierarchical models. Physical data base support, memory management, relational systems, network systems, hierarchical systems.

4. **Use and management of data bases (20%) :**

(a) Data base management system facilities in building information system application. Use of high-level, user-oriented data language facilities for query, Update and report generation.

MCA211 SYSTEM SOFTWARE (Marks 50, Hours 3)

PREREQUISITES

MCA113 Fundamentals of Computers Organisation.
MCA114 Business Data Processing.

OBJECTIVES OF THE COURSE

* To study architecture of various system softwares
* To give students practical "hands-on" experience.

COURSE CONTENT

1. **Assemblers: (4 Hours) :**

Features of assembly language, Mnemonics table, Symbol table, Directives, Location counter, Methods of translation, List files

2. **Macro Processors: (4 Hours) :**

Macros in assembly language, Macro name table, Macro definition table, Macro with symbols, Nesting of macros

3. **Linker & Loader: (6 Hours) :**

Various linking technics, Various Loading technics, relocatibility, Sharcability

4. **Introduction to Compiler: (4 Hours) :**

Introduction to stages of compiler. Parsing, Syntax analysis, Lexical analysis. Code generation, code optimization, Intermediate code

5. **Debuggers (... Hours) :**

... fundamentals of debugging, Debugging technics, Debugging diagnostics tools. Case ... any debugger

6. **Software Library: (8 Hours) :**

Software module library and archieves. Library architecture. Library management Architecture and management of Dynamic Link Libraries

7. **ODBC & Device Drivers: (6 Hours) :**

Requirements of drivers, Driver architectures, Device drivers. ODBC drivers

BOOK : System Programming by Dhamdhare

MCA212 COMPUTER ORIENTED STATISTICAL METHODS (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

- To give the students a working knowledge of the concept of probability and statistics. A rather abstract presentation but practical applications should be presented as often as possible. Moreover, a great number of exercises should be given on practical examples with real data home-works.

COURSE CONTENT

1. **Probability theory (20%) :**

Random events. various definitions of probability, complementation rule, addition rule mutually exclusive events. permutations and combinations, conditional probability,multiplication rule for independent events, Baye's rule.

2. **Random variables and their Distribution (20%) :**

Discrete and continuous random variables,mathematical expectation, joint probability distribution of two random variables, covariance independence of random variables,Chebyshev inequality. binomial. hypergeometric,geometric, poisson,normal and exponential distribution.

3. **Statistical Inferance (20%) :**

Sampling distribution. point estimation and confidence interval estimation ? Testing of hypothesis about mean for small and large samples. X test. non parametric methods

4. **Statistical Methods Used In Industrial Practices (20%) :**

Analysis of variance, analysis of variance in two way classification model, introduction of experimental designs. Randomized block design, Factorial experimentation. Introduction to multivariate Analysis, multiple regression, factor analysis, discriminant analysis.

5. **Time series Analysis (20%) :**

Time series,various components of a time series, moving average method, Exponential Smoothing. Box-jenking's prediction model.

Laboratory : study the applications of statistical program libraries.

Use of one out of IMSL, STATPACK, BIOMED, NAG,SSP and similar statistical packages.

MCA213 OPERATING SYSTEM (Marks 50, Hours 3)

PREREQUISITES

MCA113 Fundamentals of Computers Organization.

MCA114 Business Data Processing.

OBJECTIVES OF THE COURSE

- To study functional units of Operating System
- To study communications with peripheral devices and interrupt handling.
- To overview the other parts of multiprogramming operating system.
- To give students practical "hands-on" experience.

COURSE CONTENT

1. **Process Management (20%) :**

Process. Concurrent processing, PCB. Process states, Scheduling. Inter Process Communication, Inter Process Synchronization, Mutual Exclusion, Semaphore, Deadlock management.

2. **I/O Management (5%) :**

Program controlled I/O, Interrupt controlled I/O, Multiple I/O Interval Timer, I/O port. USART, Interface, Driver

3. **Memeory Management (20%) :**

Contiguous allocation, Non-contiguous allocation, Segemented allocation Page allocation. Virtual Memory management, Cache Memory

4. **File management (20%) :**

Storage device management, Storage allocation/deallocation, storage structures, Directory structures, File management services, Device management services

5. **Parallel/Distrubuted Operating Systems (10%) :**

Parallel systems, Distributed systems, Remote Procedures calls

6. **Unix Operating System (15%) :**

Development of Unix, Unix shell, System calls, script programming, File management

7. **Windows NT (10%) :**

Basics of Window environment, File management, Multitasking, DLL, OLE BOOK: Operating Syatems by Milan Milenkovic Operating System Concepts by Peterson The Unix Programming Environment by Kernighan Windows-NT Reference

MCA214 COMPUTER BASED MANAGEMENT SYSTEMS-I (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

(i) To establish the role of information systems in organizations and how they relate to organizational objectives and organization structure.

(ii) To identify the basic concepts that subsequent courses will draw upon : the system point of view, the organization of a system information flows, the nature of information systems.

(iii) To provide students with knowledge of basic techniques and elementary skills in representing system structure.

(iv) To introduce various types of applications which are part of an information system.

COURSE CONTENT

1. **Information System and Organisation (25%) :**

(a) Management Information System: Role of information systems in organisations. Alternative taxonomies of information system: such as modes of processing, management levels. Structure of a management information system. Human-machine information systems.

(b) Relating Systems and Information to Organisational Objectives: Matching the information system plan to the organisational strategic plan. Identifying key organizational objective and processes and developing an information system development. Identifying organisational information needs. Approach to development of an organisational information system. User role in systems development process. Establishing a port-folio of information system applications. Importance of auditability, maintainability and recoverability in system design.

(c) Information systems and organisational structure and management. Information/data as organisational resources. Management and ownership of systems and information/data. Relationship of organisational structure and information requirements. Role of information in organisational planning. Management of change caused by information systems. Expectations management.

2. **Representation and Analysis of system structure (15%) :**

Models for representing systems; narrative, mathematical, graphical, tabular and procedural Graphical methods. hierarchical (organisation chart, tree diagram, etc.), information flow process flow decomposition and aggregation: methods and heuristics, representation assurance completeness, consistency, adequacy,Application of system representation method to case examples.

3. **Systems, Information and Decision Theory (10%) :**

(a) Systems concepts General systems theory Systems concepts : Structure, boundaries state and objectives. System classification : open, closed, deterministic, and probabilistic. Concepts of entropy and Adaptation Properties of open systems. [illegible]

Interfaces. Element independence/dependence, decoupling, and integration. System control standards, feedback loops, and costs. Systems with complex/conflicting/multiple objectives methods of resolution, suboptimization

(b) Information concepts. Information theory. Information content and redundancy. Data V.S information. Value of information. Psychological value of information. Classification and compression. Summarizing and filtering. Inferences and uncertainty absorption. Human as information processors

(c) Decision Processes. Identifying information needed to support decision making. Human factors, problem characteristics, and information system capabilities in decision making.

4. **Information System Applications (45%) :**

(a) Transaction processing applications. Basic accounting applications

(b) Systems to support operational processes. Production, marketing, finance, logistics, etc.

(c) Transactions to support management control

(d) Applications for budgeting and planning.

(e) Systems to support decision making. Defining a decision model. Developing a prototype. Application of a high-level user language. Adaptive decision, moving through progressive cycles towards an optimum system. Case examples using high-level language in solution.

(f) Other use of information technology : work place automation, word processing, electronic mail, personal computers, remote conferencing and graphics.

5. **System Evaluation and Selection (5%) :**

Identification and generation of alternatives. Evaluation and selection of alternatives. [illegible] priorities and allocating resources: cost benefit, organisational power, centralised [illegible] [illegible]-ralised allocation mechanism

MCA215 CLIENT-SERVER ARCHITECTURE & INTERFACES (Marks 50, Hours 3)

1. **Client Server Architecture :**

Distributed data processing, Cooperative processing; Client/Server processing; Peer-to-peer [illegible]; Client/Server architecture; Time sharing; Resource sharing; How do the client and server [illegible]; Differences between a database server and a file server; Database server [illegible] [illegible] Interconnect (ISO) model; Application Architecture : Information [illegible] architecture, Function (application) architecture; Data architecture; Network(technology)architecture; application partitioning models; Distributed presentation; Remote presentation, Distributed logic, Remote data management; Distributed data management; Developer's view of a client/server application, Application segmentation; User interface; Data validation. Data transfer, Data integrity; Transaction control; Server processing; Data Architecture. Why is enterprise data connectivity an issue ?; Data access strategies; Distributed database, Centralized database. Heterogeneous data access; Transactional data versus analytic data. Data warehouse. middleware . Common interface; Common gateway; Common protocol; Technical Architecture. Selection of Platform and Development Tools. Database server selection; Types of front-end development tools. Integration of tools; Database hardware; Computer-aided software engineering (CASE) tools. Selection of Client/Server Application : Objectives; Selection criteria; Case study, selection of pilot project; Service Model: User Services, Business Services, Data Services

2. **Client/Server Application System Development Life Cycle (SDLC) :**

A mission critical application. Functional specification; Business rules, Database design; Data distribution. Prototyping. User interface design; Front-end module design; Reusable modules. Goals of the design stage. Where is user interface (UI) design in the SDLC ?; The usability iceberg Process for doing UI design. Requirement gathering; Multiple prototypes

3. **Client-Server Applications Tools - I :**

Visual Basic : Objects, properties methods, and events; Form, control, and application; Properties and methods of a form; an Object Browser, and basic controls; Changing properties and calling methods with code, adding code to event procedures; Control accessibility; Interacting with the user. Working with code statements; Variables and Procedures : Variables; Constants; Converting data types; procedures. Debugging; Types of errors; Debugging toolbar; Break mode; Debug window, Controlling Program Execution; Conditional statements; Looping statement; W[illegible] with Controls : [illegible] standard controls, Customs controls; Menus; Status Bars Toolbars; Creating a menu, Pop-up menus; Data Access with Data Control : Overview of

a database (table, field record key); Data control overview, Moving records. Data Form Designer; Entering and editing records; Drag and Drop Editing; Steps for adding drag and drop functionality

4. **Client Application Tools - II : Power Builder :**

Creating Tables and Windows, Database Painter; Multiple Data Windows and Tables, Using FoxPro As An ODBC Data Source; MS-Word As An OLE Server For Power Builder. Debugging Managing and Running Applications, Help Compiler and Help System; Data Pipeline

References .

1. Books-on-Line for Microsoft Visual Basic 4.0
2. Application Development with Power Builder by Rajkumar Sedani (Galgotia-95)
3. Guide to Client Server by Joe Salemi (BPB-94)

MCA216 DATA BASE MANAGEMENT SYSTEM - II (Marks 50, Hours 3)

Application Development using RDBMS Package like Oracle 7.0, OpenIngres

Topics :

1. Data Entry Form Design
2. Triggers, Rules, Procedures, Stored Procedures, Data Base Procedures
3. Menus
4. SQL
5. 4GL of RDBMS
6. Utilities for DBA
7. Data base administration : functions, organizational implications, shared access control, security, recovery, query interfaces, performance measurements.
8. DBMS evaluation : Selection, standardization, survey of commercial DBMS, implementation tools.
9. Distributed data bases : mini and micro data bases, very large data bases
10. Introduction to Object Oriented Data Bases.

MCA221 COMPUTER BASED OPTIMIZATION MODELS (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

* To introduce and exercise a range of analytical modelling techniques useful in decision-making in the sytem design environment.
* To consider the function of such models as guides for data collection, structures for data manipulation, and as systems for testing assumptions and generating a variety of alternatives.
* To identify the problems of data collection, maintenance, and accuracy when using models to assist decision-making activities.

The course deals with mathematical programming algorithms and applications rather than theory. There are four aspects of the course

(i) study of model formulation and discussion of documented real world applications,

(ii) Study of mathematical programming algorithms

(iii) Consideration of the problems involved in implementing mathematical programming algorithms on a computer, and

(iv) Use of a computer software package to study the behaviour of [illegible] models than can be solved by hand

COURSE CONTENT

1. **Linear Programming (30%) :**

Formulating linear programming models, the graphical and simplex methods, revised simplex method, duality, transportation and assignment problems

2. **Integer programming and sequencing (10%)**
3. **Activity network analysis (15%)**
4. **Deterministic and probabilistic inventory models** [illegible]
5. [illegible] (10%)
6. [illegible]
7. [illegible] (5%)
8. **Case Studies** [illegible]%).

MCA222 COMPUTER GRAPHICS (Marks 50, Hours 3)

Geometry and Line Generation, Circle Generation . (10%)
Graphics Primitives . (10%)
Polygons : (20%)
Transformations (10%)
Segments (5%)
Windowing and Clipping : (15%)
Interaction (5%)
Three Dimension : (15%)
Curves and Surfaces:(10%)
Interpolating Polygons,B splines,Benzier Polynomials
(No algorithms, concepts only).

MCA223 NETWORKING TECHNOLOGIES I (Marks 50, Hours 3)

OBJECTIVES OF THE COURSE

- To introduce the concept of electronic data transmission, the representation of data in a transmission system and the design of communication methods in a distributed computer system.
- To discuss the possible network configurations and control strategies necessary for various applications Protocols, architectures and transmission alternatives, communication environment regulatory issues, network pricing and management.

COURSE CONTENT

1 Fundamental Concepts of Data Transmission :

The Structure and Types of Communication Systems, Communications Systems and Data Communication.

2 Communication Channel Characteristics :

The Communication Channel, Electromagnetic Waves, Frequency and Wavelength; The Electromagnetic Spectrum, Bandwidth and Channel Capacity; Bandwidth and Distance

3 Modulation, Analog Communication and Multiplexing :

Modulation and Demodulation; Fourier Analysis; Types of Modulation; Analog versus Digital Modulation; Multiplexing, Space-Division Multiplexing; Frequency-Division Multiplexing; Time-Division Multiplexing; Combined Modulation Systems; Shortcomings of Analog Communication and Multiplexing

4 Communication Media and Connections :

The Role of Medium; Wire and Cable; Air and Vaccuum : Low -Power, Single-frequency Radio, High-Power Single-frequecy Radio; Spread-spectrum Radio; Terrestrial Microwave; Satellite Microwave; Point-to-Point and Broadcast Infrared Systems; Public Telephone Network, Fiber Optics, Noise; Noise Measurements; The Effects of Bandwidth Limitation (and Related Problems); Common Mode Voltage, Transmission Media Connectors; Network Interface Card; Repeaters, Modems, Hubs, Bridges; Routers, Brouters

5 Digital Communication, Communication Systems Requirements :

Description of Digital Systems: Advantages of Digital Systems, Sampling Theory, Analog to Digital Conversion, Encoding of Digital Signals; Multiplexing and Modulation of Digital Signals, Data Communication System Issues, Codes and Formats; Protocol; Synchronous and Asynchronous Systems: Data Rates and Serial and Parallel Communications; Protocol Examples; Hardware versus Software : Protocol Conversion

6 The RS-232 Interface Standard & Other Communications Interfaces :

Introduction to RS-232; RS-232 Voltages, Data Rates & Signals; Integrated Circuits for RS-232; Multidrop Communications; Other Key EIA Standards; The Current Loop

7. Telephone Systems and Modems :

Basic Telephone Service, Dialing; Telephone Lines; Private Exchanges; The Role of Modems: Some Specific Modems and Standards.

8. Networks :

Network Topology; Basic Network Protocols and Access; Media, Modulation, and Physical Interconnection; Local Area Networks; Wide Area Networks, Packet Switching, and Gateways; Network Services: File Services, Transfer, Storage & data migration, update synchronization, archiving; Print Services; Multiple Access from Limited Interfaces, Queuing, sharing FAXes; Message Services : e-mail, voice-mail; Object-oriented applications; workgroup applications; workflow management; Linked-Object documents; Directory Services; Application Services; Specialization of Servers; Scalability; Database Services; Cellular Networks and Systems; The Integrated Services Digital Network

9. Network Protocols & Models :

Rules, Models, Layers & Layer-interaction; 7-layer OSI Model and DOD model

10. Error Detection, Correction, and Data Security :

The Nature of Errors; Parity; Cyclic Redundancy Codes; Dealing with Errors; Forward Error Correction; The Nature of Data Security Random Sequences; Spread Spectrum Systems and PRSQ Encryption; The Data Encryption Standard.

References :

1. Data Communications : William L. Schweber (McGraw Hill)
2. Networking Technologies Manual, Course 2000, (Novell Education)
3. Network Basic Study Guide by Chellis (BPB-97)
4. Networking Essential Study Guide by Chellis (BPB-97)

MCA224 COMPUTER BASED MANAGEMENT SYSTEMS - II (Marks 50, Hours 3)

Section - I (50%)

INTRODUCTORY BEHAVIOURAL SCIENCE AND ORGANIZATIONAL STRUCTURE

(1) Goals & Objectives :

Definition of objectives : social technical economic and organizational objectives (koonz) Hierarchical structure of objectives global to operational Problem oriented and goal oriented objectives (koonz). Conflicts and possibilities of conflict resolution (koonz) Determination of policy strategy planning approaches and steps of strategy planning. Forecasting, Limits of planning (stoner)

(2) Human systems :

Levels of human needs: from subsistence to job satisfaction. Importance of job satisfaction as an organizational goal. A systems view of motivation in organizations. Integrative approaches (stoner)

(3) Classical theories of organization :

Functional apporach division labour formal org. structure and lines of authority Span of control, Authority and responsibility. Examples of canent formal organizations in practice (stoner,koonz)

(4) Behavioural theories :

Reactions to the limitations of formal organization. Significance of human relations and group behaviour (stoner)

(5) Decision process :

Parts of organization system and their dependency. Development of decision procedures Allocation of decision making functions. Decision making process, Improving effectiveness of decisions (stoner, koonz)

(6) System and organization :

Description of some real systems in detail. Factors governing organizational size control stability and growth communications, Control systems, Group problem solving Task forces and committees (stoner, koonz)

(7) Types of models :

Mathematical models corporate planning models. Manpower planning models Team organization linking pin models. Colleague model.

(8) Relevance of models for systems designers :

Models as an aid to understanding inherent weakness and limitations of models. Models as tools for analysis and design. Models as tools for planning and prediction. Models as tools for monitoring and control.

Section - II (50%)

MANAGERIAL ECONOMICS

PREREQUISITES MCA125 ACCOUNTING AND FINANCIAL MANAGEMENT

OBJECTIVES OF THE COURSE

The main objective of this section is to introduce students to some of the basic concepts used in economic analysis The amount of time given to the section is small. The intention therefore is to introduce the basic concepts in such a manner that it will be possible for students to relate their reading in the subject to the specific problems faced by the systems designer

COURSE CONTENT

1 Demand Analysis and Forecasting
2 Production Analysis and Costing
3 Market Structures and Price Determination
4 The money system - the market for money. Interest rates. The capital market - banks, stock exchange. The multiplier and accelerator. Business Cycle
5 The economy - a concept of national income - aggregate demand and expenditure. Savings and investment. The trade cycle and its control International trade and the balance of payment.

MCA225 SOFTWARE ENGINEERING (Marks 50, Hours 3)

1. Fundamentals of Software Engineering

2. Computer System Engineering :

Computer Based System
Computer System Engineering
Computer Hardware Considerations
Computer Software Considerations
Human Considerations

3. Software Project Planning :

Software Metrices for Productivity and Quality
[illegible] Technique
[illegible]

4. Requirements Analysis Fundamentals

5. Software Design Fundamentals :

Design Process
Design Fundamentals
Effective Mudular Design
Data Design
Architecture Design

6. Software Quality Assurance :

7 Software Testing Techniques

8 Software Testing Strategies

9 Verification and correctness proof

10 Performance Tuning :

Code tuning techniques
Program Optimization
[illegible] Performance Evaluation

MCA226 (a) PARALLEL PROCESSING (Marks 50, Hours 3)

Introduction & Literature Review :

1.1 The problem of parallel processing
1.2 Literature Review
1.3 Hardware for parallel processing
1.4 software for parallel processing
1.5 Fast fourier transform
1.6 Matrix manipulation
1.7 Neural network analysis
1.8 Neural Network and parallel processing

Software for Parallel Processing :

2.1 Introduction
2.2 Operating system requirements
2.3 Time sharing with a single or multiple processor
2.4 Forking - Joining processes
2.5 Spin - Locks, Contention and self scheduling
2.6 Barriers and race condition
2.7 Data dependencies
2.8 Performance tuning
2.9 Using cheche effectively
2.10 Implementation of functions required for parallel processing

Parallel Processing and FFT :

3.1 Introduction
3.2 Matrix representation of DFT
3.3 Fast fourier transform (FFT)
3.4 FFT technique
3.5 Parallelized. Implementation of FFT
3.6 Two-Dimension FFTS
3.7 Row column Decomposition
3.8 Radix-2 FFT
3.9 2D-FFT (a totally new approach)

Solution of a System of Linear Algebraic Equations :

4.1 Introdution
4.2 Parallel cycle elimination scheme
4.3 The cyclic reduction algorithm
4.4 A divide & conquer method
4.5 Linear tridiagonal system
4.6 Triangular & banded linear systems
4.7 Algorithm using the determinant of a hessenberg matrix
4.8 Products and power of matrices
4.9 Design of hybrid algorithm

Network & Parallel Processing :

5.1 Introduction
5.2 Backpropagation network
5.3 An. I.C for artificial neural networks
5.4 Additional neural networks
5.5 Mapping neural nets onto a massively parallel architecture
5.6 Systolic architecture
5.7 Performance and conclusions

References :

1 Thesis of PROF. J.S.Shah
2 Advance Computer Architecture by Kai Hwang

MCA 226(b) GROUPWARE TECHNOLOGIES I (Marks 50, Hours 3)

1. Basic Concepts :

Formatting a Document; Using Your Workspace, Using Help, Using View and Folders, Using Document Tools, Mail Basics; Working with Folders, Using Mail, Replicating a Database, Searching for Information, Enhancing the Documents, Web Navigator

2. Developing Groupware Applications :

A Groupware Application; Designing a Database. Creating a Database. Designing and Creating a Form; Adding Static Text; Adding Fields, Creating Response Forms. Planning a View, Creating a View Creating a Folder Creating Formulas; @ Functions Using Formulas to Edit and Validate [illegible] Enhancing a Form; Enhancing a View Adding New Views. Automating F[illegible] and Views, Creating a Navigator, Creating Agents, Implementing Security, Creating Database Help; Creating a Database Icon, Creating an Archive Database, Creating a Database from a Template

3. **System Administration for a Groupware System :**

The Environment; Named Networks & Domains; Mail Routing; Shared Mail; Mail Troubleshooting Tools, Security and Naming : ID; the Replication Process; Setting Up Replication; Factors that Affect Replication; Scheduling Replication; Using User Setup Profiles and location Documents Enhancing Remote Access with Passthru and Remote LAN; Using the Server Console; Setting Database Limits and Quotas; Maintaining Database Integrity; Using the Administration Process; Installation & Setup : Setting up the First Server, Setting Up the Network and COM Ports; Setting up the Administrator's Workstation; Registering Servers & Workstations; Setting Up Servers and Workstations.

References

1. Application Devlopers Manual Series 4 (LOTUS)
2. System Administrators Manual.Series 4 (LOTUS)

MCA311 SYSTEMS ANALYSIS AND DESIGN (Marks 50, Hours 3)

OBECTIVES OF THE COURSE

- To provide the knowledge and skills necessary to develop physical design and implement an operational system from the logical design.
- To describe the process of planning for change and the post implementation reviews and changes. Both techonological and managerial aspects of system design and implementation are considered

Case studies should be used as appropriate. Laboratory exercise should include the use of computer - assisted methods for system design. The human engineering aspects of system design should be emphasised.

COURSE CONTENT

1. **Application development Strategies :**

Selection from alternative strategies for application development using, for example, [illegible] Development alternatives: adoption of packages for new development (outside [illegible] in-house development) Development methodologies, life cycle, proto-typing etc. [illegible] development strategy master plan, organisational environment, development [illegible] and resources, and information system [illegible]ture and resource

2. **Application System Development Life cycle :**

Overview of the phases of application system development life cycle and their interrelationship. Problem identification and feasibility assesment, requirements determination, logical and physical design, planning to accomodate change, program development, implementation, and post implementation evaluation. Emphasis on phased development approach in planning and completing the study project. Requirements for documenting and auditability.

3. **Application System Development Management :**

Project management concepts. Project control for application system development. Responsibilities of project manager, project team members, users, etc. Service level agreements covering management disciplines, management of change, problem resolution, processing, and networking. Performance management, management reporting. Impact of project management on organisational planning cycles.

5. **Problem Need Identification and Feasibility Assessment :**

Sources of problems and needs. Defining the "real" need/problem. Problem analysis: degree of uncertainty, usefulness of information system application, programmability volatility. Preliminary application requirements determination: variable versus standardized outputs, reporting, data acquisition techniques, application life expectancy, ownership/maintenance responsibility. Preliminary specification : user-system interfaces, mode of operation, input/output, software, hardware.

Feasibility assessment: economic, technical operational and schedule feasibility; and performance to information system master plan. Justification/approval by allocation mechanism: steering committee, pricing of information services, payback, cost/benefit analysis.

Suggested deliverables by students feasibility analysis report and oral presentation plus [illegible]eral application objective report.

6. **Information Requirements Determination :**

Strategies for obtaining information requirements for an application : eliciting user definition of requirements, studying and modifying information delivered by an existing system, deriving requirements through study of utilizing system, normative derivation from characteristics of utilizing system, interactive discovery of requirements through use of a prototype system.

Techniques for information requirements determination: document study, system study, observation, interviewing. Communication skills, listening, writing, presenting. Management/inter-personal skills: conflict resolution, negotiation. Requirements documentation methods, narrative, graphics layouts, requirements language. Methods for providing assurance that requirements are correct and complete. Selecting strategies and techniques. Planning the process.

Suggested deliverables by students: (1) live interviews with video tape critique, and (2) detailed requirements specifications report plus oral presentation.

7. **Requirement Analysis and Logical Specification :**

Description of system logical data flows, files, and processes by graphical and automated design techniques : top-down design and hierarchical decomposition,tests for logical completeness and consistency. Data dictinoaries: content, format, and organisation; automated versus manual implementations. Process description methods such as structured English and decision tables. Documenting an existing system. Logical design for target system: data flows: files, and processes; selection of interfaces (automated versus manual) ; the user interface. User views of data for data base design. File requirements: transport volume, response times, integrity, security, etc

Suggested deliverables by students: general logical design report, documentation plan, walkthrough performance.

8. **Quality Assurance Review of Logical Design :**

Dimensions for review: Satisfaction of user objectives, costs and benefits, logical completeness and consistency tests, quality of user interface, participants and organisation for review progress. Walkthrough. Certification documents. User sign-off. Suggested deliverables by students. design walkthrough plan, warkthrough performance and report

9. **Application Software Make or Buy Decision :**

Criteria for software selection. Evaluation process.

10. **Planning to Accommodate Change :**

Organisational and individual need for system stability, need for system changes. System design to accommodate change. Monitoring for change: change management: request and approval, assesing impact, determining effect on existing systems, grouping and scheduling changes, Making changes: testing, acceptance, updating procedures and documentation. Suggested deliverable by student: a system change procedure.

11. **Detailed Logical Design :**

Logical software design. Modularization control and data flows, process interaction, process organisation, module determination, module specifications. Logical file design, data sharing file structure and logical access methods, data representation. Logical database design, alternative models such as the Entity Relationship database design, alternative models such as the Entity Relationship model scheme levels (Conceptual, external, internal). Representation of user views. View integration. Logical access paths. Improvement of logical view: normalization, aggregation, abstraction, etc

12. **Physical Design :**

File design: structure, access. Data base interface: alternatives, logical scheme Design System integrity, security; privacy auditability, error recovery, system backup. Preliminary procedures design. Design of controls. Software test design. control, extreme values, etc. Development of implementation plan. strategies, coordination. Suggested deliverables by students Development of implementation plan (programme structure test plan, physical system design report and implementation plan (programme structure test plan, conversion plan, training plan, operations procedures chart).

13. **Hardware and System Software Selection :**

Hardware configuration mainframe and memory, front-end processors peripherals etc. [illegible] systems software Benchmarks, [illegible] emulation, vender selection scoring techniques. RFP [illegible] processors, editors, [illegible] communication [illegible] operation [illegible] performance and acceptance criteria. Suggested deliverable [illegible] Network [illegible] of each type.

by [illegible] scoring sheet [illegible] of each type.

14. **Program Development and Testing :**

Language selection, functional decomposition, structured programming, organisation of programming task. Software objectives and performance crite.ia. Determination of acceptance criteria. Software test design strategies top-down, bottom-up and variants. Unit and integration testing. Development of a testing plan. Design of test cases and schedulers. Test libraries. Suggested student deliverables: coding organisation plan, design of test cases for modules and system integration, test schedule.

MCA312 NETWORKING TECHNOLOGIES II (Marks 50, Hours 3)

1. **Internet Concepts and TCP/IP :**

Overview of the Internet; Routers using TCP/IP; Host-to-host communications ; How the Internet works; URLs; Internet Services; How Microsoft services fit into the Internet; other Internet services . e-mail, Internet; RLogin; rpc; FTP Services; FTP architecture connection oriented and connection-less protocols; Performance Monitoring, Gopher Service: World Wide Web (WWW) Service

DNS Overview; History, function, How DNS fits Internet architecture; Overview of security architecture

DOD Model, TCP/IP; TCP/IP utilities on Windows NT; Architectural model; Configuration parameters; Installation; Testing a configuration and an IP connection

2. **IP Addressing and Routing :**

Address classes; Guideline for network addressing and host addressing; Subnet Addressing; subnet mask; Defining a range of network IDs; Static versus dynamic IP routing; IP routing on Windows NT; Building a routing table; IP address Resolution : Resolving a local IP address; Resolving a remote IP address; ARP cache

NetBIOS Name Resolution & WINDOWS Internet Name Service LMHOSTS file; Planning for WINS replication

Host Name Resolution TCP/IP naming schemes; a host name; HOSTS file; Configuring Windows NT for a domain name service (DNS) or a HOSTS file

3. **Dynamic Host Configuration Protocol :**

Lease mechanism; Planning a DHCP environment; Installing DHCP; Configuring a DHCP scope

4. **Connectivity in Hetrogeneous Environments :**

Commands of Windows NT versus TCP/IP utilities, Interoperating with an RFC-compliant NetBIOS host; Using a LAN Manager for UNIX host as a network file system (NFS) gateway; Installing and configuring the file transfer protocol (FTP) server; Installing the TCP/IP print server

5. **Implementing SNMP Service :**

Management systems and agents; Management information base (MIB)

6. **Performance Tuning and Optimization Factors that affect performance :**

Goals of performance tuning, sliding windows; Tuning for performance; Tunning for memory, optimizing TCP/IP; Isolating NetBIOS traffic

7. **Browser and World Wide Web :**

Explorer Internet Server manager; Property sheets; WWW, Gopher; FTP; Monitoring server performance Connecting to a service provider; HTML; Publishing a WWW page; User interface considerations; Default home page; Registration of a page with directory services; Tools to create a WWW page.

8. **Security Features :**

Security features of Internet information Server, Private and public key; Personal Communication Technology overview; Extensions

9. **Other Issues in Internet :**

Common Gateway Interface (CGI)-- Backward compatibility with Practical Extraction and Report Language (PERL) script; Internet Server Application Programming Interface (ISAPI); Filters between TCP and Internet Information Server. Open Database Connectivity (ODBC) implemented as an ISAPI application; Wide Area Information Search : WAIS tools; Local and nonlocal tools that allow indexing and searching of data; Internet Service Manager (report, server and services view); Property Sheets (service Manager; Configuration of services (WWW, Gopher, FTP), Virtual Directories and Servers; Local Virtual directories; UNC virtual directories; Virtual Servers Planning Internet services Hardware and Software requirements; Estimating bandwidth— performance issues, Internet versus Intranet; Connecting with Internet service providers; Performance monitoring, Event Viewer, Logging Registry changes made by the Administration

10. **Java Programing :**

An Applet; The Java Workshop; Java Classes; a Java Object; a Java Class, Putting Classes and Objects to Work; Deriving a New Class; Declaring a TextField Object; The init()Function, the new Operator; Java Constructors; Declaring a Button Object; Handling Java Events; Grid Layout; Check Boxes; Radio Buttons; Panels; Scroll-bars; Choice Controls; Scrolling Lists; GridBag Layout; Pop-up Windows; The Frame Class; Menus; Dialog Boxes

References :

1. Mastering the Internet by Glee Harrah Cady et al (SYBAX - Second Edition)
2. Java Programming by Steven Holzner (M&T-96)
3. Learning to Use the Internet by Ackermann (BPB-96)
4. TCP/IP Volume I by Douglas E. Comer (PHI-96)

MCA313-4(a) ARTIFICIAL INTELLIGENCE, EXPORT SYSTEM AND NEURAL NETWORKS (Marks 50, Hours 3)

Introduction : (5%)
Problems and Problem spaces : (5%)
Basic Problem Solving Methods : (10%)
Game Playing : (5%)
Knowledge Representation using Predicate Logic : (10%)
Knowledge Representation using Other Logic : (10%)
Structured Representation of knowledge : (10%)
Natural Language Understanding : (5%)
Expert System Development Process : (10%)
Prolog OR Lisp Programming : (15%)
Artificial Neural Networks : (15%)

How brains differ from computers, the LMS learning procedure, single layer and multiple layer perceptrons, hopfield nets,Backpropagation learning and its applications

MCA313-4(b) TRANSLATOR DESIGN (Marks 50, Hours 3)

Introduction : Programming languages, Translators, Models of a compiler
Notations and Concepts of Languages and Grammers :
Scanning process, elementary scanner design and implementation
Top-Down Parsing , Bottom-up parsing :
Symbol Table Handling :
Run time operations :
Intermediate form of source program .
Compiler - Compilers.

MCA313-4(c) MICROPROCESSOR APPLICATIONS (Marks 50, Hours 3)

1. **Intel 8086/88 Architecture (30%) :**

A. 8086 architecture : CPU architecture, Internal operation, Machine language instructions, Addressing modes, Instruction format, Instruction execution, timing.

B. Programmable Peripheral Devices : Serial (asynchoronous, Sychronous) Communication interface, Physical communication standards, 8251A serial interface, parallel communication (8255A), Timer (8254), Keyboard & Display controller , DMA controller, Diskette controller.

2. **Intel 8086/88 Programming (45%) :**

A. Assembly language programming : Assembler instruction format, Data transfer, Arithmatic, Branch, Loop, NOP, HALT, Flag manipulation, Logical, Shift & Rotate instructions, Directives and operators, Assembly process, Translation of assembly instructions

C. Modular programming . linking & relocation, Stacks, Procedures, Interrupts and interrupt routines, Macros Program design, program design example

D. Byte & String manipulations : String Instructions, REP prefix, Text editor example Table translation, Number format conversion.

E. I/O programming : Fundamental I/O considerations, Programmed I/O, Interrupt driven I/O, Block transfers and DMA, I/O design example

3. **Study of the contemporary microprocessors :**

Like 80286/287, 80386, 80486, Pentium (25%)

References : Microprocessors and Interfacing by Bouglas V. Hall (McGraw-Hill 92)

Microcomputer Systems : The 8086/8088 Family by Yu-cheng Liu et.al (PHI-90)

MCA313-4(d) MULTIMEDIA SYSTEMS (Marks 50, Hours 3)

- INTRODUCTION TO MULTIMEDIA
- SCANNING OF OBJECT
- INTRODUCTION TO CREATION OF GRAPHICS
- RECORDING, SAVING & PLAYING SOUND FILE
- INTRODUCTION TO ANIMATION
- CREATING MULTIMEDIA PRESENTATION USING GRAPHICS, MUSIC, SOUND EFFECTS, TEXT SYMBOLS, ANIMATION
- CREATING INTERACTIVE PRESENTATION
- CREATING SCRIPT FILE USING GUI
- SCRIPT PLAYBACK FOR TELEVISION PRODUCTION
- MULTIMEDIA PRODUCTION FOR BUSINESS PRESENTATION INTERACTIVE APPLICATION/PRESENTATION
- REATION OF STANDALONE .EXE FILE OF PRESENTATION WHICH CAN BE INSTALLED AND RUN UNDER WINDOWS
- CREATING A PRODUCTION : A Project which includes the following. : Wipes & Transition Adding Graphics, Timing, Page information & Settings, Shuffler View, Opening, Saving & running a script; Quick Access button;

Background images, Video transparancy Adjusting the size; Handling text; working with Clips, Using Animation & Digitized Video, Using Sound; Creating Interactive buttons; MIDI files, Animation Compression, MPEG animation.

MCA 313-4(e) GROUPWARE TECHNOLOGIES II (Marks 50, Hour 3)

1. **Setting up a Mobile User :**

A Remote User: Creating a New Replica; Selective Replication, Setting Up for Mobile Replication, Mobile Mail; Using the Replicator Page, Using Advanced Documents Tools, Using Advanced Mail Tools; Automating Applications; Creating and Customizing Databases

2. **Advanced Application Development :**

Workflow Applications, Multi-Database Applications; Managing Application Design Elements Using Templates; Writing Multi-Line Formulas with @ Functions : Formula Control; List Manipulation; Accessing Data Dynamically : Using Enviroment Variables; Accepting Data Using Dialog Boxes; Looking Up Data; Implementing Workflow Using Mail Routing : Setting Up Mail Routing : Mail-Enabling a Database; Designing Forms for Mail Routing; Automating Mail. Controlling Access in Application Design; User Roles; Computed Subforms; Using Internal and Reserved Fields; Manipulating Reserved Fields; Enhancing Data Entry : Layout Regions; Forms in Dialog Boxes; Using Views to Enhance the Application : Selecting Documents to Display in Views, View Column Formulas; Form Formulas; Personal on First Use Views; Displaying Views in Dialog Boxes; Automating Applications Using Agents : Creating Agents for Automation, Creating More Complex Agents; Secutiry Consideration : View and Form Access Lists, Readers and Authors Fields, Electronic Signatures; Encryption

3. **Advanced System Administration :**

Distinguished Naming, Cross Certification; Certifying Organisations; Communicating with Other Domains; Managing Multi-Domain Address Books; Merging Domains; Splitting Domains; Monitoring : Server Activity; Database Monitoring; Tracing Network Connections; Security Considerations; Introduction to the Internet for use in closed Groupware Systems; Web Navigator; Web Publisher

References :

1. Application Developers Manual Series 4 (LOTUS)
2. System Administrators Manual Series 4 (LOTUS)
3. Database Administrators Manual Series 4 (LOTUS)
4. Programmers Manual Series 4 (LOTUS)

MCA313-4(f) PERFORMANCE EVALUATION OF COMPUTER SYSTEM

(Marks 50, Hours 3)

1. **Performance Evaluation (25%) :**

Performance measurement using monitors and simulators. Performance prediction using simulators and analytical models. Scheduling algorithms.

2. **Basic Principles of Model-building (30%) :**

The use of a model for evaluation and prediction - what is model building - specific problems of computer systems modelling - Hardware and software monitor - The techniques of model analysis (Operations,analysis,models with simple queues, network of queues, discrete event simulation. Applications : architecture design, choice of configuration, prediction of performance.

3. **Balancing Personnel and Hardware (10%) :**

Effect of installation mission on personnel level and personnel types-Personnel level versus monthly hardware rental costs - Effect of computer availability on total cost- mathematical model ralating personnel, hardware size, and installation mission - Recruiting implications of hardware - personnel balance.

4. **Software Evaluation and Selection (15%) :**

Factors affecting make-or-buy decisions on software-unbundling and its effect on software procurement - Contractual aspects of purchasing software - selecting appropriate language and services - Cost of program conversion - Mathematical model for the programming - conversion decision. Computer selection techniques.

5. **Social & Legal Environment (20%) :**

Social implications - Computers and employment data - privacy, data security, computers and human understanding, and Information access policy.

MCA313-4(g) SOFTWARE PROJECT MANAGEMENT (Marks 50, Hours 3)

Software and Software Engineering
Computer System Engineering
Software Project Planning
Requirement Analysis and Methods
Software Design
Data-flow Oriented Design
Data-structure Oriented Design
Programming Lnaguage Coding
Software Quality Assurance
Software Testing Techniques
Software Testing Stratagies
Software Maintenance

MCA313-4(h) OBJECT ORIENTED ANALYSIS AND DESIGN METHODOLOGIES

(Marks 50, Hours 3)

1. **Software Development Approaches and limitations of each.** (5%)
2. **Object Oriented Analysis and Design :** (10%)
   - Concepts : Inheritance, Polymorphism, Encapsulation
   - Why Object Oriented Analysis and Design
   - Introduction to various methodologies
3. **Object Oriented Analysis and Design Methodologies in detail :** (50%)
   - Object Modelling Technique by Rumbaugh et. al.
   - Object Modelling
   - Dynamic Modelling
   - Functional Modelling Analysis, System Design, Object Design
   - Grady Booch's Methodology
   - Use Case Methodology by Jacobson
   - Methodology . Rational Corporation, U.S.A
4. **Study of Information System using any one methodology :** (35%)

5. **Object Oriented Programming Langauges :** (5%)

   Features of Object Oriented Programming Languages like SmallTalk, C++, Visual C++, Object COBOL, Eifel e.c.

6. **Object Oriented Data Bases :** (5%)

   Features of Object Oriented Data Bases

7. **Standards :** (10%)

   Object Modelling Group ORB, CORBA Architecture

   SOM and DSOM by IBM

   COM by Microsoft Corporation, U.S.A.

MCA 315 PRACTICAL WORK

The practical work will pertain to the two Electives chosen by the candidate.

MCA316 SYSTEM DEVELOPMENT PROJECT - I

OBJECTIVES OF THE COURSE

To provide the students with experience in analysing, designing, implementation and evaluating information systems

INSTRUCTIONAL NOTES

Students are assigned one or more system development projects. The projects invovle part or all of the system development cycle. Students work in teams to acquire practical the behavioral considerations in systems development

The work parallels other coures in the final year of the degree program. The activity should be extended over two semesters The information analysis portion of the projects should begin in [illegible] semester, as soon as the students have sufficient capability to begin applying information analysis techniques. Projects should be completed and documented in the 6th semester. Once a team has completed its projects, a team in a subsequent class can expand on it, obtaining experience in the revision and sophistication of existing computer based systems. The following [illegible] possible alternatives for project.

ALTERNATIVES

1. **Development of a System for a Local Firm :**

   Under supervision of the faculty and the systems analysis staff, students develop a small applications for a computer - based management information system for a local firm. Students might also work as members of established client company teams.

2. **Development of a System for a University/College :**

   Under the supervision of the faculty and the university administrative data processing unit, students develop a system to benefit the university Examples are: alumni record and follow - up system, bookstore ordering/accounting, classroom scheduling system

3. **Development for a Hypothetical Application :**

   Students develop an application for a hypothetical firm and prepare system development deliverables

MCA321 SYSTEM DEVELOPMENT PROJECT - II

OBJECTIVES OF THE COURSE

To provide the students with experience in analysing, designing, implementation and evaluating information systems

INSTRUCTIONAL NOTES

Students are assigned one or more system development projects The projects invovle part or all of the system development cycle Students work in teams to acquire practical the behavioral considerations in systems development

The work parallels other coures in the final year of the degree program. The activity should be extended over two semesters The information analysis portion of the projects should begin in the 5th semester, as soon as the students have sufficient capability to begin applying information analysis techniques. Projects should be completed and documented in the 6th semester.

Once a team has completed its projects, a team in a subsequent class can expand on it, obtaining experience in the revision and sophistication of existing computer based systems The following are possible alternatives for projects

ALTERNATIVES

1. **Development of a System for a Local Firm :**

   Under supervision of the faculty and the systems analysis staff, students develop a small applications for a computer - based management information system for a local firm. Students might also work as members of established client company teams.

2. **Development of a System for a University/College :**

   Under the supervision of the faculty and the university administrative data processing unit, students develop a system to benefit the university Examples are : alumni record and follow - up system, bookstore ordering/accounting, classroom scheduling system

3. **Development for a Hypothetical Application :**

   Students develop an application for a hypothetical firm and prepare system development deliverables

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Regulations for the Degree of Master of Computer Application (M.C.A.)
w.e.f. academic year 1997-98

R. PG. MCA 1 :

Candidates for admission to the 3 - Year Master of Computer Applications (M.C.A.) course must have passed a Bachelor's degree examination under (10+2+3) pattern either in science or commerce or management or social science or engineering (including technology) or equivalent with at least II class and having obtained not less than 50% marks at the University examination of this University or any other examination recognised as equivalent thereto by this University Under Social Science all Arts graduates except those having graduated with languages as major subjects will be considered eligible for admission

R. PG. MCA 2 :

The admission to the course will be given by merit obtained in a common admission test conducted by this University

R. PG. MCA 3 :

[illegible] M.C.A. course will be conducted under the Semester system. For this [illegible] academic year will be divided into two semesters

R. PG. MCA 4 :

[illegible] candidate who has passed an equivalent examination from any other University or [illegible] and is seeking admission to the MCA course shall not be admitted without [illegible] the Eligibility Certificate from the [illegible] University

R. PG. MCA 5 :

[illegible] be admitted to any semester examination for Master of Computer Applications and [illegible] certified by the Designated Authority which is the Head of the University Department or Principal of an affiliated college of the University

[illegible] attendance [illegible] of study to the satisfaction of the designated authority

[illegible] good conduct and character during the studies

R. PG. MCA 6 :

Candidates desirous of appearing at any semester examination of the M.C.A. course must [illegible] applications in the prescribed form to the Registrar through the designated authority [illegible] before the prescribed date

R. PG. MCA 7 :

For any semester the maximum marks for the internal and external assessments shall be [illegible] the purpose of internal assessment sessional [illegible] scheme [illegible] assessment may be used by a department. When two tests [illegible] in each subject may be [illegible] maximum [illegible] obtained [illegible]

R. PG. MCA 8 :

A candidate will be promoted to the subsequent semester according to the following scheme.

(a) A candidate, who has registered for the first semester examination will be permitted to prosecute his study for the second semester.

(b) A candidate, who has cleared all the subjects of the first semester and who has registered for the second semester examination will be permitted to prosecute his study for the third semester.

(c) A candidate, who has cleared all the subjects of the second semester and who has registered for the third semester examination will be permitted to prosecute his study for the fourth semester.

(d) A candidate, who has cleared all the subjects of the third semester and who has registered for the fourth semester examination will be permitted to prosecute his study for the fifth semester.

(e) A candidate who has cleared all the subjects of the fourth semester and who has registered for the fifth semester examination will be permitted to prosecute his study for the sixth semester.

R. PG. MCA 9 :

No candidate will be allowed to reappear in a semester examination in which he has already passed. However the candidate having ATKT will have the option to either reappear in all the ... to appear in only the subjects in which he has failed.

If ... a candidate exercises the option to appear in all the subjects, the marks obtained by him ... theory and practical/viva examination at the earlier examinations at the same semester will st... extinguished.

R. PG. MCA 10

(i) To pass a subject in any semester a candidates must obtain a minimum of 40% of marks ... head of the subject and 45% of the aggregate of the subject. When a candidate has failed ... marks in the sessional and term work head will be carried forward provided the ... has secured a minimum of 40% marks in the head.

... having Practical/... of the heads of passing, if a candidate fails in the ... in the Practical/V head, he will have the option to either reappear in ... examination or to allow the marks obtained in this head to be carried forward. If such a candidate exercises the option to reappear in the Practical/VV examination, the marks obtained by him in the same head at the earlier examinations will stand extinguished.

(ii) A candidate will be eligible for award of First Class with Distinction, First Class or Second Class only if he passes in all the subjects of the Fourth, Fifth and Sixth semester examination at one sitting. If a candidate passes either the Fourth or the Fifth or the Sixth semester examination in parts, he will be awarded Pass class only.

For award of class the aggregate marks will consist of the sum of the following :

(a) The sum of the Total marks of Fifth and Sixth semester taken together

(b) Four times the percentage of marks obtained at the Third & Fourth semester examinations taken together

(c) The percentage of marks obtained at the First & Second semester examinations taken together

In summary the aggregate marks will be the sum of the following components :

(A)	MCA V + VI		Full marks (full marks obtained)
(B)	MCA III IV	400	Convert marks obtained to 4 times %age
(C)	MCA I + II	100	Convert marks obtained to percentage

Using the aggregate marks calculated as per the above scheme a class will be awarded as follow:

(1) 70% or more marks - First Class with Distinction
(2) 60% or more marks - First Class
(3) 50% or more marks - Second Class

પરિશિષ્ટ '૧૮'

કામકાજ ક્રમાંક ૨ (૧૮)

GEOLOGY

M.Sc. Part II

New Syllabus in force from June, 1997

Paper I : Economic geology, Principles of ore genesis, Mining geology, Exploration methods, Pre-cambrian geology of India.

Paper II : Igneous petrology, Metamorphic petrology, Sedimentary petrology, Geochemistry.

Paper III : Engineering geology, Hydrogeology, Environmental geology, Principles of remote sensing techniques, Clay mineralogy, Surveying methods.

PAPER I :

1·1 Economic Geology :

1·1·1 Development of economic geology.

1·1·2 Geological distribution and classification of mineral deposits. Mineral deposits–their form, structure, association, stability and workiability. Ore, gangue, grade, tenor, etc.

1·1·3 Characteristics distribution and diagnostic features of metallic and non metallic mineral deposits. Mineral fuels. Fertilizer's and atomic energy mineral fuels. Fertilizer's and atomic energy minerals. Precious and semi-precious stones.

1·1·4 Metallogenetic pravinces and epochs in India.

1·2 Principles and processes of ore genesis :

1·2·1 Controls of are localisation. Theories of transportation and deposition of ores. Physicochemical controls of are deposition. Modes of concentration.

1·2·2 Wall rock alteration, paragenesis, zonal distribution, geothermometry Stability of minerals.

1·2·3 Charecteristics of syngenetic, epigenetic, sedimentary, residual and supergene enrichment deposits.

1·2·4 Metamorphism of ores. Mineral associations.

1·3 Mining Geology :

1·3·1 Mines. Methods of samplings, calculation of average grade, estimation of ore reserves, dressing and beneficiation.

1·3·2 Mining methods alluvium, open cast, underground Coal mining.

1·3·3 Mine evaluation, Mineral economics and its concepts. Valuation of mines.

1·3·4 National mineral policy, Conservation and substitution. Development of mining and mineral industry in India.

1·4 Exploration Methods

1·4·1 Principles of geological, geochemical and geophysical exploration methods.

1·4·2 Geophysical exploration methods general principles, nature of physical properties, units of measurements, equipments, etc Geophysical anomalies.

1·4·3 Classification of geophysical methods Radioactive methods and other important methods of prospecting.

1·5 Pre-Cambrian Geology of India :

1·5·1 Chief divisions of Indian subcontinent and their Physiography

1·5·2 Pre-Cambrian crustal provinces shields platforms, proterozoic mobile belts etc Archaean and proterozoic provinces of India structural framework, stratigraphy, ... chronology correlation and world distribution of Archaean rocks

1·5·3 Classification of Pre-Cambrian era Archaean system : its distribution and classification in Peninsula and extra-Peninsula, their correlation and economic importance. Igneous activity in the Archaeans.

1·5·4 Dharwar supergroup Cuddapah, Delhi and Vindhyan super groups their distribution, classification, age correlation and economic importance in Peninsula and extra-Peninsula.

PAPER II :

2·1 Igneous Petrology

2·1·1 Distribution of elements in the earth's crust. Origin and evolution of m...

properties of magma temperature, density, viscosity, thermal conductivity, heat capacity and liquid compressibility

2.1.2 Differentiation, assimilation and syntexis

2.1.3 Crystallisation of basaltic and granitic magmas and petrographic significance.

2.1.4 Representation of chemical analysis of rocks. Calculation of norm, niggli value.

2.1.5 Granitisation and granite tectonics

2.1.6 Chemistry, mineralogy and petrogenesis of pegmatites, alkaline rocks, carbonatites, anorthosites, ultra-basic rocks, lamprophyres and related rocks. Spilite-Kerato-phyre association

2.2 **Metamorphic petrology :**

2.2.1 General characters and scope of metamorphism.

2.2.2 Mineralogy of metamorphic rocks. Textures and structures of metamorphic rocks.

2.2.3 Chemical equilibrium in metamorphic rocks (equilibrium reactions) phase rules. Retrograde metamorphism

2.2.4 Metamorphic facies (of regional and contact metamorphism). Zones and grades of metamorphism. Classification of metamorphic rocks

2.2.5 Metamorphic diffusion and differentiation

2.2.6 Migmatites, ptygmatic folding, metasomatism, metamorphism and ultrametamorphism

2.2.7 Thermodynamic principles of metamorphic reactions. Preferred orientation and methods to study orientation

2.2.8 Field relation of metamorphic rocks and processes involved in their formation.

2.2.9 Relation between plate tectonics and metamorphism

2.3 **Sedimentary Petrology :**

2.3.1 Textures of sedimentary rocks-particle size, sphericity, roundness, porosity and permeability

2.3.2 Sedimentary structures and palaeocurrent analysis

2.3.3 Composition of sedimentary rocks (mineralogy). Classification of sedimentary rocks

2.3.4 Sedimentary facies, sedimentation and tectonics, sedimentary differentiation. Diagenesis [illegible]

2.3.5 [illegible] of sedimentary [illegible]

2.3.6 Sedimentary environments and provinance-types. Significance of climate on sedimentation

2.4 **Geochemistry :**

2.4.1 Development and scope of geochemistry

2.4.2 Cosmic abundance of elements, composition of meterites

2.4.3 Geochemical structure of the earth. Principles of chemical thermodynamics

2.4.4 Geochemistry of magmatic crystallisation process

2.4.5 Sedimentation as a geochemical process (oxidation-reduction)

2.4.6 Geochemical aspects of metamorphism and metasomatism

2.4.7 Principles of instrumental analytical techniques-UV spectrophotometer, AAS, [illegible]

PAPER III

3.1 Engineering Geology

3.1.1 Engineering properties of rocks and their applications

3.1.2 Geology applied to engineering problems such as Foundations, Damsites, Reservoirs, Highways, Building structures, Tunnels, Landslides, Excavations.

3.1.3 Geology of construction material

3.1.4 Case histories of engineering problems

3.1.5 Elements of soil mechanics

3.1.6 Principles of terrain evaluation and environmental monitoring of engineering projects

3.2 **Hydrogeology :**

3.2.1 Hydrological cycle, ground water in hydrological cycle. Runoff cycle

3.2.2 Origin types and position of groundwater. Sub-surface classification of ground water.

3.2.3 Classification and hydraulic characteristics of aquifers.

3.2.4 Quality of ground water. Exploration methods for ground water and ground water development studies.

3.2.5 Detailed studies of ground water occurrences in igneous, metamorphic and sedimentary rocks.

3.2.6 Elementary theory of ground water flow. Darcy's law

3.2.7 Artificial recharge of ground water. Water resources management. Sea water encroachment on aquifers-its preventions and examples

3.3 **Environmental Geology :**

3.3.1 Nature and scope of environmental geology. Influence of geological characteristics on human life.

3.3.2 Earth resources-renewable and non-renewable

3.3.3 Environmental impact of mining, construction and land use

3.3.4 Waste disposal problems

3.3.5 Environmental planning and management

3.3.6 Geology as applied to urban planning

3.4 **Principles of remote sensing techniques :**

3.4.1 Aerial photogeology. Characteristics and stereoscopic study of aerial photos

3.4.2 Various features of aerial photographs. Aerial mosaics

3.4.3 Interpretation of aerial photos-lithological, structural and geomorphological

3.4.4 Introduction to the use of aerial photographs in geological mapping, mineral exploration, engineering geology and ground water exploration

3.4.5 Principle of remote sensing

3.4.6 Applications of satellite imageries in geology and geomorphology

3.5 **Clay Mineralogy :**

3.5.1 Types and structures of clay minerals

3.5.2 Methods of identification-optical, X-ray, thermal and differential thermal analysis

3.5.3 Properties, source and environment of clays

3.5.4 Applications of clay minerals in engineering fields

3.6 **Surveying Methods :**

3.6.1 Principles of surveying methods

3.6.2 Chain, compass, plane table, theodolite, altimeter, level surveying methods

3.6.3 Level [illegible]

3.6.4 [illegible] collection of data [illegible] in the field. Sampling and labelling

3.6.5 Detailed [illegible] mapping [illegible] compass and Brunton compass

3.6.6 Computation and [illegible]

PRACTICALS

[illegible]

પરિશિષ્ટ '૧૯'

કામકાજ ક્રમાંક ૨ (૨૦)

T.Y.B.Com.

Dissertation topics in **Advanced Business Management Paper V for the year 1997-1998.**

1. Analysis of marketing mix of a consumer product.
2. A comparative study of the distribution channels of an industrial and a consumer product.
3. Study of brand equity of any consumer product.
4. problems and prospects of rural marketing in India.
5. Critical evaluation of an advertising agency.
6. Comparative study of the capital structure of two large scale manufacturing enterprises.
7. Study of any specialised financial institution viz. SIDBI, NABARD, IDC.
8. Problems of a manufacturing exterprise in rural area.
9. Quality control system in a service entefprise.
10. Study of a public utility unit.
11. Issues in privatisation of Indian Public enterprises.
12. Comparative study of alternative funding patterns of two academic institutions.
13. Human resources development practices in any large enterprise.
14. Evaluation of motivational policies of a business enterprise.
15. Profile of a not for profit non-governmental organisation.
16. Evaluation of pricing function in any public service.
17. Study of production function in any multi product enterprise.
18. Profile of a consumers' or Producers' co-operative enterprise.
19. Total Quality management-concept and its application.
20. A comparative study of decision making in a private and public sector unit.

Note

1. The dissertation must have a minimum of 40 type written pages in double spacing.
2. For theoretical topics a student should refer to atleast 5 books and 10 periodicals.
3. The dissertations should be submitted on or before 31st March, 1998.

પરિશિષ્ટ '૨૦'

કામકાજ ક્રમાંક ૨ (૨૧)

Course Structure for Post-graduate Diploma in Investment and Financial Analysis

Revised course from June, 1997

Semester I

1. Financial Management
2. Accounting for Managers
3. Business Economics and Quantitative Techniques
4. Financial Markets and Financial Services

Semester II

5. Security Analysis and Portfolio Management
6. International Finance
7. Economic Legislation
8. Project Management
9. Project Report.

Course I : Financial Management

Financial Management Overview :

— Goals of financial management
— Finance Manager's role in a firm
— Indian Financial System

Valuation Concepts in Financial decisions :

(i) Time value of money—compound value, future values, net present value
(ii) Present value of bonds and shares
(iii) Risk and Return—theory, evidence and application.

Capital Budgeting Decisions :

(i) Simple and Complex decision—capital budgeting decisions and uncertainity
(ii) Cost of capital

Financing and Dividend Policies :

(i) Financial and Operating Leverage
(ii) Capital Structure and theories
(iii) Dividend theories and policies

Working Capital Management :

(i) Principles of Working Capital
(ii) Cash Management
(iii) Management of accounts receivables
(iv) Management of inventories
(v) Regulation of Bank Finance : Bank Finance and its regulations, recommendations of different committee

Long Term Finance :

(i) Equity Share Capital—recent trends in equity finance
(ii) Debt as a course of finance
Different kinds of debt
Innovations in debt market
Yield to maturity
Debt refuncing decision.

Course II : Accounting for Managers

Accounting concepts, conventions, principles and standards

Managerial uses of Annual Financial Statements including cash flow and fund flow statements and preparation of cash budget—Evaluation of Divisional performance

Meaning and scope of Management Accounting :

(a) Accounting for planning—Various concepts of cost and cost classification-CVP analysis.
(b) Accounting for decision making—variable costing, concept of Relevant cost.
(c) Accounting for control—budgetary control—variance analysis

Course III : Business Economics and Quantitative Techniques

(a) Scope and method of business economics, its difference from traditional economics.

[illegible] Fundamental concepts [illegible] incremental concept, marginal concept, time perspective, opportunity cost.

Demand analysis and demand forecasting, market demand and elasticity, price, income and cross elasticity measurement. Business and economic forecasting, techniques of forecasting (description only)

Production and costs, meaning of production function, variable inputs and output variation, optional combination of inputs for profit maximisation.

Cost [illegible] the difference between accounting cost and economic costs. Cost functions : Short term cost and their use in decision making, breakeven analysis, long term costs, economics and diseconomies of scale—learning curve

Price and output determination, Market structure economics of price determination, pure competition, monopoly, selling and promotional expenses, oligopolistic behaviour, interdependences, [illegible] and price leadership, pricing of multiple products. Price discrimination, transfer pricing, pricing practices.

Government and business (microeconomics), the need for government's intervention in [illegible] price controls, support price and administered prices, prevention and control of monopoly and restricted trade practices. Need for development of institutional finance, Protection of consumers interest, planning as guide to overall business development.

[illegible] and business (microeconomics), Basic Keynesian model of income determination, fiscal [illegible] interest rate and prices. IS-LM-FE model, Globalisation of business and [illegible]

Quantitative Techniques : Descriptive Statistics, co-relation, Regression—multiple regression, [illegible] functions probability.

[illegible] on the application of statistics in Managerial ddecision making is expected rather [illegible] of more illustrations

Course IV : Financial Markets and Financial Services

[illegible] Markets :

[illegible] of financial [illegible] —Capital markets and capital market Instruments.

Money market & Money Market Instruments—Recent Instruments in the Financial Markets of India

Government Securities Market

Stock Market, OTCEI & National Stock Exchange.

Securities Contracts (Regulation) Act and the role of SEBI in regulation and development of Capital Market.

Financial Services : Financial Services and Economic Environment

- Leasing : Introduction—Legal & tax aspects, financial evaluation, Accounting and Reporting for leases, lease structuring and lease agreement.

Hire Purchase : Concept and features Flat and effective rates of interest Diff. between Hire Purchase & lease.

Factoring : Introduction and Features. Legal aspects, cost of factoring Recent developments in the Indian context—factoring Vs Bill discounting.

Real Estate Planning : Overview of financing methods & Institutions, Mortage—Traditional and Non traditional valuation of real estate & measurement of risk, Mortage backed bonds, Collateralised mortage obligations—Real Estate financing in India.

- Venture Capital : Concept & Characteristics—Evaluation of new project ideas & technology, innovation, Experience of VC Industry in U.S.A., VC Industry in India, Venture Capital schemes & guidelines, Tax & legal aspects.

Merchant Banking : Functions of a Merchant Banker, Role of Merchant Banker, Modes of raising Capital from primary marketing, pricing of Public issues.

Consumer : Introduction, credit cards, financing schemes for consumer durables.

Course V : Security Analysis and Portfolio Management

(a) Security Analysis

(i) Investment Avenues

(ii) Market for Securities

(iii) Framework of Risk and Return :

—Security Return & Valuation

—Risk in Holding Securities

(iv) Valuation of Equity shares :

—Economic Analysis

—Industry Analysis

—Copany Analysis

(v) Technical Analysis & coefficient market Theory.

(vi) Fixed Income securities—Performance Evaluation of fixed income securities.

(vii) Options & futures—Black-scholes' option Model

(viii) Warrants Convertibles.

(ix) Public Sector—disinvestment of shares and pricing of the same.

(b) Portfolio Management :

An overview of Traditional Theory

Behaviour of stock Market Prices

Efficient Market Theory

Modern Portfolio Theory

CAPM & Arbitrage pricing theory

Portfolio Analysis

Portfolio Selection—Risk & Livestock preference and constructing the Best portfolio

Portfolio Performance Analysis

Equity portfolio Management

Bond portfolio Management

Individual portfolio Management

Portfolio Management & Mutual funds.

Course VI : International Finance

1. International Monetary and Financial System
   (a) Bretton woods, IMF and the World Bank
   (b) Exchange Rate Regimes
   (c) Problem of Liquidity and Collapse of fixed rate system
   (d) European Monetary system
   (e) Euromarkets
   (f) Balance of payments—components of Bop. Meaning of Deficit and Surplus BOP.
2. Overview of Foreign Exchange Market
   (a) Structure and participants—communication system
   (b) Exchange Rates quotations—Direct and Indirect Rates—Bid and offerred Rates. Spot and forward rates—swap deals—interest parity.
   (c) Foreign Exchange market in India-Brief history of Rupee exchange rates-role of RBI—Methods of quoting rates in India. Exchange Margin—forward exchange contracts—booking, execution, cancellation and extensions
3. Currency Futures :
   (a) Futures contracts, markets and trading process
   (b) Hedging and speculation with currency futures
4. Foreign Currency Options :
   (a) Option Contracts
   (b) Option pricing and Hedging
5. Exchange rate determination :
   (a) Theories of exchange rate determination
6. International Financial Market
   [illegible] Euromarkets, (b) major funding [illegible] syndicated bank loans, bonds, [illegible] paper, Note issues. (c) International equity [illegible] financing in International Markets : GDR issue.

7 Interest Raste risk management :

(a) Nature of interest rate exposure

(b) Forward Rate agreements

(c) Interest rate options, caps, floors, collars

(d) Interest raste swaps.

8 Foreign Trade Finance :

(a) Methods of payments in foreign trade

(b) Letters of Credits—Types of LCS Negotiation and reimbursements—uniform custo and practices for documentary credits.

(c) Documents in foreign trade, Transport documents—Invoice—Marine insurance—forei bills of exchange.

(d) Financing of exports and imports in India—Packing credits—post—shipme finance—rupee and foreign currency borrowings.

9. International Financial Institutions :

(a) World Bank, IMF, IFC, IDA, IBRD

(b) Regional organisation, such as Asian Bank, European Investment Bank etc.

Course VII : Economic Legislations

1. Companies Act, 1956 : Meaning and characteristics of company–company as distinguished from other forms of busines–types of companies, foreign companies–Govt. companies Holding and subsidiary Cos. investment cos. finance cos. section 25 cos.–private and public Ltd. cos.–constitution of the company, incorporation–Memorandum and Articles of Association–conversion of private co. into a public co–deemed public co.–commencement of business,–Share capital and debentures–meaning, types, issue and allotment of shares–declaration and payment of dividends–transfer of shares–public deposits, loans and investments–Rules for acceptance of public desposits.
2. Negotiable Instruments Act : Deginition of negotiable instrument–promissory note–Bill of exchange–cheque–holder and holder in due course–Section 123, Section 138, crossing and endorsements–noting and protesting.
3. Securities and exchange Board of India :
   Guidelines in relation to protection of interest of investors, guideliness for public issues, —objections, powers and functions of SEBI.
4. Security Contract Regulation Act 1956 :
   —Objectives of SCRA–Sections 2 (h), 2 (j), 3, 4, 5, 7, 7 (A), 13, 13 (A), 14, 19 and Listing of Securities in the stock exchange.
5. Foreign exchange regulation Act, 1973 : Provisions relating to NRI investment–distribution of equity and dividend.
6. Income Tax Act :
   —Corporate taxation and dividend
   —Heads of Income–Business deductions and allowances
   —Rent, repairs, taxes insurance for buildings (Sec. 30) repairs and insurance of machinery, pant and furnitures (Sec. 31) Depreciation allowance (Sec. 32) amortisation of expenses.
   —Interest on borrowed capital–bad debts–carry forward and set off of losses–Minimum alternate tax–Ascertainment of book profit.
7. The Indian Contract Act 1872 : Nature of contract consideration, Essentials of a valid contract–performance of contract–indemnity and guarantee Bailment and pledge, contract of agency.

Course VIII : Project Management

1. Project Planning : (a) Overview (b) Resources Allocation Framework (c) Generation of project ideas.
2. Project Analysis : (a) Market and Demand Analysis (b) Technical Analysis (c) Financial Analysis.
3. Basic Concepts : (a) Project cash flow (b) Appraisal criteria (c) Analysis of risk.
4. Techniques : Risk Analysis, Social cost Benefit Analysis, multiple projects.
5. Implementation : Project Financing–network techniques–Project review–Tax implications.

પરિશિષ્ટ '૨૨'

કામકાજ ક્રમાંક ૨ (૨૪)

નં. એકેડેમિક-૧૧૬૬-૧૯૯૬
ગુજરાત યુનિવર્સિટી કાર્યાલય,
અમદાવાદ-૯. તા. ૧૦-૬-૧૯૯૬

પ્રતિ,

વિનયન, વિજ્ઞાન, વાણિજ્ય અને શિક્ષણશાસ્ત્રની સંલગ્ન કૉલેજોના આચાર્યશ્રીઓ તથા યુનિવર્સિટી વિદ્યાભવનોના અધ્યક્ષશ્રીઓ.

શ્રીમાન,

શૈક્ષણિક વર્ષ ૧૯૯૬-૯૭ માટે સત્રોની ગોઠવણી ઑર્ડિ. ૭૫માં જે નિયત કરવામાં આવી છે તેનાથી નિરપેક્ષ રહીને નીચે પ્રમાણે રાખવા કુલપતિશ્રીના આદેશાનુસાર જણાવવામાં આવે છે :

૧. પ્રથમ સત્ર — તા. ૨૪-૬-૧૯૯૬થી તા. ૨૭-૧૦-૧૯૯૬

૨. દિવાળી વેકેશન — તા. ૨૮-૧૦-૧૯૯૬થી તા. ૧૭-૧૧-૧૯૯૬

૩. દ્વિતીય સત્ર — તા. ૧૮-૧૧-૧૯૯૬થી તા. ૭-૪-૧૯૯૭

૪. પ્રથમ કસોટી — ૫૦ માર્ક્સની એક કલાકની આંતરિક વિકલ્પ પદ્ધતિ દ્વારા પ્રથમ સત્ર દરમિયાન તા. ૨૭-૧૦-૧૯૯૬ સુધીમાં કૉલેજે ગોઠવવી.

૫. દ્વિતીય કસોટી ત્રણ કલાકની તથા વધારાની કસોટી બીજા સત્ર દરમિયાન કૉલેજોએ પોતાની અનુકૂળતા મુજબ પરંતુ પહેલી માર્ચ પહેલાં ગોઠવવી.

૬. નોકરીનું સાતત્ય જળવાય તે હેતુથી એક કૉલેજમાંથી બીજી કૉલેજમાં જોડાનાર શિક્ષકોની નિમણૂક અને હાજર થવાની તા. ૧૫મી જૂન રાખવામાં આવી છે.

૭. ઉપર જણાવેલ પ્રમાણે સત્રોની તથા આંતરિક પરીક્ષાઓની ગોઠવણી ફક્ત વિનયન, વિજ્ઞાન, વાણિજ્ય અને શિક્ષણ વિદ્યાશાખાની સંલગ્ન કૉલેજો તથા યુનિવર્સિટીનાં વિદ્યાભવનો અને અનુસ્નાતક કેન્દ્રોને લાગુ પડે છે.

આપનો વિશ્વાસુ,
કુલસચિવવતી

નકલ રવાના :

૧. વિનયન, વિજ્ઞાન, વાણિજ્ય અને શિક્ષણશાસ્ત્રની સંલગ્ન કૉલેજોના આચાર્યશ્રીઓ તથા યુનિવર્સિટી વિદ્યાભવનોના અધ્યક્ષશ્રીઓ
૨. પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૩. મદદનીશ કુલસચિવશ્રી, અનુસ્નાતક વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૪. સેક્સન ઑફિસરશ્રી, એલિજિબિલિટી વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૫. અધ્યક્ષશ્રી, શારીરિક શિક્ષણ વિભાગ, ગુજરાત યુનિવર્સિટી અમદાવાદ-૯
૬. અધ્યક્ષશ્રી, યુવક કલ્યાણ વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૭. કો-ઑર્ડિનેટરશ્રી, એન.એસ.એસ. વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૮. કુલપતિશ્રી, ઉપકુલપતિશ્રી અને કુલસચિવશ્રીના અંગત મદદનીશ ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૯. જનરલ મેનેજરશ્રી, એ. એમ. ટી. એસ. જમાલપુર, અમદાવાદ
૧૦. કુલસચિવશ્રી, ઉત્તર ગુજરાત યુનિવર્સિટી, પાટણ (ઉ.ગુ.)
૧૧. જનરલ મૅનેજરશ્રી, ગુજરાત રાજ્ય માર્ગ વાહનવ્યવહાર વિભાગ, ગીતામંદિર, અમદાવાદ.

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નં. એકેડેમિક-૧૧૭૩-૧૯૯૬
ગુજરાત યુનિવર્સિટી કાર્યાલય,
અમદાવાદ-૯. તા. ૨૧-૬-૧૯૯૬

પ્રતિ,

કાયદા વિદ્યાશાખાની કૉલેજોના આચાર્યશ્રીઓ તથા લૉ ભવનના અધ્યક્ષશ્રી,

વિષય : ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષ માટેના સેમિસ્ટર નક્કી કરવા બાબત

શ્રીમાન,

ઉપર્યુક્ત બાબત પરત્વે કુલપતિશ્રીના આદેશાનુસાર જણાવવાનું કે કાયદા વિદ્યાશાખામાં શૈક્ષણિક વર્ષ ૧૯૯૬-૯૭ માટે સેમિસ્ટરોની વ્યવસ્થા ઑર્ડિ. ૭૫માં જે નિયત કરવામાં આવી છે તેનાથી નિરપેક્ષ [illegible] પ્રમાણે ફેરફાર કરવામાં આવે છે :

૧.	મોન્સુન સેમિસ્ટર	તા. ૨૪-૬-૧૯૯૬થી તા. ૨૭-૧૦-૧૯૯૬
૨.	દિવાળી વેકેશન	તા. ૨૮-૧૦-૧૯૯૬થી તા. ૧૭-૧૧-૧૯૯૬
૩.	વિન્ટર સેમિસ્ટર	તા. ૧૮-૧૧-૧૯૯૬થી તા. ૭-૪-૧૯૯૭

નોકરીનું સાતત્ય જળવાય તે હેતુથી એક કોલેજમાંથી બીજી કૉલેજમાં જોડાનાર શિક્ષકોની નિમણૂક અને હાજર થવાની તા. ૧૫મી જૂન રાખવામાં આવી છે.

આપનો વિશ્વાસુ,
કુલસચિવવતી

નકલ રવાના :

૧. કાયદા વિદ્યાશાખાની સંલગ્ન કૉલેજોના આચાર્યશ્રીઓ
૨. સ્કુલ ઑફ લૉ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૩. પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૪. મદદનીશ કુલસચિવશ્રી, અનુસ્નાતક વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૫. સેક્સન ઑફિસરશ્રી, એલિજિબિલિટી વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૬. અધ્યક્ષશ્રી, શારીરિક શિક્ષણ વિભાગ, ગુજરાત યુનિવર્સિટી અમદાવાદ-૯
૭. અધ્યક્ષશ્રી, યુવક કલ્યાણ વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૮. કો-ઑર્ડિનેટરશ્રી, એન.એસ.એસ. વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૯. કુલપતિશ્રી, ઉપકુલપતિશ્રી અને કુલસચિવશ્રીના અંગત મદદનીશ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૧૦. જનરલ મેનેજરશ્રી, એ. એમ. ટી. એસ., જમાલપુર, અમદાવાદ
૧૧. કુલસચિવશ્રી, ઉત્તર ગુજરાત યુનિવર્સિટી, પાટણ (ઉ.ગુ.)
૧૨. જનરલ મેનેજરશ્રી, ગુજરાત રાજ્ય માર્ગ વાહનવ્યવહાર વિભાગ, ગીતામંદિર, અમદાવાદ
૧૩. ચીફ એકાઉન્ટ્સ ઑફિસર, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯.

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નં. એકેડેમિક/૧૯૯૯/૧૯૯૬
ગુજરાત યુનિવર્સિટી કાર્યાલય,
અમદાવાદ-૯ તા. ૧-૭-૧૯૯૬

પરિપત્ર :

યુનિવર્સિટી સાથે જોડાયેલી તબીબી અને ડેન્ટલ સર્જરી વિદ્યાશાખાની કૉલેજોના ડીનશ્રીઓને જણાવવાનું કે તબીબી વિદ્યાશાખાના પૂર્વસ્નાતક અને અનુસ્નાતક અભ્યાસક્રમ માટે ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષ માટે સત્ર વ્યવસ્થા નીચે મુજબ રાખવામાં આવી છે :

૧.	પહેલું શૈક્ષણિક સત્ર	તા. ૧૫-૬-૧૯૯૬થી તા. ૨૭-૧૦-૧૯૯૬ સુધી
૨.	દિવાળી વેકેશન	તા. ૨૮-૧૦-૧૯૯૬થી તા. ૫-૧૨-૧૯૯૬ સુધી
૩.	બીજું શૈક્ષણિક સત્ર	તા. ૬-૧૨-૧૯૯૬થી ૭-૪-૧૯૯૭
૪.	ઉનાળું વેકેશન	તા. ૮-૪-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૭ સુધી

૫. નવરાત્રી અને નાતાલની રજાઓ રાખવામાં આવી નથી.

કુલસચિવ,

નકલ રવાના તથા (જાણ સારૂ) :

૧. ડીનશ્રી, એન.એચ.એલ. મ્યુનિ. મેડિકલ કૉલેજ, એલિસબ્રિજ, અમદાવાદ-૬
૨. ડીનશ્રી, બી. જે. મેડિકલ કૉલેજ, અસારવા, અમદાવાદ-૧૬
૩. ડીનશ્રી, ડેન્ટલ કૉલેજ, અસારવા, અમદાવાદ-૧૬
૪. આચાર્યશ્રી, ગવર્નમેન્ટ નર્સિંગ કૉલેજ, અસારવા, અમદાવાદ-૧૬
૫. પરીક્ષા નિયામકશ્રી, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૬. મદદનીશ કુલસચિવશ્રી, પરીક્ષા વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૭. મદદનીશ કુલસચિવશ્રી, અનુસ્નાતક વિભાગ, ગુજરાત, યુનિવર્સિટી, અમદાવાદ-૯
૮. ચીફ એકાઉન્ટ્સ ઑફિસર, હિસાબ વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯

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નં. એકેડેમિક-૨૦૦૭/૧૯૯૬
ગુજરાત યુનિવર્સિટી કાર્યાલય,
અમદાવાદ-૯. તા. ૮-૭-૧૯૯૬

પરિપત્ર :

આ યુનિવર્સિટી સાથે સંલગ્ન નર્સિંગ કૉલજના આચાર્યશ્રીઓને જણાવવાનું કે, નર્સિંગ કૉલેજ માટે ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષ માટે સત્ર વ્યવસ્થા નીચે મુજબ રાખવામાં આવી છે :

૧.	પ્રથમ સેમિસ્ટર	તા. ૧-૭-૧૯૯૬થી તા. ૨૭-૧૦-૧૯૯૬
૨.	દિવાળી વેકેશન	તા. ૨૮-૧૦-૧૯૯૬થી તા. ૧૭-૧૧-૧૯૯૬
૩.	દ્વિતીય સેમિસ્ટર	તા. ૧૮-૧૧-૧૯૯૬થી તા. ૭-૪-૧૯૯૭
૪.	નાતાલ વેકેશન	તા. ૨૩-૧૨-૧૯૯૬થી તા. ૧-૧-૧૯૯૭
૫.	ઉનાળું વેકેશન	તા. ૮-૪-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૭

આપનો વિશ્વાસુ,
કુલસચિવવતી

નકલ રવાના (જાણ સારૂ) :

૧. આચાર્યશ્રી, ગવર્નમેન્ટ નર્સિંગ કૉલેજ, અસારવા, અમદાવાદ-૧૬
૨. ડીનશ્રી, એન.એચ.એલ. મ્યુનિ. મેડિકલ કૉલેજ, એલિસબ્રિજ, અમદાવાદ-૬
૩. ડીનશ્રી, બી. જે. મેડિકલ કૉલેજ, અસારવા, અમદાવાદ-૧૬
૪. પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૫. મદદનીશ કુલસચિવશ્રી, અનુસ્નાતક વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯

પરિશિષ્ટ '૨૩'

કામકાજ ક્રમાંક ૨ (૨૫)

નં. એકેડેમિક-૧૨૬૯-૧૯૯૬
ગુજરાત યુનિવર્સિટી કાર્યાલય,
અમદાવાદ-૯. તા. ૧૮-૧૦-૧૯૯૬

પરિપત્ર :

આથી ફાર્મસી વિદ્યાશાખાની કોલેજોના આચાર્યશ્રીઓને જણાવવાનું કે ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષ માટે સત્રોની વ્યવસ્થા નીચે મુજબ રહેશે :

પ્રથમ સત્ર	તા. ૧-૭-૧૯૯૬થી તા. ૩૧-૧૨-૧૯૯૬
બીજું સત્ર	તા. ૧-૧-૧૯૯૭થી તા. ૨૨-૪-૧૯૯૭
દિવાળી વેકેશન	તા. ૨૮-૧૦-૧૯૯૬થી તા. ૧૭-૧૧-૧૯૯૬
ઉનાળુ વેકેશન	તા. ૨૩-૪-૧૯૯૭થી તા. ૩૦-૬-૧૯૯૭
પ્રથમ કસોટી	તા. ૩-૧૦-૧૯૯૬થી તા. ૧૧-૧૦-૧૯૯૬
દ્વિતીય કસોટી	તા. ૨-૧-૧૯૯૭થી તા. ૧૦-૧-૧૯૯૭
અને વધારાની ત્રીજી કસોટી (રીટેસ્ટ)	તા. ૬-૩-૧૯૯૭થી તા. ૧૩-૩-૧૯૯૭

નોંધ.-૧. ઑક્ટોબર માસમાં લેવાનાર ફાર્મસી પરીક્ષાઓ તા. ૧૭-૧૧-૧૯૯૬થી શરૂ કરવી, પ્રેક્ટિકલ પરીક્ષાઓ તા. ૧૬-૧૦-૧૯૯૬થી તા. ૨૬-૧૦-૧૯૯૬ દરમિયાન રાખવી અને માર્ચની તા. ૩-૩-૧૯૯૭થી શરૂ કરવી, ઑક્ટોબર અને એપ્રિલ માસમાં પ્રેક્ટિકલ પરીક્ષાઓ પત્યા બાદ ગુજરાત યુનિવર્સિટીની થિયરી પરીક્ષા લેવાની રાખવી.

વધુમાં ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષ માટે એમ.ફાર્મ. પરીક્ષાના સત્રોની વ્યવસ્થા નીચે મુજબ રહેશે, તેની નોંધ લેશો :

૧. એમ.ફાર્મ. સેમિસ્ટર ૧ :

પ્રથમ સત્ર	તા. ૧-૯-૧૯૯૬થી તા. ૧૫-૨-૧૯૯૭
બીજું સત્ર	તા. ૧૬-૨-૧૯૯૭થી તા. ૧૫-૯-૧૯૯૭
ત્રીજું સત્ર	તા. ૧૬-૯-૧૯૯૭થી તા. ૧૫-૨-૧૯૯૮
વેકેશન	તા. ૫-૫-૧૯૯૭થી તા. ૫-૬-૧૯૯૭
૨. એમ.ફાર્મ. સેમિસ્ટર ૨ :	જૂના વિદ્યાર્થીઓ માટે તા. ૧-૭-૧૯૯૬થી તા. ૩૦-૧૧-૧૯૯૬
૩. એમ.ફાર્મ. સેમિસ્ટર ૩ :	જૂના વિદ્યાર્થીઓ માટે તા. ૧-૧૨-૧૯૯૬થી તા. ૫-૫-૧૯૯૭

આપનો વિશ્વાસુ,

કુલસચિવ વતી

નકલ રવાના

૧. ફાર્મસી વિદ્યાશાખાની તમામ કોલેજોના આચાર્યશ્રીઓ તરફ
૨. પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૩. સેક્શન ઑફિસર, પરીક્ષા વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯
૪. મદદનીશ કુલસચિવશ્રી, અનુસ્નાતક વિભાગ, ગુજરાત યુનિવર્સિટી, અમદાવાદ-૯

પરિશિષ્ટ '૨૪'

કામકાજ ક્રમાંક ૨ (૨૬)

બી.એડ. પ્રવેશ અંગેની ૧૯૯૭-૯૮ના વર્ષ માટેની આચાર્યશ્રીઓની સમિતિ તા. ૨૧-૧૨-૧૯૯૬ના રોજ બપોરે ૧-૩૦ કલાકે યુનિવર્સિટી કાર્યાલયમાં મળી હતી, જેમાં હાજરી નીચે મુજબ હતી :

૧. આચાર્યશ્રી, એ. જી. ટીચર્સ કોલેજ, અમદાવાદ	હાજર
૨. આચાર્યશ્રી, પ્રકાશ કોલેજ ઑફ એજ્યુકેશન, અમદાવાદ	હાજર
૩. આચાર્યશ્રી, એસ. યુ. જી. કોલેજ ઑફ એજ્યુકેશન	હાજર
૪. આચાર્યશ્રી, વિવેકાનંદ એજ્યુકેશન કોલેજ, અમદાવાદ	હાજર
૫. આચાર્યશ્રી, આર. બી. સાગર કોલેજ ઑફ એજ્યુકેશન, અમદાવાદ	ગેરહાજર
૬. આચાર્યશ્રી, વૈદ્યશ્રી એમ. એમ. પટેલ એજ્યુકેશન કોલેજ, અમદાવાદ	હાજર
૭. આચાર્યશ્રી, શ્રીમતી એમ. એન. કે. દલાલ એજ્યુકેશન કોલેજ, અમદાવાદ	હાજર
૮. આચાર્યશ્રી, આર. પી. અનડા એજ્યુકેશન કોલેજ, બોરસદ	ગેરહાજર
૯. આચાર્યશ્રી, શેઠ એમ. એન. સી. કોલેજ ઑફ એજ્યુકેશન, ડભોઈ	હાજર
૧૦. આચાર્યશ્રી, સાર્વજનિક એજ્યુકેશન કોલેજ, ગોધરા	હાજર
૧૧. આચાર્યશ્રી, એસ. ટી. ટી. કોલેજ, ખેડા	હાજર
૧૨. આચાર્યશ્રી, બી. સી. જે. એજ્યુકેશન કોલેજ, ખંભાત	હાજર
૧૩. આચાર્યશ્રી, એસ. ડી. શેઠિયા એજ્યુકેશન કોલેજ, મુન્દ્રા	ગેરહાજર
૧૪. આચાર્યશ્રી, કોલેજ ઑફ એજ્યુકેશન, પેટલાદ	હાજર
૧૫. આચાર્યશ્રી, એમ. એન. શુક્લ એજ્યુકેશન કોલેજ, અમદાવાદ	હાજર

સભાનું પ્રમુખસ્થાન બી.એડ. ફેકલ્ટીના ડીન આચાર્યશ્રી બી. એમ. મોદીએ સંભાળ્યું હતું. સદરહુ સભામાં બી.એડ. પ્રવેશ માટે તથા પ્રવેશ અરજીપત્રકમાં નીચે મુજબ સુધારાવધારા કરવા માટે ઠરાવવામાં આવ્યું :

૧. એલિજિબિલિટી સર્ટિફિકેટ માટેનું ફાર્મ તથા રજિસ્ટ્રેશન ફાર્મ નિયત પ્રવેશ ફોર્મની સાથે જ જરૂરી નોંધ સાથે છપાવવાનું રાખવું. બી.એડ. પ્રવેશ અરજીપત્રકની કિંમત રૂ. ૪૦ રાખવી.

એલિજિબિલિટી સર્ટિફિકેટ અને રજિસ્ટ્રેશન ફાર્મ તથા પ્રવેશ ફોર્મના કાગળ સારી જાતના રાખવા જેથી તેની લાંબા સમય સુધી સાચવણી થઈ શકે અને શક્ય હોય તો બી.એડ. પ્રવેશ ફાર્મ કોમ્પ્યુટરરાઇઝ્ડ કરીને છપાવવાની પદ્ધતિ રાખવી.

૨. કોલેજમાં પ્રવેશ મેળવતી વખતે યુનિવર્સિટી રજિસ્ટ્રેશન ફી રૂ. ૧૦૦ લેવાની રાખવી અને યુનિવર્સિટી રજિસ્ટ્રેશન ફી માટે નીચે મુજબ ઑર્ડિ. મંજૂર કરવા એકેડેમિક અને એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવામાં આવે છે :

કોલેજ લીધેલી યુનિવર્સિટી રજિસ્ટ્રેશન ફી પ્રવેશ બાદ ૧ માસમાં જમા કરાવવાની રહેશે અને તે અંગે યુનિવર્સિટી પરીક્ષા ફોર્મમાં ફેરફારની જરૂર પડે તો તે ફેરફાર કરવા

Ordinance Edu. 1 (A) :

A Candidate pursuing B Ed Course will be required to registre himself and pay a fee of Rs 100 in prescribed form for this purpose

૩. સને ૧૯૯૭-૯૮ના શૈક્ષણિક વર્ષ માટે બી.એડ. પ્રવેશસમિતિની રચના કરવાની સત્તા ડીનશ્રીને આપવામાં આવી

ત્યાર બાદ સભાનું કામકાજ પૂરું થયું હતું.

એમ. ડી. સ્વામિનારાયણ
ક. રજિસ્ટ્રાર

પરિશિષ્ટ '૨૫/૧'

કામકાજ ક્રમાંક ૨ (૨૭) ૧

સેન્ટ ઝેવિયર્સ કૉલેજ, અમદાવાદમાં બી.એસસી. (સ્પે.)માં ઇલેક્ટ્રોનિક્સના વિષય શીખવવા માટેનો હેવાલ

[illegible] યુનિવર્સિટીના પત્રાંક-એકેડેમિક [illegible]-૧૯૯૬ તા. ૫-૧૨-૧૯૯૬ના સંદર્ભમાં અમે તારીખ [illegible] સેંટ ઝેવિયર્સ કૉલેજની મુલાકાત લીધી હતી. ટી.વાય. બી.એસસી. (ઇલેક્ટ્રોનિક્સ) [illegible] વિદ્યાર્થીઓને શિક્ષણ આપવા માટે સદરહુ કૉલેજમાં પૂરતા પ્રમાણમાં સ્ટાફ, પૂરતા પ્રમાણમાં [illegible] અને સાધનો હોવાનું અમે નોંધ્યું છે. વળી સદરહુ વિષયનાં પુસ્તકો પણ કૉલેજના ગ્રંથાલયમાં [illegible] માફક પડ્યું હતું. હાલમાં પણ કામચલાઉ ધોરણે આ કૉલેજમાં ટી.વાય.બી.એસસી. [illegible] ઇલેક્ટ્રોનિક્સમાં શિક્ષણ આપવામાં આવી રહ્યું છે અને છેલ્લાં ૫ વર્ષમાં કૉલેજના આ [illegible] પરિણામ પણ ઘણાં જ સંતોષકારક જણાયાં છે. આ બધી બાબતોને ધ્યાનમાં લેતાં [illegible] સમિતિ સર્વાનુમતે સેંટ ઝેવિયર્સ કૉલેજને ટી.વાય. બી.એસસી. કક્ષાએ ઇલેક્ટ્રોનિક્સ વિષયમાં ૨૦ [illegible] શિક્ષણ આપવા માટે કાયમી જોડાણ આપવા ભલામણ કરીએ છીએ.

ડાં. વી. બી. ગોહિલ
પ્રિ. સી. બી. ગેમાવત
પ્રિ. વાડીભાઈ પટેલ.

અૅકેડેમિક કાઉન્સિલની ભલામણ

[illegible] આવે છે કે સેંટ ઝેવિયર્સ કૉલેજ, અમદાવાદ નિમણૂકો અંગેની શરત સહિતની નીચે [illegible] એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૨૮-૨-૧૯૯૭ સુધીમાં કરે તો તેને [illegible] વિષયના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી કાયમી જોડાણ આપવા [illegible]

[illegible] અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલ [illegible] આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો [illegible] પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

[illegible] સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ [illegible]

[illegible] યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, [illegible] પ્રૉવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલા [illegible] તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કોઈ લેણું ચૂકવવાનું બાકી નથી તેવું [illegible] આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ [illegible] લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત [illegible] કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું [illegible] આવે

[illegible] સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના [illegible] નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી [illegible] સામાજિક અને શૈક્ષણિક રીતે પછાત જાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત [illegible] યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-આવશે."

પરિશિષ્ટ "૨૫/૨"

કામકાજ ક્રમાંક ૨ (૨૭) (૨)

"જે. એલ. કે. આર્ટ્સ ઍન્ડ કૉમર્સ કૉલેજ, કાંકણપુરનો સ્થાનિક તપાસસમિતિનો હેવાલ"

તા. ૧૮-૨-૧૯૯૭ના રોજ અમે ઉપરોક્ત સંસ્થાની રૂબરૂ મુલાકાત લીધી હતી. સંસ્થાના સંચાલક શ્રી ભરતભાઈ શાહ તથા કૉલેજના આચાર્યશ્રી પાસેથી જરૂરી માહિતી મેળવી હતી. આ ઉપરાંત કૉલેજના અધ્યાપકોના પ્રતિભાવ પણ મેળવ્યા હતા અને કૉલેજ-લાઇબ્રેરીની મુલાકાત લીધી હતી. કૉલેજ પાસે પોતાની માલિકીનું યોગ્ય સગવડવાળું મકાન ઉપલબ્ધ છે.

જૂન, ૧૯૯૪થી જે શરતોને આધીન કૉલેજને યુનિવર્સિટી સાથે સંસ્થાને જોડાણ આપવામાં આવ્યું હતું, તે શરતોનું પાલન નીચેની બાબતોમાં થયેલ જણાય છે :

૧. કાર્યભારને અનુલક્ષીને જરૂરી અધ્યાપકવર્ગ તથા ગ્રંથપાલ સહિતની નિમણૂક.
૨. કાર્યાલયમાં ત્રીજા તથા ચોથા વર્ગના કર્મચારીગણની નિમણૂક.
૩. બિનશિક્ષક કર્મચારીઓને બૅંક ઍડવાન્સ દ્વારા ચૂકવણી.

કૉલેજની લાઇબ્રેરીમાં જે તે વિષયના સંદર્ભમાં રેફરન્સ પુસ્તકો ખરીદવા માટે તથા વિષયને લગતાં મૅગેઝિનો મંગાવવા માટે કૉલેજના આચાર્યશ્રીએ ખાતરી આપેલ છે.

આ સંજોગોમાં યુનિવર્સિટી સાથેના કૉલેજના જોડાણ માટેની અરજી મંજૂર રાખવા તથા તેને વર્ષ, ૧૯૯૭ માટે જોડાણ આપવા ભલામણ કરીએ છીએ.

ડૉ. રઘુવીર ચૌધરી
ડૉ. ભૈરવ દેસાઈ
પ્રા. સી. એચ. ઠાકર.

અૅકેડેમિક કાઉન્સિલની ભલામણ

"આથી ઠરાવવામાં આવે છે કે શ્રી જે. એલ. કે. આર્ટ્સ ઍન્ડ કૉમર્સ કૉલેજ, કાંકણપુર, નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૧૫-૪-૧૯૯૭ સુધીમાં કરે તો તેને બી.એ. (પ્રિન્સિ.)માં ગુજરાતી, હિન્દી, સંસ્કૃત, સમાજશાસ્ત્ર; બી.એ. (ગૌણ)માં ઇતિહાસ, મનોવિજ્ઞાન, અંગ્રેજી, અર્થશાસ્ત્ર; બી.કૉમ. (મુખ્ય)માં ઍડ. એકા. ઍન્ડ ઑડિટિંગ; બી.કૉમ. (ગૌણ)માં ઍડ. સ્ટૅટિસ્ટિક્સના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૮ સુધીનું ચાલુ જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. ઑ. ૧૨૦-એ-અનુસાર કાર્યભારના સંદર્ભમાં જરૂરી શિક્ષકગણની નિમણૂકો કરવામાં આવે. મહેકમના સંદર્ભમાં બિનશિક્ષકવર્ગના કર્મચારીની નિમણૂકો કરવામાં આવે;

૨. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચનો આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

[illegible] પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;

૪. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રૉવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલા શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કોઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ [illegible] સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

[illegible] ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીઓની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત [illegible] યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણનો [illegible] કરવામાં આવે છે [illegible]

પરિશિષ્ટ "૨૫/૩"

કામકાજ ક્રમાંક ૨ (૨૭) (૩)

એમ. એમ. ગાંધી આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, કાલોલનો સ્થાનિક તપાસસમિતિનો હેવાલ

ગુજરાત યુનિવર્સિટીની સ્થાનિક સમિતિ દ્વારા એમ. એમ. ગાંધી આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, કાલોલ, પંચમહાલના કાયમી જોડાણના સંદર્ભમાં એક તપાસ કરવામાં આવી હતી. સમિતિના સભ્યોએ તા. ૩૦-૧-૧૯ શુક્રવારના રોજ રૂબરૂ જઈને આ અંગેની માહિતી પ્રાપ્ત કરી હતી અને તેનો હેવાલ અત્રે રજૂ કરીએ છીએ.

(૧) સામાન્ય માહિતી :

આ કૉલેજની શરૂઆત તા. ૭-૭-૧૯૯૦થી થઈ હતી. યુનિવર્સિટીએ તા. ૧૪-૬-૧૯૯૭ સુધી આ કૉલેજના જોડાણની મંજૂરી આપેલ છે. હવે કાયમી જોડાણ માટેની અરજી મળવાથી તે અંગે જાતતપાસ કરી જોડાણની મંજૂરી મેળવવા માટે કૉલેજની માગણી છે.

હાલ આર્ટ્સ એન્ડ કૉમર્સ એમ બંને કૉલેજમાં તમામ વર્ગો એફ.વાય. બી.એ.થી ટી.વાય. બી.એ. તેમ એફ. વાય. બી.કૉમ.થી ટી.વાય. બી.કૉમ. સુધી ચાલે છે. વર્ગો અને તે માટેના વિષયોની માહિતી પરિશિષ્ટ દર્શાવ્યા પ્રમાણેની છે :

કૉલેજના મકાન તેમ જ વિશાળ કમ્પાઉન્ડ વગેરેની સુંદર વ્યવસ્થા છે. જે બંને કૉલેજો માટે યોગ્ય છે. દરેક વર્ગ માટે પણ અભ્યાસ માટેની પૂરતી સગવડવાળો છે. લગભગ ગ્રામ્ય વિસ્તારની આ કૉલેજોના વિદ્યાર્થીઓ માટેની પૂરતી અનુકૂળતાઓ છે. વર્ગો, અભ્યાસક્રમો, પુસ્તકાલય, શૈક્ષણિક અને બિનશૈક્ષણિક સ્ટાફ વગેરે માટેની માહિતી પરિશિષ્ટમાં દર્શાવેલી છે. યુનિવર્સિટીનાં ધારાધોરણ અનુસાર જરૂરી કાર્યવિધિ સંસ્થાએ કરેલી છે અને તે માટેની વિગતો યુનિવર્સિટીને તેમ જ સંસ્થાના સભ્યોને પણ દર્શાવેલી છે. ઉપરોક્ત માહિતીની જાતતપાસ કરતી વખતે રૂબરૂ મુલાકાત સમયે નીચે પ્રમાણેની વિગતો પ્રાપ્ત કરાઈ છે :

(૨) દર્શાવેલી તમામ માહિતીની ચકાસણી માટે યુનિવર્સિટી દ્વારા નીમવામાં આવેલી આ સમિતિએ જુદા જુદા પાસાઓનો અભ્યાસ કર્યો હતો. આ મુલાકાત સમયે કૉલેજના આચાર્યશ્રી, ટ્રસ્ટના મંત્રીશ્રી તથા પ્રમુખશ્રી હાજર રહ્યા હતા. તેમની સાથે વિચારવિમર્શ કરવામાં આવ્યો હતો. તેમણે રજૂ કરેલ કેટલાક મુદ્દાઓ નીચે પ્રમાણે છે :

૧. જો કાયમી જોડાણ આપવામાં આવે તો કૉલેજો ગ્રાન્ટને પાત્ર બને, સંસ્થા પરનું ભારણ ઘટે અને કૉલેજોનો સારો વિકાસ થઈ શકે.

૨. કૉલેજો દ્વારા ટેસ્ટ પરીક્ષાના તેમ જ યુનિવર્સિટી પરીક્ષાઓ સમયસર અને વ્યવસ્થિત રીતે લેવામાં આવે છે, આ માટે કોઈ મુશ્કેલી નથી.

૩. વર્ષના અંતે વિદ્યાર્થીઓ પાસેથી અધ્યાપકગણ માટેની એક અભિપ્રાય મોજણી કરવામાં આવે છે. તેમાં એક અને અનેક પાસાઓને વિસ્તૃત રીતે આવરી લેવામાં આવે છે અને તેની તપાસ નિરપેક્ષ રીતે કરાય છે. આ એક પ્રશંસનીય બાબત છે.

૪. વિદ્યાર્થીઓ અને અધ્યાપકો તેમ જ બિનશૈક્ષણિક કર્મચારીઓ મોટે ભાગે નજીકનાં સ્થળોએથી આવતા હોવાથી અધ્યાપકો માટે અલગ નિવસસ્થાન તેમ જ વિદ્યાર્થીઓ માટે હૉસ્ટેલની જરૂર પડતી નથી.

૫. સમિતિના સભ્યોએ બે મુખ્ય મુદ્દા પર ભાર મૂક્યો હતો જેની વિગતો નીચે પ્રમાણે છે :

(અ) શૈક્ષણિક સ્ટાફના સભ્યો સાથે વાર્તાલાપ ખાનગી રીતે યોજવામાં આવ્યો હતો અને તેમની પાસેથી વિગતો માગી હતી. પગાર, પ્રૉવિડન્ટ ફંડ વગેરે માટે કોઈ પણ અધ્યાપકને કશી જ મુશ્કેલી પડતી નથી, તેવું સ્પષ્ટ નિદાન મળ્યું હતું. શૈક્ષણિક સ્ટાફને અન્ય કોઈ અગવડ નથી તેવું જાણવા મળ્યું છે.

(બ) પુસ્તકાલયની વિગતવાર તપાસ કરવામાં આવી હતી. તેના અંતે જાણવા મળ્યું છે કે પુસ્તકો પૂરતી સંખ્યામાં છે. યુનિવર્સિટી અને સમિતિએ પાઠવેલી વિગતો પ્રમાણેનાં પુસ્તકોની સંખ્યા મહદંશે પૂરતા પ્રમાણમાં છે.

ઉપરની માહિતીને આધારે સમિતિના સભ્યો વિચારવિમર્શ કરીને નીચેનાં અવલોકનો રજૂ કરે છે :

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(૩) (અ) શૈક્ષણિક સ્ટાફ પૂરતી સંખ્યામાં નથી, તેથી તેની ભરતી કરવા માટેનો નિર્ણય સત્વરે લઈને તે અંગેની તમામ જરૂરી વ્યવસ્થા કરવી જોઈએ. આ અંગે સંસ્થાએ પણ જણાવેલ છે કે આવી ભરતી તેઓ તુરત જ કરશે. પૂરતા સ્ટાફ વગર સંસ્થાઓ સારી રીતે ચાલે તે અશક્ય છે. સમિતિ આ મુદ્દાને સૌથી મહત્ત્વનો ગણે છે અને યુનિવર્સિટી આ માટે વિશેષ ભાર મૂકશે તેવી અપેક્ષા છે.

(બ) બિનશૈક્ષણિક સ્ટાફ પર્યાપ્ત સંખ્યામાં છે, પરંતુ હેડક્લાર્કની નિમણૂક જરૂરી છે.

(ક) પુસ્તકાલયની વ્યવસ્થા છે, પણ તે પર્યાપ્ત નથી. વિશેષ જર્નલો, પ્રકાશનો, પુસ્તિકાઓ, મેળવવાં જોઈએ. વિષયવાર પુસ્તકોની ફાળવણી દર્શાવાઈ છે, પરંતુ વધુ પુસ્તકો અને ખાસ કરીને તો અર્થશાસ્ત્ર, એકાઉન્ટન્સ, આંકડાશાસ્ત્ર જેવા વિષયોમાં પ્રાપ્ત એવાં આધુનિક પાઠ્યપુસ્તકોની ઘણી જરૂરિયાત છે. આંકડાશાસ્ત્રમાં મોટે ભાગે માત્ર ગુજરાતી પુસ્તકો છે અને તે પણ મર્યાદિત છે. તેમાં વિશેષ ઉમેરો કરવાની જરૂર છે. આ વગર કોઈ પણ સંસ્થા આગળ આવી જ ના શકે. યુનિવર્સિટી જેવી સંસ્થા માટે કાયમી જોડાણ કરવાની માગણી છે ત્યારે આ મુદ્દા પર પણ આ સમિતિએ વિશેષ ભાર મૂક્યો.

(૪) ભવિષ્યમાં કૉમ્પ્યુટરના અભ્યાસ અંગેની સગવડ ઊભી થાય તો વિદ્યાર્થીઓ અને અધ્યાપકો માટે વધુ સારુ બની શકે.

(૫) હાલ સ્ટાફ માટે કે વિદ્યાર્થીઓ માટે રહેઠાણની વ્યવસ્થા નથી. ભવિષ્યમાં આયોજનની દૃષ્ટિએ આ માટે વિચારણા કરી શકાય.

(૪) અંતિમ તારણ :

ઉપર દર્શાવેલા સમગ્ર મુદ્દાઓને આવરી લઈને આ સમિતિ એવા અંતિમ નિષ્કર્ષ પર આવે છે કે આ બંને કૉલેજોએ કાયમી જોડાણ માટેની જે અરજી કરેલી છે તેને માન્ય રાખવી જોઈએ અને આ સંસ્થાઓને કાયમી જોડાણ આપવું જોઈએ. આવું જોડાણ આપતી વખતે ઉપરનાં અવલોકનોના બે મહત્ત્વના મુદ્દાઓ સ્ટાફની ભરતી તેમ જ પુસ્તકાલયની પૂરતી વ્યવસ્થા કરવા માટે વિશેષ પર્યાપ્ત સગવડો ઊભી કરીને આપવામાં આવશે તો એક સારા ટ્રસ્ટ દ્વારા ઊભી થયેલી આ બેઉ સંસ્થાઓ પૂરતો વિકાસ સાધી શકશે અને આ ગ્રામ્ય વિસ્તારની જરૂરિયાતોને સંતોષી શકશે.

ડૉ. બી. એચ. દેસાઈ
ડૉ. બી. બી. જાની
ડૉ. સી. એચ. ઠાકર.

એકેડેમિક કાઉન્સિલની ભલામણ

"આથી ઠરાવવામાં આવે છે કે એમ. એમ. ગાંધી આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, કાલોલ નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૧૫-૪-૧૯૯૭ સુધીમાં કરે તો તેને બી.એ. (પ્રિન્સિ.)માં ગુજરાતી, સંસ્કૃત, સમાજશાસ્ત્ર; બી.એ. (ગૌણ)માં મનોવિજ્ઞાન, અર્થશાસ્ત્ર; બી.કૉમ. (મુખ્ય)માં ઍડ. ઍકાઉન્ટ ઍન્ડ ઑડિટિંગ; બી.કૉમ. (ગૌણ)માં આંકડાશાસ્ત્ર, એસ.પી.ના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી કાયમી જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. ઑ. ૧૨૦-એ-અનુસાર કાર્યભારના સંદર્ભમાં જરૂરી શિક્ષકગણની નિમણૂક કરવામાં આવે, બિનશિક્ષકવર્ગના કર્મચારીગણમાં હેડક્લાર્કની નિમણૂક કરવામાં આવે;

૨. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચનો આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

૩. પુસ્તકાલયમાં વિશેષ જર્નલો, પ્રકાશનો, પુસ્તિકાઓ વસાવવામાં આવે. ખાસ કરીને અર્થશાસ્ત્ર, એકાઉન્ટ, આંકડાશાસ્ત્ર વિષયનાં વધુ પુસ્તકો વસાવવામાં આવે;

૪. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;

૫. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રૉવિડન્ટ ફંડ, ગ્રૅચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલા શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૬. કર્મચારીગણ અને વિદ્યાર્થીઓ માટે રહેઠાણની યોગ્ય વ્યવસ્થા કરવામાં આવે;

૭. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવાનાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-અવશ્ય."

પરિશિષ્ટ "૨૫/૪"

કામકાજ ક્રમાંક ૨ (૨૭) (૪)

શ્રી મહેમદાવાદ એજ્યુકેશન સોસાયટીની મહેમદાવાદ ખાતે સૂચિત આર્ટ્સ, કૉમર્સ કૉલેજનો હેવાલ

ભાગ-૧

ગુજરાત યુનિવર્સિટીના પત્રાંક : ઍકેડેમિક/૧૨૩૫-૪૦ તા. ૨૫-૪-૧૯૯૭ અન્વયે મહેમદાવાદ ખાતે સદરહુ સંસ્થાની મુલાકાત અમે તા. ૨૯-૪-૧૯૯૭ના રોજ નીચે અને સ્થાનિક તપાસસમિતિના સભ્યો તરીકે લીધી હતી. મુલાકાત સમયે સંસ્થાના પ્રમુખ, જનરલ સેક્રેટરી અને સંચાલક મંડળના અન્ય આગેવાનો હાજર રહ્યા હતા. અને અમને જરૂરી વિગતો અને માહિતી પૂરી પાડી હતી.

આ અગાઉ ગુજરાત યુનિવર્સિટીએ મહેમદાવાદ ખાતે વિનયન અને વાણિજ્ય કૉલેજની જરૂરિયાત સ્વીકારી ન હતી. સદરહુ સંસ્થાની અપીલના સંદર્ભમાં ગુજરાત સરકારે જૂન, ૧૯૯૭થી કૉલેજ શરૂ કરવા માટે સૈદ્ધાંતિક પૂર્વમંજૂરી આપેલ, જેના અનુસંધાનમાં સંસ્થાની મુલાકાત અમે લીધી હતી.

આ સંદર્ભમાં નીચેની શરતોએ સદરહુ કૉલેજને એક વર્ષ (૧૯૯૭-૯૮)ના શૈક્ષણિક વર્ષ માટે જોડાણ આપવા માટે ભલામણ કરીએ છીએ :

(૧) ગુજરાત યુનિવર્સિટીના રજિસ્ટ્રારના નામે રૂ. ૨૩,૦૦,૦૦૦ (ત્રેવીસ લાખ)ની ડિપૉઝિટ મુકવા માટેની રકમ યુનિવર્સિટીમાં ભરવામાં આવે. આ રકમ તા. ૧૩-૫-૧૯૯૭ સુધીમાં ભરવાની રહેશે.

(૨) અન્ય શરતો જેનું પરિપાલન સંસ્થાએ તા. ૩૧-૫-૧૯૯૭ સુધીમાં કરવાનું રહેશે.

૧. ગ્રંથાલયમાં વિનયન માટે રૂ. ૨૦,૦૦૦નાં અને વાણિજ્ય માટે રૂ. ૧૦,૦૦૦નાં પુસ્તકો વસાવવામાં આવે;

૨. વર્ગ ખંડો પર્યાપ્ત સ્વરૂપમાં ઉપલબ્ધ છે પરંતુ તેમાં જરૂરી પાટલીઓ, ખુરશીઓ, ટેબલ, બ્લેકબોર્ડ, લાઈટ, પંખા, વગેરેની પૂરતી સુવિધા કરવામાં આવે;

૩. અપેક્ષિત કાર્યભાર જોતાં નીચે જણાવ્યા મુજબના જુદા જુદા વિષયો માટેના અધ્યાપકોની નિમણૂક કરવામાં આવે અને ગ્રંથપાલ તથા શારિરીક શિક્ષણના ડાયરેક્ટરની નિમણૂક કરવામાં આવે;

(અ) અંગ્રેજીના પૂર્ણ સમયના એક વ્યાખ્યાતા

(બ) ગુજરાતીના ખંડ સમયના એક વ્યાખ્યાતા

(ક) અર્થશાસ્ત્રના પૂર્ણ સમયના એક વ્યાખ્યાતા

(ડ) સંસ્કૃતના પૂર્ણ સમયના એક વ્યાખ્યાતા

(ઇ) સમાજશાસ્ત્રના પૂર્ણ સમયના એક વ્યાખ્યાતા

(ફ) એકાઉન્ટન્સી/કૉમર્સના પૂર્ણ સમયના એક વ્યાખ્યાતા

(ગ) આંકડાશાસ્ત્રના ખંડ સમયના એક વ્યાખ્યાતા

(હ) એક ગ્રંથપાલ

(ઇ) શારીરિક શિક્ષણના ડાયરેક્ટર.

૪. બિનશૈક્ષણિક કર્મચારીઓની નીચે મુજબની નિમણૂકો કરવામાં આવે :

(અ) સિનિયર ક્લાર્ક-એક

(બ) જુનિયર ક્લાર્ક-બે

(ક) પટાવાળા, સફાઈ કામદાર, ચોકીદાર : કુલ પાંચની નિમણૂક કરવાની થાય.

૫. આચાર્યની નિમણૂક કરવામાં આવે. આચાર્ય જે વિષયના અધ્યાપક હોય તે વિષયમાં અન્ય અધ્યાપકની નિમણૂક કાર્યભારને આધારે કરવાની રહેશે.

(૩) સંસ્થાએ યુનિવર્સિટીનાં ધારાધોરણોનું પણ પાલન કરવાનું રહેશે.

(૪) નવી કૉલેજો માટે યુનિવર્સિટીએ નક્કી કરેલ અન્ય વધારાની શરતોનું પાલન પણ આ સંસ્થાએ કરવાનું રહેશે.

ભાગ-૨

યુનિવર્સિટીએ ગુજરાત સરકારને કાર્યવાહી કરવા માટે લખવાની બાબત

ખેડા ખાતેની ખેડા આર્ટ્સ, કૉમર્સ કૉલેજમાં ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષ દરમિયાન પ્રથમ વર્ષ બી.એ.માં માત્ર ૮૩ અને પ્રથમ વર્ષ બી.કૉમ.માં માત્ર ૨૪ વિદ્યાર્થીઓ હતા. આ સંદર્ભમાં જૂન, ૧૯૯૭થી મહેમદાવાદ ખાતે નવી કૉલેજ શરૂ થતાં અને આ બંને કૉલેજો વચ્ચેનું અંતર ૧૨ કિલોમીટર હોવાને કારણે ખેડા આર્ટ્સ, કૉમર્સ કૉલેજની વિદ્યાર્થી સંખ્યા ઉપર વિપરીત અસર ચોક્કસ થશે જ. આવી વિપરીત અસરને કારણે ખેડા આર્ટ્સ, કૉમર્સ કૉલેજની વિદ્યાર્થી સંખ્યા [illegible] તે સંસ્થા Viable પણ રહે તે સંજોગોમાં તેની ગ્રાન્ટ કપાવી જોઈએ નહીં અને શૈક્ષણિક તેમ જ બિનશૈક્ષણિક કર્મચારીઓ પર પણ તેની વિપરીત અસર પડવી જોઈએ નહીં અને રાજ્ય સરકારે આવી વિપરીત અસર ન પડે તે માટે કાર્યવાહી કરવી.

પ્રો. કે. એસ. શાસ્ત્રી

પ્રિ. દર્શનસીંગ શીખ

પ્રો. વાય. કે. અગ્રવાલ

પ્રો. આર. એચ. વ્યાસ

પ્રિ. એચ. એમ. દેસાઈ.

ઍકેડેમિક કાઉન્સિલની ભલામણ

"આથી ઠરાવવામાં આવે છે કે શ્રી મહેમદાવાદ એજ્યુકેશન સોસાયટી, મહેમદાવાદ તરફથી શિક્ષકગણની નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પરિપાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૩૧-૫-૧૯૯૭ સુધીમાં અને શરત ક્રમાંક-૧૩નું પરિપાલન તા. ૧૩-૫-૧૯૯૭ સુધીમાં કરે તો તેને મહેમદાવાદ ખાતે પ્રથમ વર્ષ વિનયન અને પ્રથમ વર્ષ વાણિજ્યમાં એક એક વર્ગનું તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬- ૧૯૯૮ સુધીમાં નવું જોડાણ આપવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

૧. નીચે મુજબ શિક્ષક-બિનશિક્ષક કર્મચારીઓની નિમણૂક કરવામાં આવે :

ક્રમ શિક્ષક કર્મચારીઓ	*સંખ્યા*
૧. આચાર્ય	૧
૨. અંગ્રેજીના પૂર્ણ સમયના વ્યાખ્યાતા	૧
૩. ગુજરાતીના ખંડ સમયના વ્યાખ્યાતા	૧
૪. અર્થશાસ્ત્રના પૂર્ણ સમયના વ્યાખ્યાતા	૧
૫. સંસ્કૃતના પૂર્ણ સમયના વ્યાખ્યાતા	૧
૬. સમાજશાસ્ત્રના પૂર્ણ સમયના વ્યાખ્યાતા	૧
૭. કૉમર્સ-એકાઉન્ટના પૂર્ણ સમયના વ્યાખ્યાતા	૧-૧
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પટાવાળા, સફાઈ કામદાર, વોચમેન વગેરે	૫

આચાર્ય જે વિષયના અધ્યાપક હોય તે વિષયમાં અન્ય અધ્યાપકની નિમણૂક કાર્યભારને આધારે કરવાની રહેશે.

૨. કૉલેજના મકાનમાં ઓછામાં ઓછી નીચે પ્રમાણેની જગ્યાઓ યુનિવર્સિટીનાં પ્રચલિત ધારાધોરણ પ્રમાણે કરવામાં આવે :

૧. વિદ્યાર્થીદીઠ ૮ ચો. ફૂટ લેખે જરૂરી સંખ્યામાં શૈક્ષણિક દષ્ટિએ યોગ્ય તેવા અભ્યાસખંડો,

૨. વર્ગ-ખંડ અને ટ્યુટોરિયલ માટે ખંડમાં જરૂરી ખંડો;

૩. શિક્ષક માટેનો ખંડ-એટેચ્ડ ટોયલેટની વ્યવસ્થા સાથે;

૪. અભ્યાસ ખંડોમાં જરૂરી પાટલીઓ, ખુરશી, ટેબલ, બ્લેકબોર્ડ, લાઈટ, પંખાની પર્યાપ્ત સુવિધા ઉપલબ્ધ કરવામાં આવે;

૫. કૉલેજના કુલ વિદ્યાર્થીઓની સંખ્યાના ઓછામાં ઓછા ૧૦ ટકા જેટલા વિદ્યાર્થીઓ બેસી શકે તેવા ખંડ,

૬. વિદ્યાર્થિનીઓની સંખ્યાના ઓછામાં ઓછા ૧૦ ટકા વિદ્યાર્થિનીઓ માટેના ખંડ (શૌચાલય વગેરે સુવિધા સહિતનો);

૭. પ્રત્યેક વિદ્યાશાખાના ઓછામાં ઓછા ૧૦ ટકા વિદ્યાર્થીઓ એકસાથે બેસીને વાંચી શકે તેટલી સગવડવાળો સુસજ્જ વાચન ખંડ સહિત ગ્રંથાલય;

૮. આચાર્ય માટેનો ખંડ—એટેચ્ડ ટોયલેટની વ્યવસ્થા સાથે;

૯. કૉલેજના [illegible] માટેનો ખંડ;

૧૦. [illegible] માટેના ખંડ;

૧૧. શૌચાલય [illegible]ની યોગ્ય વ્યવસ્થા;

૩. ઓછામાં ઓછા પચ્ચીસ વિદ્યાર્થીઓ રહી શકે તેવા છાત્રાલયની જોગવાઈ કરવામાં આવે તથા ગૃહપતિ માટે ભાડામુક્ત રહેઠાણની યોગ્ય વ્યવસ્થા કરવામાં આવે;

૪. ગ્રંથાલય માટે વિદ્યાશાખાદીઠ આવર્તક ખર્ચ નીચે મુજબ કરવામાં આવે :

૧. પુસ્તક માટે રૂ. ૧૦,૦૦૦
૨. સામયિકો માટે રૂ. ૧,૨૫૦
૩. સંદર્ભગ્રંથો રૂ. ૧,૨૫૦

૫. ઓછામાં ઓછા ૧૦,૦૦૦ ચોરસવાર જેટલા ક્ષેત્રફળના રમતગમતના મેદાનની જોગવાઈ કરવામાં આ જે પૈકી કૉલેજના મુખ્ય મકાનની બની શકે તેટલી નજીકમાં ઓછામાં ઓછી ૧૦૦૦ ચો. વાર જેટ જગ્યા હોવી આવશ્યક ગણાશે;

૬. યુનિવર્સિટીના ધારાધોરણ મુજબ આચાર્ય માટે કૉલેજ નજીક ભાડામુક્ત રહેઠાણની વ્યવસ્થા કરવામાં આ

૭. આચાર્યને હોદ્દાની રૂએ વ્યવસ્થાપક સમિતિના સભ્ય બનાવવામાં આવે;

૮. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકોને પગારધોરણ, મોંઘવારી ભથ્થું, ઘરભાડા ભથ્થું તથા પ્રોવિડ ફંડનો લાભ આપવામાં આવે તથા શિક્ષકોના વાર્ષિક મૂળ પગારના ૨.૫ (અઢી) ટકાના દરે ગ્રેચ્યુઇટી ફં જમું કરવામાં આવે;

૯. કૉલેજના સંચાલનમાં જે ખાધ થાય તે પૂરી કરવાની સંચાલક મંડળ તરફથી બાંયધરી આપવામાં આ

૧૦. "ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી પ્રવેશ શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીઓની નિમણૂક, ભરતી, બઢતી, ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયે સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામ જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવશે" મુજબનું સંસ્થાનું બાંહેધરીપત્ર આપવાનું રહેશે;

૧૧. આ યુનિવર્સિટીની સ્થાનિક તપાસસમિતિ સાથે અરજીકર્તા મંડળના હોદ્દેદાર સાથે થયેલી સ્પષ્ટતા અન્વ (૧) આચાર્યશ્રી, (૨) શૈક્ષણિક તથા (૩) બિનશિક્ષકવર્ગના કર્મચારીઓની નિમણૂક માટેનો ઓપન ઇન્ટરવ્યૂ યુનિવર્સિટી કાર્યાલયમાં રાખવામાં આવે;

૧૨. યુનિવર્સિટીના નિયમાનુસારની વરણીસમિતિ ઉપરાંતના સભ્યો વરણીસમિતિ ઉપર કુલપતિશ્રી નિયુક્ત કરશે, કુલપતિશ્રી દ્વારા નિયુક્ત આવા સભ્યોનાં નામ સંસ્થાએ યુનિવર્સિટી પાસેથી મેળવી લેવાનાં રહેશે;

૧૩. ગુજરાત યુનિવર્સિટીના રજિસ્ટ્રારના નામે રૂ. ૨૩ લાખ (ત્રેવીસ લાખ)ની ડિપૉઝિટ મૂકવા માટેની રકમ યુનિવર્સિટીમાં જમા કરવામાં આવે, આ રકમ તા. ૧૩-૫-૧૯૯૭ સુધીમાં યુનિવર્સિટીમાં ભરવાની રહેશે. ત્યાર બાદ શરતોને આધિન જોડાણ આપવામાં આવશે. આ ડિપૉઝિટ સંસ્થા ગ્રાન્ટપાત્ર ન થાય ત્યાં સુધી યુનિવર્સિટી જમા રહેશે.

૧૪. જોડાણ આપ્યા બાદ કૉલેજ ગ્રાન્ટપાત્ર થાય તેટલા સમયગાળા દરમિયાન જો કૉલેજ તરફથી યુનિવર્સિટીએ નિયત કર્યા પ્રમાણે શિક્ષક-બિનશિક્ષક કર્મચારીની વર્ષના મોટા ભાગ દરમિયાન નિમણૂક કરવામાં આવશે નહીં, તો જ્યારે પણ સંસ્થા ગ્રાન્ટને પાત્ર થશે ત્યારે આવી નિમણૂકો નહીં કરીને બચત કરેલ રકમ જેટલી રકમ અનુદાનમાંથી કપાત કરવાની ભલામણ સરકારને યુનિવર્સિટી કરી શકશે.

પરિશિષ્ટ "૨૫/૫"

કામકાજ ક્રમાંક ૨ (૨૭) (૫)

આર્ટ્સ, કૉમર્સ અને સાયન્સ કૉલેજ, બોરસદમાં કૉમ્પ્યુટર મેથડ્સ, કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશન્સ, કૉમ્પ્યુટર પ્રોગ્રામિંગ વિષયનું કાયમી જોડાણ આપવા અંગે નિમાયેલ તપાસસમિતિનો હેવાલ

અમો સ્થાનિક તપાસસમિતિના સભ્યો તરીકે આર્ટ્સ, કૉમર્સ અને સાયન્સ કૉલેજ, બોરસદની તા. ૧૩-૧૨-૧૯૯૬ના રોજ મુલાકાત લીધી હતી. મુલાકાત દરમિયાન આચાર્યશ્રી એસ. પી. જોષીએ હાજર રહી માહિતી પૂરી પાડી હતી જે નીચે પ્રમાણે છે :

૧. કૉમ્પ્યુટરની પ્રયોગશાળામાં એક ૪૮૬ સરવર પ્રિન્ટર સાથે અને ત્રણ ૩૮૬ નોડની લાન સિસ્ટમ (Lan System) ગોઠવવામાં આવી છે. ઉપરાંત બે પીસી-એક્સટી અલાયદા પણ ગોઠવવામાં આવ્યા છે.

૨. આ પ્રયોગશાળાનો ઉપયોગ ત્રણે વિદ્યાશાખાના આ વિષયના વિદ્યાર્થીઓ કરે છે.

૩. ૧૯૯૬-૯૭ના વર્ષ દરમિયાન ફર્સ્ટ બી.કૉમ.માં ૨૬, સેકન્ડ બી.કૉમ.માં ૧૬, ફર્સ્ટ બી.એ.માં ૮, ફર્સ્ટ બી.એસસી.માં ૬ અને સેકન્ડ બી.એસસી.માં ૧ વિદ્યાર્થીઓને કૉમ્પ્યુટર સાયન્સના વિષયમાં પ્રવેશ આપવામાં આવ્યો છે.

૪. પ્રાયોગિક કાર્ય પ્રતિમશીન બે વિદ્યાર્થીઓની બેચ બનાવીને કરાવવામાં આવે છે.

૫. પૂર્ણ સમયના વ્યાખ્યાતા તરીકે શ્રી વિજયકુમાર ભોઈ અને પૂર્ણ સમયના પ્રોગ્રામર તરીકે કીર્તિકુમાર પ્રજાપતિ સેવાઓ આપે છે. તેમની નિમણૂક ધારાધોરણ પ્રમાણે જણાઈ છે.

૬. કૉમ્પ્યુટર સાયન્સ વિષયનાં આશરે ૬૦ જેટલાં પુસ્તકો વસાવવામાં આવ્યાં છે.

હાલની ત્રણેય વિદ્યાશાખાના વિદ્યાર્થીઓ માટે આ વિષયની ઉપલબ્ધ સવલતોને ધ્યાનમાં લઈ સમિતિ નીચેની શરતોએ આર્ટ્સ, કૉમર્સ અને સાયન્સ ત્રણેય વિદ્યાશાખા માટે કાયમી જોડા આપવા ભલામણ કરે છે :

૧. કૉમ્પ્યુટરની પ્રયોગશાળામાંનાં મશીનોને અપગ્રેડ કરાવી એક સરવર વત્તા પાંચ નોડની સવલત ઊભી કરવામાં આવે અને તેમાં પર્યાપ્ત મેમરી મૂકવામાં આવે જેથી વિન્ડોઝ સહિત અન્ય સૉફ્ટવેરનું નિદર્શન અભ્યાસક્રમની જરૂરિયાત પ્રમાણે થઈ શકે.

૨. કૉમ્પપુટર સાયન્સનાં પુસ્તકોપેટે રૂ. ૫,૦૦૦નો તાત્કાલિક ખર્ચ કરવામાં આવે અને પ્રતિવર્ષ રૂ. ૨,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે. આ વિષયનાં ચાર જેટલાં સામયિકો નિયમિત મંગાવવામાં આવે.

૩. ભવિષ્યમાં પ્રતિમશીન એક વિદ્યાર્થીની બેચ બનાવી પ્રાયોગિક કાર્ય કરાવવાનું લક્ષ રાખવામાં આવે.

૪. કૉમ્પ્યુટરના ફાજલ સમયનો ઉપયોગ ફક્ત આંતરિક વહીવટી તેમ જ શૈક્ષણિક કાર્ય માટે જ કરવામાં આવે.

ડાં. વાય. કે. અગ્રવાલ
શ્રી આર. પી. સોની
ડાં. સરલા અચ્યુથન.

ઍકેડેમિક કાઉન્સિલની ભલામણ

"આથી ઠરાવવામાં આવે છે કે પટેલ જે. બી. આર. આર્ટ્સ, પટેલ એ. એમ. આર. કૉમર્સ અને પટેલ જે. ડી. કે. દાવોલવાળા સાયન્સ કૉલેજ, બોરસદ નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૦૦-૦૦-૦૦૦૦ સુધીમાં કરે તો તેને બી.એ. (ગૌણ)માં કૉમ્પ્યુટર મથડ્સ, બી.કૉમ. (ગૌણ)માં કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશન અને બી.એસસી. (ગૌણ)માં કૉમ્પ્યુટર સાયન્સના અભ્યાસક્રમો શીખવવા માટે તારીખ ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૨૦૦૦ સુધીનું ચાલુ જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. કૉમ્પ્યુટરની પ્રયોગશાળામા મશીનોને અપગ્રેડ કરાવી એક સરવર પાંચ નોડની સવલત ઊભી કરવામાં આવે અને તેમાં પર્યાપ્ત મેમરી મૂકવામાં આવ જેથી વિન્ડોઝ સહિત અન્ય સૉફ્ટવેરનું નિદર્શન અભ્યાસક્રમની જરૂરિયાત પ્રમાણે થઈ શકે.

૨. પ્રાયોગિક કાર્ય માટે ભવિષ્યમાં પ્રતિમશીન એક વિદ્યાર્થીની બેચ રાખવામાં આવે.

૩. કૉમ્પ્યુટરના ફાજલ સમયનો ઉપયોગ ફક્ત આંતરિક વહીવટ તેમ જ શૈક્ષણિક કાર્ય માટે જ કરવામાં આવે;

૪. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજ પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચનો આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવ

૫. કોમ્પ્યુટર વિષયનાં પુસ્તકો માટે રૂ. ૫,૦૦૦નો તાત્કાલિક અનાવર્તક ખર્ચ કરવામાં આવે;

૬. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;

૭. કોમ્પ્યુટર વિષયનાં પુસ્તકો માટે પ્રતિવર્ષ રૂ. ૨,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે અને ચાર સામયિક નિયમિત વસાવવામાં આવે;

૮. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રોવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કોઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૯. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોટખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણનો અમલ કરવામાં આવે છે-આવશે."

પરિશિષ્ટ "૨૫/૬"

કામકાજ ક્રમાંક ૨ (૨૭) (૬)

એમ. એન્ડ વી. આર્ટ્સ એન્ડ કોમર્સ કૉલેજ, હાલોલમાં કોમ્પ્યુટર ઇન બિઝનેસ ઓપરેશન્સ ગૌણ વિષયના ચાલું જોડાણ અંગે સ્થાનિક તપાસસમિતિનો હેવાલ

અમે સ્થાનિક તપાસસમિતિના સભ્યો તરીકે એમ. એન્ડ વી. આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, હાલોલની તા. ૮-૫-૧૯૯૭ના રોજ મુલાકાત લીધી હતી. મુલાકાત દરમિયાન આચાર્યશ્રી આર. એ. સુતરિયાએ હાજર રહી પૂરી પાડેલી માહિતી નીચે મુજબ છે :

૧. કૉમ્પ્યુટર પ્રયોગશાળામાં બે એક્સટી, એક પીસી અને ૮૦ કૉલમનું એક પ્રિન્ટર વસાવવામાં આવેલ છે.

૨. પૂર્ણ સમયના પ્રોગ્રામર તેમ જ ખંડ સમયના વ્યાખ્યાતાની જગ્યાઓ હજુ ભરવામાં આવી નથી.

૩. કૉમ્પ્યુટર સાયન્સનાં આશરે ૧૧૧ જેટલાં પુસ્તકો વસાવવામાં આવ્યાં છે.

૪. ૧૯૯૫-૯૬ના વર્ષમાં એફ.વાય. બી.કૉમ.માં ૮ અને એસ.વાય. બી.કૉમ.માં પણ ૮ વિદ્યાર્થીઓને પ્રવેશ આપવામાં આવ્યો હતો. ૧૯૯૬-૯૭ના વર્ષમાં એફ.વાય. બી.કૉમ.માં ૧૭ અને એસ.વાય. બી.કૉમ.માં ૩ વિદ્યાર્થીઓએ પ્રવેશ મેળવેલ હતો.

૫. યુનિવર્સિટી દ્વારા પત્રાંક એકે/૨૧/૮૦૪૬૨/૧૯૯૭ તા. ૧૩-૧-૧૯૯૭થી કૉલેજને સ્ટાફની નિમણૂક જૂન, ૧૯૯૭ સુધી કરવા અન્યથા જૂન, ૧૯૯૭થી વિદ્યાર્થીઓને પ્રવેશ નહિ આપવા જણાવવામાં આવ્યું છે.

૬. કૉલેજ તરફથી આ સંદર્ભમાં ટૂંકમાં જ જાહેરખબર આપી સ્ટાફની નિમણૂક કરવામાં આવશે તેવી લેખિત બાંહધરી આપવામાં આવી છે. આ જોતાં સમિતિ નીચેની ભલામણ કરે છે :

કૉલેજ તરફથી નીચેની શરતોનું તાત્કાલિક પાલન થાય તો જ જૂન, ૧૯૯૭થી પ્રથમ વર્ષમાં વિદ્યાર્થીઓને પ્રવેશ આપવો અને એડહોક જોડાણ વધુ એક વર્ષ માટે લંબાવવું :

(૧) અભ્યાસક્રમને સુસંગત સોફ્ટવેરના નિદર્શન માટે પર્યાપ્ત મેમરી સહિત એક સરવર અને ઓછામાં ઓછા પાંચ નોડ (પેન્ટિયમ અથવા ૪૮૬) તેમ જ ૧૩૨ કૉલમનું પ્રિન્ટર તાત્કાલિક વસાવવાં.

(૨) પૂર્ણ સમયના પ્રોગ્રામર તેમ જ ખંડ સમયના વ્યાખ્યાતાની તાત્કાલિક નિમણૂક કરવી.

શ્રી આર. પી. સોની

શ્રી બી. વી. મહેતા

એકેડેમિક કાઉન્સિલની ભલામણ

"આથી ઠરાવવામાં આવે છે કે આર્ટ્સ એન્ડ કોમર્સ કૉલેજ, હાલોલ નિમણૂકો અંગેની સરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૧-૭-૧૯૯૭ સુધીમાં કરે તો તેને બી.કોમ. (ગૌણ)માં કોમ્પ્યુટર ઇન બિઝનેસ ઓપરેશન્સના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી તારીખ ૧૪-૬-૧૯૯૮ સુધીનું ચાલુ જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. પૂર્ણ સમયના કોમ્પ્યુટરના પ્રોગ્રામર અને ખંડ સમયના વ્યાખ્યાતાની નિમણૂક તા. ૧-૭-૧૯૯૭ પહેલાં તાત્કાલિક કરવામાં આવે;

૨. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજ પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચના આંકડા મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ જણાશે તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

૩. પ્રયોગશાળામાં એક (૪૮૬ અથવા પેન્ટીયમ) સરવર ઓછામાં ઓછા પાંચ (૪૮૬ અથવા ૩૮૬) નોડ ૧૩૨ કોલમના પ્રિન્ટર સાથે વસાવવામાં આવે;

૪. પ્રયોગશાળામાં અભ્યાસક્રમને સુસંગત વિન્ડોઝ આધારિત સોફ્ટવેરનું નિદર્શન કરી શકાય તેમ જ વિદ્યાર્થીઓને પૂરતો સમય આપી શકાય તે માટે પર્યાપ્ત મેમરી સહિત એક સરવર અને પાંચ નોડનું (પેન્ટીયમ અથવા ૪૮૬) અપગ્રેડેશન નવી ખરીદી કરી આયોજન કરવામાં આવે;

૫. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;

૬. પ્રાયોગિક કાર્ય પ્રતિમશીન એક વિદ્યાર્થી મુજબ ગોઠવવામાં આવે;

૭. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, [illegible] પ્રોવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા [illegible] શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને [illegible]

બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂ આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિ બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૮. કૉમ્પ્યુટર વિષયનાં પુસ્તકો અને સામયિકો માટે પ્રતિવર્ષ રૂ. ૩,૦૦૦નો ખર્ચ કરવામાં આવે.

૯. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગ નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવા સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અના જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-આવ

૧૦. કૉમ્પ્યુટરનો ઉપયોગ આંતરિક શૈક્ષણિક તેમ જ વહીવટી કાર્યો માટે જ કરવામાં આવે.

ઉપરોક્ત શરતોના સંતોષકારક પરિપાલનનો હેવાલ યુનિવર્સિટીને રજૂ કરવા તથા યુનિવર્સિટી તર જોડાણ મંજૂર કરવામાં ના આવે ત્યાં સુધી પ્રથમ વર્ષમાં આ વિષયમાં એક પણ વિદ્યાર્થીને પ્રવેશ ન આપવા આથી સૂચના આપવામાં આવે છે."

પરિશિષ્ટ "૨૫/૭"

કામકાજ ક્રમાંક ૨(૨૭) (૭)

સ્થાનિક તપાસસમિતિનો હેવાલ

શ્રીમતી એસ. સી. પટેલ ફરતીકૂઇવાલા કૉમર્સ કૉલેજ, ડભોઈમાં કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશન ગૌણ વિષયનું નવું જોડાણ આપવા અંગેનો સ્થાનિક તપાસસમિતિનો હેવાલ.

અમે સ્થાનિક કપાસસમિતિના સભ્યો તરીક શ્રીમતી એસ. પી. પટેલ ફરતીકૂઇવાલા કૉમર્સ કૉલેજ, ડભોઈની તા. ૮-૫-૧૯૯૭ના રોજ મુલાકાત લીધી હતી. મુલાકાત દરમિયાન આચાર્યશ્રી એલ. એમ. પટેલે હાજર રહી પૂરી પાડેલી માહિતી નીચે પ્રમાણે છે :

૧. કૉલેજે પોતાની કૉમ્પ્યુટરની વાતાનુકૂલિત પ્રયોગશાળા ઊભી કરી છે અને તેમાં બે પીસી/એક્સટી, બે પીસી ૩૮૬ અને એક પ્રિન્ટર વસાવેલ છે.

૨. સદરહુ વિષયના પ્રાયોગિક કાર્ય માટે સુસંગત પ્રકારના જેમાં વિન્ડોઝ તેમ જ તેને લગતા સોફ્ટવેરનું નિદર્શન થઈ શકે તેવા એક સરવર અને પાંચ નોડનું અપગ્રેડેશન/નવી ખરીદી કરી આયોજન કરવાની ખાતરી આપી છે.

૩. યુનિવર્સિટીનાં ધારાધોરણ અનુસાર એક પૂર્ણ સમયના પ્રોગ્રામર અને એક ખંડ સમયના વ્યાખ્યાતાની નિમણૂક વચગાળાના સમયમાં તાત્કાલિક કરવા અંગે પણ કૉલેજે પૂરતી તૈયારી દર્શાવી છે.

૪. કૉમ્પ્યુટર સાયન્સ વિષયનાં આશરે ૪૦ જેટલાં પુસ્તકોપેટે કૉલેજે રૂ. ૬,૮૦૦ જેટલો ખર્ચ કરેલ છે.

૫. વિદ્યાર્થીઓને આ વિષય લેવામાં રસ છે અને આ વિષય દાખલ કરવાથી અન્ય વિષયની સંખ્યા પર અસર થવાની શક્યતા નથી.

કૉમ્પ્યુટર વિષયની પ્રયોગશાળા તેમ જ અન્ય સવલતો તાત્કાલિક ઊભી કરવા અંગેની કૉલેજની તૈયારી જોતાં નીચેની શરતોએ એડહોક ધોરણે કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશન્સ વિષયનું જોડાણ જૂન, ૧૯૯૭થી બે વર્ષ માટે આપવા સમિતિ ભલામણ કરે છે :

૧. ઉપર જણાવ્યા પ્રમાણે એક સરવર અને પાંચ નોડ જેમાં વિન્ડોઝનું નિદર્શન/પ્રાયોગિક કાર્ય સહેલાઈથી કરી શકાય તે રીતે પ્રયોગશાળામાં ઇક્વિપમેન્ટ ખરીદી તાત્કાલિ આયોજન કરવામાં આવે;

૨. એક ખંડ સમયના વ્યાખ્યાતા અને એક પૂર્ણ સમયના પ્રોગ્રામરની યુનિવર્સિટીનાં ધારાધોરણ પ્રમાણે વિષય શરૂ કરતાં પહેલાં નિમણૂક કરવામાં આવે;

૩. દરેક વર્ષમાં વધુમાં વધુ ૩૦ વિદ્યાર્થીઓને મેરિટના ધોરણે પ્રવેશ આપવામાં આવે;

૪. પુસ્તકોપેટે પ્રથમ વર્ષ રૂ. ૫,૦૦૦નો અનાવર્તક અને પછીનાં વર્ષોમાં રૂ. ૨,૦૦૦ની આવર્તક ખર્ચ કરવામાં આવે. ચાર જેટલાં સામયિકો નિયમિત રીતે મેળવવામાં આવે;

૫. પ્રયોગશાળામાં નિભાવખર્ચપેટે પ્રતિસત્ર રૂ. ૩૦૦ની ફી લઈ શકાશ

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શ્રી આર. પી. સોની

ડૉ. સરલા અચ્યુત

એકેડેમિક કાઉન્સિલની ભલામણો

"આથી ઠરાવવામાં આવે છે કે શ્રીમતી એસ. સી. પટેલ ફરતીકૂઇવાલા કૉમર્સ કૉલેજ, ડભોઈમાં નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તારીખ ૧-૭-૧૯૯૭ સુધીમાં કરે તો બી.કૉમ. (ગૌણ)માં કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશનના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૯ સુધીનું નવું વધારાનું જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશન વિષય માટે (૧) પૂર્ણ સમયના પ્રોગ્રામરની અને (૨) ખંડ સમયના વ્યાખ્યાતાની નિમણૂક કરવામાં આવે;

૨. પ્રયોગશાળામાં અભ્યાસક્રમને અનુરૂપ વિન્ડોઝ આધારિત સોફ્ટવેરનું નિદર્શન કરી શકાય તેમ જ વિદ્યાર્થીઓને પૂરતો સમય આપી શકાય તે માટે એક સરવર અને પાંચ નોડનું અપગ્રેડેશન/નવી ખરીદી કરી આયોજન કરવામાં આવે;

૩. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચનો આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

૪. પુસ્તકો માટે પ્રથમ વર્ષ રૂ. ૫,૦૦૦નો અનાવર્તક ખર્ચ કરવામાં આવે;

૫. કૉમ્પ્યુટર સાયન્સના વિષયનાં પુસ્તકો માટે રૂ. ૨,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે.

૬. કૉમ્પ્યુટર સાયન્સના વિષય સંબંધી સામયિકો મંગાવવામાં આવે;

૭. ગુણવત્તાના ધોરણે અન્ય વિષયના કાર્યભારને અસર ન થાય તે રીતે ૩૦ વિદ્યાર્થીઓને પ્રવેશ આપવામાં આવે.

૮. પ્રતિમશીન બે વિદ્યાર્થીઓની બૅચ રાખવામાં આવે;

૯. કૉમ્પ્યુટર વિષય શીખવવા માટે કુલ રૂ. ૩૦૦ ફી સત્રદીઠ રાખવામાં આવે;

૧૦. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રૉવિડન્ટ ફંડ, ગ્રૅચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલા શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૧૧. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-અનામત."

પરિશિષ્ટ "૨૫/૮"

કામકાજ ક્રમાંક ૨ (૨૭) (૮)

એન. સી. બોડીવાલા કૉમર્સ કૉલેજ, અમદાવાદમાં ગૌણ વિષય કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશન્સના જોડાણ અંગેની તપાસસમિતિનો હેવાલ

અમે સ્થાનિક તપાસસમિતિના સભ્યો તરીકે અમદાવાદની એન. સી. બોડીવાલા કૉમર્સ કૉલેજની તા. ૧૦-૩-૧૯૯૭ના રોજ મુલાકાત લીધી હતી. મુલાકાત દરમિયાન આચાર્યશ્રી કાપડિયાએ હાજર રહી માહિતી પૂરી પાડી હતી.

સમિતિની અગાઉની તા. ૭-૩-૧૯૯૬ની મુલાકાતના હેવાલમાં જણાવ્યા પ્રમાણે નીચેની શરતોનું પાલન થયા પછી કાયમી જોડાણ અંગે વિચારણા થઈ શકે :

૧. પૂર્ણ સમયના પ્રોગ્રામરની નિમણૂક કરવામાં આવે;

૨. કૉમ્પ્યુટર સાયન્સ વિષયનાં પુસ્તકોપેટે રૂ. ૫,૦૦૦નો અનાવર્તક ખર્ચ કરવામાં આવે તેમ જ ચાર જેટલાં સામયિકો નિયમિત મંગાવવામાં આવે;

દરમિયાન હંગામી જોડાણ એક વર્ષ માટે લંબાવવા ભલામણ છે.

આર. પી. સોની

ડૉ. સરલા અચ્યુતન

એકેડેમિક કાઉન્સિલની ભલામણ

"આથી ઠરાવવામાં આવે છે કે એન. સી. બોડીવાલા કૉમર્સ કૉલેજ, અમદાવાદની નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૧૫-૭-૧૯૯૭ સુધીમાં કરે તો તેને બી.કૉમ. (ગૌણ)માં કૉમ્પ્યુટર સાયન્સના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૮ સુધી એક વર્ષ માટેનું જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. કૉમ્પ્યુટર પ્રોગ્રામરની તથા પૂર્ણ સમયના વ્યાખ્યાતાની યુનિવર્સિટી નિયમોનુસાર નિમણૂક કરવામાં આવે;

૨. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચનો આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

૩. સદરહુ વિષયનાં પુસ્તકો માટે રૂ. ૫,૦૦૦નો અનાવર્તક ખર્ચ કરવામાં આવે તથા ચાર સામયિકો નિયમિત રીતે વસાવવામાં આવે;

૪. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;

૫. પ્રોગ્રામિંગના કાર્ય માટે પ્રતિસપ્તાહ પ્રતિવિદ્યાર્થીને બે કલાક નિયમિત ફાળવવામાં આવે;

૬. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રૉવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલા શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૭. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-આવશે.

૮. કૉમ્પ્યુટરનો ઉપયોગ આંતરિક વહીવટ અને શૈક્ષણિક કાર્ય પૂરતો જ કરવો;

૯. મશીનોના નિભાવ માટે વિદ્યાર્થીદીઠ રૂ. ૩૦૦ ફી લેવામાં આવે;

૧૦. પ્રયોગશાળામાં અભ્યાસક્રમોને અનુરૂપ વિન્ડોઝ આધારિત સૉફ્ટવેરનું નિદર્શન કરી શકાય તેમ જ વિદ્યાર્થીદીઠ પૂરતો સમય ફાળવી શકાય તે માટે એક સરવર અને પાંચ નોડ અપ ગ્રેડેશન નવી ખરીદી કરી આયોજન કરવામાં આવે.

પરિશિષ્ટ "૨૫/૯"

કામકાજ ક્રમાંક ૨ (૨૭) (૯)

હાલોલની એમ. એન્ડ વી., આર્ટ્સ એન્ડ કૉમર્સ કૉલેજને બી.એ. (મુખ્ય)માં અંગ્રેજીનું કાયમી જોડાણ આપવા બાબતે સ્થાનિક તપાસસમિતિનો હેવાલ

ઉપરોક્ત કૉલેજને બી.એ. (મુખ્ય)માં અંગ્રેજી વિષયનું કાયમી જોડાણ આપવાના સંદર્ભમાં સ્થાનિક તપાસસમિતિના બંને સભ્યોએ કૉલેજની રૂબરૂ મુલાકાત લીધી હતી, તે સમયે કૉલેજના આચાર્યશ્રી સુતરિયા તથા સંચાલક મંડળના પ્રમુખશ્રી ઉપસ્થિત હતા.

કૉલેજ પાસે પૂરતા પ્રમાણમાં ઓરડાઓ છે. કૉલેજ પાસે હાલમાં બે પૂર્ણ સમયના વ્યાખ્યાતા છે. કૉલેજમાં એફ.વાય. બી.એ., એસ.વાય. બી.એ., ટી.વાય. બી.એ. એફ.વાય. બી.કૉમ., એસ.વાય. બી.કૉમ. અને ટી.વાય. બી.કૉમ. એમ દરેકનો એક વર્ગ છે એફ. વાય. બી.કૉમ.ના Commercial Communicationના ત્રણ તાસ ગણતરીમાં ફરજિયાત અંગ્રેજીના કુલ ૨૧ તાસ થાય, એફ.વાય. બી.એ. અને એસ.વાય. બી.એ.ના મુખ્ય અંગ્રેજીના ૫ + ૩ = ૧૫ તાસ થાય. તેથી ઉપરોક્ત ૨૧ + ૧૫ = ૩૬ તાસનો કાર્યભાર થાય. આ સિવાયનો કાર્યભાર ગણતરીમાં લેવો ઘટે.

ઉપરોક્ત બાબતો અને કાયમી, જોડાણ આપવા માટેની અરજી સાથે કૉલેજે રજૂ કરેલી વિગતોને ધ્યાનમાં લઈને આ કૉલેજને બી.એ. (મુખ્ય)માં અંગ્રેજી વિષયનું કાયમી જોડાણ નીચેની શરતોએ આપવાની ભલામણ કરવામાં આવે છે :

૧. કૉલેજે યુનિવર્સિટીના નિયમો અનુસાર જરૂરી શૈક્ષણિક સ્ટાફની નિયુક્તિ કરવાની રહેશે.

૨. કૉલેજે ૩૧મી જૂલાઈ સુધીમાં વર્ગવાર, વિષયવાર વિદ્યાર્થી સંખ્યાની જાણ યુનિવર્સિટીને કરવી.

ડૉ. એ. આર. શુક્લ

પ્રિ. જી. એન. પટેલ

એકેડેમિક કાઉન્સિલની ભલામણ

"આથી ઠરાવવામાં આવે છે કે એમ. એન્ડ વી. આર્ટ્સ એન્ડ કૉમર્સ કૉલેજ, હાલોલમાં નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૧૫-૭-૧૯૯૭ સુધીમાં કરે તો તેને બી.એ. (મુખ્ય)માં અંગ્રેજીના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી કાયમી જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. ઑર્ડિનન્સ ૧૨૦ અનુસાર શિક્ષકગણની નિમણૂક કરવામાં આવે;

૨. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચનો આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

૩. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;

૪. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રૉવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલા શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કાંઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૫. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી પ્રવેશ, શિક્ષક બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે આવશે.

૬. ૩૧મી જુલાઈ, ૧૯૯૭ સુધીમાં વર્ગવાર વિષયવાર, વિદ્યાર્થી સંખ્યાની જાણ યુનિવર્સિટીને અચૂક કરવી."

પરિશિષ્ટ "૨૫/૧૦"

કામકાજ ક્રમાંક ૨ (૨૭) (૧૦)

શેઠ ટી. સી. કાપડિયા આર્ટ્સ ઍન્ડ કૉમર્સ કૉલેજ બોડેલીમાં કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશન્સ ગૌણ વિ[illegible] ચાલુ જોડાણ અંગે સ્થાનિક તપાસસમિતિનો હેવાલ

અમે સ્થાનિક તપાસસમિતિના સભ્યો તરીકે શેઠ ટી. સી. કાપડિયા આર્ટ્સ ઍન્ડ કૉમર્સ કૉલેજ, બોડે[illegible] તા. ૮-૫-૧૯૯૭ના રોજ મુલાકાત લીધી હતી. મુલાકાત દરમિયાન આચાર્યશ્રી સી. એન. પટેલે હાજર રહી પૂ[illegible] પાડેલી માહિતી નીચે મુજબ છે :

૧. કૉમ્પ્યુટરની પ્રયોગશાળામાં બે પીસી ૩૮૬, એક પીસી અને એક પ્રિન્ટર વસાવવામાં આવેલાં છે.
૨. પ્રથમ વર્ષમાં આ વિષયમાં ૧૯૯૬-૯૭ના વર્ષમાં ૧૭ વિદ્યાર્થીઓ અને બીજા વર્ષમાં ૧૩ વિદ્યાર્થીઓને પ્રવે[illegible] આપવામાં આવ્યો છે.
૩. આ વિષયનાં લગભગ ૧૦૦ જેટલાં પુસ્તકો વસાવવામાં આવ્યાં છે.
૪. પૂર્ણ સમયના પ્રોગ્રામરની જગ્યા (એસ.ટી. માટે હોઈ) જાહેરખબર આપવા છતાં ઉમેદવારો ન મળવા[illegible] કારણે ભરી શકાઈ નથી. કૉલેજના જણાવ્યા પ્રમાણે આ ભરતી માટે તેમના પ્રયત્નો ચાલુ છે.
૫. ખંડ સમયના વ્યાખ્યાતા તરીકે શ્રી વ્યાસ સેવાઓ આપે છે અને વધુમાં પ્રાયોગિક કાર્ય કરાવવામાં [illegible] સેવાઓ આપે છે.

ઉપરોક્ત હકીકતના સંદર્ભે સમિતિ નીચે પ્રમાણે ભલામણ કરે છે :

૧. પ્રયોગશાળામાં અભ્યાસક્રમને અનુરૂપ વિન્ડોઝ આધારિત સોફ્ટવેરનું નિદર્શન કરી શકાય તેમ જ વિદ્યાર્થીઓને પૂરતો સમય આપી શકાય તે માટે એક સરવર અને પાંચ નોડ માઉસ સાથે પેન્ટિયમ અથવા ૪૮૬ પ્રકારના પર્યાપ્ત મેમરી સાથે વસાવવાનું તરત આયોજન કરવામાં આવે.
૨. કૉમ્પ્યુટર પ્રોગ્રામરની પૂર્ણ સમયની જગ્યા પર ઘનિષ્ટ પ્રયત્નો કરીને તાત્કાલિક ભરતી કરવામાં આવે.
૩. પુસ્તકો અને આર જેટલાં સામયિકો માટે રૂ. ૨,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે.
૪. પ્રતિમશીન એક વિદ્યાર્થી પ્રમાણે પ્રાયોગિક કાર્ય કરાવવામાં આવે.
૫. ઉપરોક્ત ૧થી ૪ શરતોનું એક વર્ષમાં પાલન કરવામાં આવે અને ત્યાં સુધી એડહોક જોડાણ એક વર્ષ માટે એટલે કે જૂન ૧૯૯૮ સુધી લંબાવવામાં આવે.

શ્રી આર. પી. સોની
શ્રી બી. વી. મહેતા

"આથી ઠરાવવામાં આવે છે કે સેઠ ટી. સી. કાપડિયા આર્ટ્સ ઍન્ડ કૉમર્સ કૉલેજ, બોડેલી નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૧૫-૭-૧૯૯૭ સુધીમાં કરે તો તેને બી.કૉમ. (ગૌણ)માં કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશનના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૮ સુધીનું વધારાનું-ચાલુ-કાયમી જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. કૉમ્પ્યુટર ઇન બિઝનેસ ઑપરેશન વિષય માટે (૧) પૂર્ણ સમયના પ્રોગ્રામરની નિમણૂક કરવામાં આવે અને (૨) ખંડ સમયના વ્યાખ્યાતાની નિમણૂક કરવામાં આવે;
૨. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલખર્ચનો આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;
૩. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;
૪. કૉમ્પ્યુટર સાયન્સ વિષયનાં પુસ્તકો માટે રૂ. ૨,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;
૫. પ્રયોગશાળામાં અભ્યાસક્રમને અનુરૂપ વિન્ડોઝ આધારિત સોફ્ટવેરનું નિદર્શન કરી શકાય તેમ જ વિદ્યાર્થીઓને પૂરતો સમય આપી શકાય તે માટે એક સરવર અને પાંચ નોડ માઉસ સાથે પેન્ટિયમ અથવા ૪૮૬ પ્રકારનાં પર્યાપ્ત મેમરી સાથે વસાવવાનું તરત આયોજન કરવામાં આવે;
૬. કૉમ્પ્યુટર સાયન્સના વિષય સંબંધી સામયિકો મંગાવવામાં આવે;
૭. ગુણવત્તાના કારણે અન્ય વિષયના કાર્યભારને અસર ન થાય તે રીતે ૩૦ વિદ્યાર્થીઓને પ્રવેશ આપવામાં આવે;

૮. પ્રતિમશીન બે વિદ્યાર્થીઓની બૅચ રાખવામાં આવે;
૯. કૉમ્પ્યુટર વિષય શીખવવા માટે કુલ રૂ. ૩૦૦ ફી સત્રદીઠ રાખવામાં આવે;
૧૦. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રૉવિડન્ટ ફંડ, ગ્રૅચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલા શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;
૧૧. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-આવશે."

પરિશિષ્ટ "૨૫/૧૧"

કામકાજ ક્રમાંક ૨ (૨૭) (૧૧)

ગોધરાની પી. ટી. આર્ટ્સ ઍન્ડ સાયન્સ કૉલેજને બી.એ. (મુખ્ય)માં અંગ્રેજીનું કાયમી જોડાણ આપવા બાબતે સ્થાનિક તપાસસમિતિનો હેવાલ

ઉપરોક્ત કૉલેજને બી.એ.(મુખ્ય)માં અંગ્રેજીનું કાયમી જોડાણ આપવાના સંદર્ભમાં સ્થાનિક તપાસસમિતિના બંને સભ્યોએ કૉલેજની મુલાકાત લીધી હતી. તે સમયે કૉલેજના આચાર્યશ્રી, અંગ્રેજી વિભાગના વડા તથા પ્રો. ગાંધી ઉપસ્થિત હતા.

કૉલેજ પાસે પૂરતી જરૂરિયાતો સાથેની Language Laboratory છે. પર્યાપ્ત શૈક્ષણિક સ્ટાફ કાયમી ધોરણે છે. ૧૯૯૬-૯૭ના વર્ષ દરમિયાન એફ.વાય. બી.એ., એસ.વાય. બી.એ., તથા ટી.વાય. બી.એ.માં સ્પે. અંગ્રેજી વિષય રાખનાર વિદ્યાર્થીઓની સંખ્યા અનુક્રમે ૬૯, ૫૨ અને ૩૩ હતી. કૉલેજના પુસ્તકાલયમાં અંગ્રેજી વિષયનાં જરૂરી પુસ્તકો પૂરતા પ્રમાણમાં છે.

ઉપરોક્ત બાબતો અને કાયમી જોડાણ આપવા માટેની અરજી સાથે કૉલેજે રજૂ કરેલી વિગતોને ધ્યાનમાં લઈને આ કૉલેજને બી.એ. (મુખ્ય)માં અંગ્રેજીનું કાયમી જોડાણ આપવાની ભલામણ કરવામાં આવે છે.

ડૉ. એ. આર. શુક્લ
પ્રિ. જી. એન. પટેલ

પરિશિષ્ટ "૨૫/૧૨"

કામકાજ ક્રમાંક ૨ (૨૭) (૧૨)

શાહ કે. એસ. આર્ટ્સ ઍન્ડ વી. એમ. પારેખ કૉમર્સ કૉલેજ, કપડવંજ
સ્થાનિક તપાસસમિતિનો હેવાલ

શાહ કે. એસ. આર્ટ્સ ઍન્ડ વી. એમ. પારેખ કૉમર્સ કૉલેજ, કપડવંજની આવેલી અરજીના સંદર્ભમાં ગુજરાત યુનિવર્સિટીએ નિમેલી સ્થાનિક તપાસસમિતિએ ઉપરોક્ત કૉલેજમાં તા. ૨૧-૩-૧૯૯૭ના રોજ રૂબરૂ મુલાકાત લીધી હતી અને તે અંગેનો હેવાલ નીચે પ્રમાણે છે :

૧. કૉલેજના આચાર્ય, અધ્યાપકો તેમ જ નોન-ટીચિંગ સ્ટાફ સાથે વિચારવિનિમય કરવામાં આવ્યો હતો.
૨. કૉલેજનું મકાન સારું અને પૂરતી સગવડવાળું છે.
૩. લાઇબ્રેરીની વ્યવસ્થા સારી છે. જે તે વિષયોને સ્પર્શતાં પુસ્તકો સારા પ્રમાણમાં છે. સામયિકો, જર્નલો એકંદરે સંતોષકારક અને નિયમિત આવે છે. લાઇબ્રેરી તેમ જ કૉલેજની વધુ પ્રગતિ થાય તે માટે કૉલેજના આચાર્ય ખૂબ જ સક્રિય જણાય છે.
૪. આર્ટ્સ વિભાગમાં (બી.એ. કક્ષા સુધી) અંગ્રેજી, સંસ્કૃત, ગૃહવિજ્ઞાન અને મનોવિજ્ઞાનના વિષયો માટે કાયમી જોડાણ આપવાની ભલામણ કરવામાં આવે છે.
૫. કૉમર્સ વિભાગમાં (પ્રથમ વર્ષ બી.કૉમ.માં) જૂન, ૧૯૯૭થી અમલમાં આવે તે રીતે આંકડાશાસ્ત્ર વિષય લેનાર વિદ્યાર્થીઓ મળી રહે તે અપેક્ષાએ તા. ૧૪-૬-૧૯૯૮ સુધી આંકડાશાસ્ત્રનું ગૌણ વિષય તરીકે નવું જોડાણ કામચલાઉ આપવાની ભલામણ છે. આ જોડાણથી બીજા વિષયો પર અને તે વિષયના કાર્યભાર પર અસર થશે નહીં.

આ વિષયમાં કાર્યભાર વધે તે અંગેની આવશ્યક સરકારી મંજૂરીની અપેક્ષાએ ભલામણ છે.

ઍકેડેમિક કાઉન્સિલની ભલામણ

આથી ઠરાવવામાં આવે છે કે શાહ કે. એસ. આર્ટ્સ, વી. એમ. પારેખ કૉમર્સ કૉલેજ, કપડવંજની નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૫-૩-૧૯૯૭ સુધીમાં કરે તો તેને બી.એ. (મુખ્ય)માં અંગ્રેજી, બી.કૉમ. (ગૌણ)માં આંકડાશાસ્ત્રના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૮ સુધીનું વધારાનું જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. ઑર્ડિનન્સ-૧૨૦ (એ) અનુસાર કાર્યભારના સંદર્ભમાં જરૂરી શિક્ષકગણની નિમણૂક કરવામાં આવે;
૨. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચના આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;
૩. પુસ્તકાલયમાં અંગ્રેજી અને આંકડાશાસ્ત્ર વિષયનાં પુસ્તકો વસાવવામાં આવે તથા અંગ્રેજી અને આંકડાશાસ્ત્રનાં પુસ્તકો માટે રૂ. ૧૦,૦૦૦નો અનાવર્તક ખર્ચ કરવામાં આવે;
૪. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;
૫. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રૉવિડન્ટ ફંડ, ગ્રૅચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલા શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;
૬. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-આવશે."

પરિશિષ્ટ "૨૫/૧૩"

કામકાજ ક્રમાંક ૨ (૨૭) (૧૩)

The committee has visited the K. B. Institute of Pharmaceutical Education and Research. Gandhinagar on 1st May, 1997.

The members took a round of the laboratories, library etc. The members have also visited the New Premises (Proposed Pharmacy Building). The new building is almost in completion and most adequate for the Pharmacy Institution. The laboratory facilities are good. The Hostels are also ready and found that it is already occupied by the Pharmacy College Students

The committee recommend the affiliation to 3rd year B.Pharm. Course with the following conditions :

(a) The following staff should be appointed :

(A) Teaching

No Subject	*Professors*	*Reader*	*Lecturer*
1. Pharmaceutics/ Pharmaceutical Technology	1	1 + 1*	1 (Note.--*Vacant-post).
2. Pharmaceutical Chemistry	1	1	1
3. Pharmacognosy	-	1	1
4. Pharmacology	-	1	-
Total...	2	4 + 1*	3

(B) Non Teaching Posts :

1. Lab Assistant	2
2. Lab Attender	2
3. Animal House-Keeping	1
4. Sweeper	1

(b) Equipments : The apparatus equipments should be purchased as per the list attached. (Appendix 1).

(c) The college should also be shifted to the new building e.g. by the academic year stating from, 1997.

The final affiliation would be granted after receiving the fulfillment report.

Prof. K. S. Shastri
Dr. Y. K. Agrawal
Prin. D. M. Sikh.

Appendix - 1
List of the Equipments

(1) pH meter
(2) Conductivity bridge
(3) Colorimeter
(4) Laminar flow
(5) Organ bath
(6) HPLC
(7) IR or FT-IR
(8) Signal pan balance
(9) Quick fit glass wares volumetric flask, round bottom flask, condensers etc
(10) TLC
(11) Rotary shaker
(12) Water bath/heating mantel
(13) Glasswares for pharmaceutics
(14) Dissolution apparatus
(15) Tablet mechine
(16) Capsule filling mechine
(17) Injection filling mechine
(18) Disintrigation apparatus
(19) Microscope

આથી ઠરાવવામાં આવે છે કે કે. બી. ઇન્સ્ટિટ્યૂટ ઑફ ફાર્માસ્યુટિકલ એજ્યુકેશન ઍન્ડ રિસર્ચ, ગાંધીનગર નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. [illegible]-૧૯૯૭ સુધીમાં કરે તો તેને બી.ફાર્મ.ના અભ્યાસક્રમ શીખવવા માટે ચાલુ અને ત્રીજું બી.ફાર્મ.ના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૮ સુધીનું વધારાનું જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

નીચે પ્રમાણે નિમણૂકો કરવામાં આવે :

ક્રમ વિષય	પ્રોફેસર	રીડર	લેક્ચરર
૧. ફાર્માસ્યુટિક્સ ફાર્માસ્યુટિક્સ ટેક્નોલોજી	૧	૧ + ૧	૧
૨. ફાર્માસ્યુટિકલ કેમિસ્ટ્રી	૧	૧	૧
૩. ફાર્માકોગ્નોસી	-	૧	૧
૪. ફાર્માકોલોજી	-	૧	-

(બ) નોન-ટીચિંગ પોસ્ટ :

૧. લેબ. આસિસ્ટન્ટ (૨), લેબ એટેન્ડન્ટ	૨
૨. એનિમલ હાઉસકીપિંગ	૧
૩. સફાઈ કામદાર	૧

૩. એ.આઈ.સી.ટી. યાદી મુજબ પ્રયોગશાળા માટે આ સાથે સામેલ યાદી મુજબનાં સાધનો વસાવવામાં આ

૪. ફાર્મસી માટે જર્નલ્સ ખરીદવામાં આવે અને જરૂરી પુસ્તકો વસાવવામાં આવે.

૫. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક કરવામાં આવે;

૬. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રૉવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમજ છૂટા થયે શિક્ષકવર્ગના તેમજ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી ન તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ વિદ્યાર્થીઓની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૭. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-આવશે.

પરિશિષ્ટ "૨૫/૧૪"

કામકાજ ક્રમાંક ૨ (૨૭) (૧૪)

સ્થાનિક તપાસસમિતિનો હેવાલ

આચાર્યશ્રી, સરસપુર આર્ટ્સ તથા કૉમર્સ કોલેજ, અમદાવાદ તરફથી તેમની કોલેજમાં આગામી સત્રથી ભૂગોળ વિષયને પ્રથમ ગૌણ વિષય તરીકે તથા સંસ્કૃત વિષયને દ્વિતીય ગૌણ વિષય તરીકે શરૂ કરવા માટેની જોડાણઅરજી કરવામાં આવી હતી.

આ જોડાણ તથા માન્યતા આપવા માટેની શક્યતાઓ માટે માનનીય કુલપતિશ્રીએ બે સભ્યોની સ્થાનિક તપાસસમિતિની નિમણૂક કરી હતી. આ સભ્યોનાં નામ નીચે મુજબ છે :

૧. ડૉ. વિજયભાઈ પંડ્યા	ભાષા-સાહિત્ય ભવન,	ગુજરાત યુનિવર્સિટી,	અમદાવાદ-૯
૨. ડૉ. ના. ગ. દીક્ષિત	ભૂગોળ ભવન	"	"

આ બન્ને સભ્યોએ તા. ૧૮-૬-૧૯૯૭ના રોજ સવારે ૧૧-૩૦ કલાકે સરસપુર આર્ટ્સ તથા કૉમર્સ કૉલેજની મુલાકાત લીધી હતી અને જોડાણ સંબંધિત બાબતોની માહિતી મેળવી હતી. તપાસસમિતિની મુલાકાત દરમિયાન આચાર્યશ્રીએ જાતે હાજર રહીને સભ્યોએ માગેલી માહિતી પૂરી પાડી હતી.

આ તપાસ દરમિયાન નીચેની હકીકત સ્પષ્ટ થઈ હતી જેની નોંધ આ સાથે સર્વાનુમતે કરવામાં આવી છે:

૧. ભૂગોળ :

(ક) "હાલ ભૂગોળ વિષયનું અધ્યાપન પ્રથમ તથા દ્વિતીય વર્ષ બી.એ.માં દ્વિતીય ગૌણ વિષય તરીકે કરાવવામાં આવે છે. છેલ્લાં ત્રણ વર્ષ દરમિયાન વિદ્યાર્થીઓની સંખ્યા સરેરાશ ૭૦ રહી છે. તેવી જ રીતે સેકન્ડ બી.એ.માં વિદ્યાર્થીઓની સંખ્યા ૫૦થી વધુ રહી છે. આથી ભૂગોળ વિષયનું પ્રથમ ગૌણ વિષય તરીકેનું જોડાણ આપવાથી પૂરતી સંખ્યામાં વિદ્યાર્થીઓ માટે પ્રવેશ શક્ય બનશે."

(ખ) ભૂગોળ વિષયના અધ્યાપન માટે હાલ એક ખંડકાલીન અધ્યાપકની નિમણૂક થયેલી છે. તેમનો સાપ્તાહિક કાર્યભાર ૬/૨ એમ કુલ ૮ તાસનો છે. સૂચિત જોડાણ માન્ય થયેથી કુલ કાર્યભાર વધશે જેથી ઓછામાં ઓછા એક પૂર્ણકાલીન વ્યાખ્યાતાની જરૂર ઊભી થશે.

(ગ) ભૂગોળ વિષયક પુસ્તકોની સંખ્યા વિદ્યાર્થીઓની સંખ્યાને અનુલક્ષીને સંતોષકારક જણાઈ છે. વધારાનાં પુસ્તકો વસાવવાની આચાર્યશ્રીએ ખાતરી આપી છે.

(ઘ) ભૂગોળના અધ્યાપનમાં જરૂરી બને તેવાં દૃશ્ય-શ્રાવ્ય સાધનો સંખ્યામાં ઉપલબ્ધ છે.

૨. સંસ્કૃત :

(ક) "સંસ્કૃત વિષયનું અધ્યાપન હાલ પ્રથમ વર્ષ બી.એ. કક્ષાએ માત્ર ફરજિયાત વિષય તરીકે કરાવવામાં આવે છે. જે આચાર્યશ્રીએ આપેલી માહિતી મુજબ ઘણા વિદ્યાર્થીઓ સંસ્કૃત વિષયને દ્વિતીય ગૌણ વિષય તરીકે રાખવા ઉત્સુક છે."

(ખ) "હાલ સંસ્કૃતના અધ્યાપન માટે એક ખંડકાલીન અધ્યાપકની નિમણૂક થયેલી છે. તેમનો કાર્યભાર ૬/૨ એમ ૮ છે. સૂચિત જોડાણ મંજૂર કરવાથી કાર્યભાર વધવાથી એક પૂર્ણકાલીન વ્યાખ્યાતાની જરૂર ઊભી થશે."

(ગ) વધારાનાં પુસ્તકો વસાવવાની આચાર્યશ્રીએ ખાતરી આપી છે.

ઉપરોક્ત વિગતોને આધારે આ સ્થાનિક તપાસસમિતિ સરસપુર આર્ટ્સ તથા કૉમર્સ કૉલેજ, અમદાવાદને વર્ષ ૧૯૯૭-૯૮થી ભૂગોળ વિષયનું પ્રથમ ગૌણ વિષય તરીકેનું અને સંસ્કૃત વિષયનું દ્વિતીય ગૌણ વિષય તરીકેનું જોડાણ તથા માન્યતા આપવાની બલામણ કરે છે. આ જોડાણ માટે કૉલેજે નીચે જણાવેલી શરતો પરિપૂર્ણ કરવાની રહેશે :

શરતો

૧. ભૂગોળ તથા સંસ્કૃત વિષયો માટેનાં વધારાનાં પુસ્તકોની ખરીદી બનતી ત્વરાએ કરશે.

૨. ભૂગોળ તથા સંસ્કૃત વિષયમાં પ્રત્યેકમાં એક પૂર્ણકાલીન વ્યાખ્યાતાની નિમણૂક કરશે.

આ બંને શરતોનું પાલન થયાની જાણ કૉલેજે ગુજરાત યુનિવર્સિટીને તાત્કાલિક કરવાની રહેશે.

ડૉ. વિજયભાઈ પંડ્યા

ડૉ. ની. ગ. દીક્ષિત

ઍકેડેમિક કાઉન્સિલની ભલામણ

આથી ઠરાવવામાં આવે છે કે સરસપુર આટ્‌ર્સ ઍન્ડ કૉમર્સ કૉલેજ, અમદાવાદમાં નિમણૂકો અંગેની સમિતિની નીચે જણાવેલ શરતોનું પાલન ઍક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૧૦ ઑગસ્ટ, ૧૯ સુધીમાં કરે તો તેને બી.એ. પ્રથમ (ગૌણ)માં ભૂગોળના એસ. બી. (ગૌણ) સંસ્કૃતના અભ્યાસક્રમો શીખવવા તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૮ સુધીનું વધારાનું જોડાણ આપવા માટે ઍક્ઝિક્યુટિવ કાઉન્સિ ભલામણ કરવી :

૧. ઑર્ડિ. ૧૨૦-એ અનુસાર જરૂરી શિક્ષકગણની નિમણૂક કરવામાં આવે;

૨. સંસ્કૃત વિષય તથા ભૂગોળ વિષયમાં પૂર્ણ સમયના વ્યાખ્યાતાની નિમણૂક કરવામાં આવે;

૩. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ ખર્ચના આંકડા મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણ તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

૪. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખ કરવામાં આવે;

૫. ભૂગોળ વિષયનાં પુસ્તકો માટે રૂ. ૧૫,૦૦૦નો અનાવર્તક ખર્ચ કરવામાં આવે તથા સંસ્કૃત વિષયનાં પુસ્ત ખરીદવામાં આવે,

૬. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવા ભથ્થું, પ્રૉવિડન્ટ ફંડ, ગ્રૅચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમજ છૂટા થયેલ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૭. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત માટે સરકારે/યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-આવશે.

૮. ભૂગોળ વિષય માટે રૂ. ૫૦,૦૦૦નો ખર્ચ કરવામાં આવે (સાધનો, ઇક્વિપમેન્ટ, નકશા ઇત્યાદિ માટે);

૯. ભૂગોળ માટે રૂ. ૧૫,૦૦૦નાં પુસ્તકો વસાવી તેની યાદી યુનિવર્સિટીને મોકલવી.”

પરિશિષ્ટ “૨૫/૧૫”

કામકાજ ક્રમાંક ૨ (૨૭) (૧૫)

ઉમા આટ્‌ર્સ ઍન્ડ નાથીબા મહિલા કૉમર્સ કૉલેજ, ગાંધીનગરનો સ્થાનિક તપાસસમિતિનો હેવાલ

બી.એ. કક્ષાએ ભૂગોળ વિષયને મુખ્ય વિષય તરીકે આપવા કાયમી જોડાણ આપવા માટે સોમવાર, તા. ૨૩ જૂન, ૧૯૯૭ના રોજ સવારે ૯-૩૦ કલાકે ઉમા આટ્‌ર્સ અને નાથીબા કૉમર્સ મહિલા કૉલેજ, ગાંધીનગરની મુલાકાત લીધી. સ્થાનિક તપાસસમિતિના સભ્યો કૉલેજના આચાર્યશ્રી એસ. સી. પટેલ અને ભૂગોળ વિભાગના અધ્યાપકો પ્રો. શ્રીમતી ફાલ્ગુની પટેલ અને શ્રી જયમલભાઈ રંગીયાને આ સંદર્ભમાં મળ્યા અને જુદી જુદી બાબતો અંગે ચર્ચા કરી. જેવી કે ભૂગોળને મુખ્ય વિષય તરીકે રાખતા વિદ્યાર્થીઓની સંખ્યા, વિભાગમાં અધ્યાપકોની સંખ્યા, હાલમાં કુલ કાર્યભાર પ્રયોગશાળાની જગ્યા, સાધનો (મોજણી માટેનાં સાધનો, હવામાનનાં સાધનો), ટોપીશાટ્‌સ હવામાન, નકશા, લાઇબ્રેરીની સગવડ (ભૂગોળ વિષયનાં પ્રાપ્ત એવાં અંગ્રેજી અને ગુજરાતી માધ્યમનાં પુસ્તકો) વગેરેની માહિતી મેળવી નીચેની માહિતી તારવવામાં આવી :

૧. ભૂગોળને મુખ્ય વિષય તરીકે રાખતા વિદ્યાર્થીઓની સંખ્યા પ્રથમ વર્ષ બી.એ.માં ૨૭, બીજા વર્ષમાં ૨૧ અને ત્રીજા વર્ષમાં ૨ છે, જે દર્શાવે છે કે વધુ ને વધુ વિદ્યાર્થીઓ આ વિષય લઈ રહ્યા છે.

૨. એ જ રીતે ભૂગોળ વિષયને ગૌણ અને દ્વિતીય ગૌણ વિષય તરીકે રાખવા વિદ્યાર્થીઓની સંખ્યા પ્રથમ વર્ષ બી.એ. કક્ષાએ અનુક્રમે ૩૪ અને ૪૨ અને દ્વિતીય વર્ષ બી.એ. કક્ષાએ ૨૬ અને ૩૫ છે.

૩. હાલમાં ભૂગોળ વિભાગમાં બે પૂરા સમયના વ્યાખ્યાતાઓ છે. વધતા કાર્યભારને પહોંચી વળવા ૧૯૯૭-૯૮ના શૈક્ષણિક વર્ષ દરમિયાન કૉલેજ એક પૂરા સમયના અને એક ખંડ સમયના અધ્યાપકની ભરતી કરનાર છે. આ માટે સરકારમાંથી મંજૂરી મેળવવાની દિશામાં પ્રક્રિયા ચાલુ છે.

૪. ભૂગોળ વિભાગે પ્રયોગાત્મક કાર્ય માટે પ્રયોગશાળાની કામચલાઉ વ્યવસ્થા કરેલ છે. ચાલુ વર્ષમાં લાઇબ્રેરી નવા મકાનમાં લઈ જવાથી ભૂગોળની પ્રયોગશાળા માટે તે જગ્યા ઉપલબ્ધ બનશે. જરૂરી ફર્નિચરનો ઑર્ડર કૉલેજના સત્તાવાળા દ્વારા અપાશે.

૫. મોજણી માટેનાં સાધનો જેવાં કે, પ્લેન ટેબલ, ચેઇન-ટેપ અને કંપાસ ખરીદવામાં આવ્યાં છે. ઉપરાંત થર્મૉમિટર્સ, ઍનેરોઇડ બેરોમીટર, દીવાલ ટાંગવાના નકશા વગેરે ખરીદવામાં આવ્યાં છે. રંગીન ટી.વી. ખરીદવામાં આવ્યું છે અને ટૂંક સમયમાં વી.સી.આર. તથા શૈક્ષણિક, ભૌગોલિક વિડિયો કેસેટ્સ ખરીદવામાં આવશે. ઘણા સારા એટલાસ ખરીદાયા છે.

ભૂગોળ વિભાગનો સમગ્ર રીતે છેલ્લા એક વર્ષ દરમિયાન વિકાસ જોતાં, અને સ્થાનિક તપાસસમિતિના સભ્યો બી.એ.ને હવે પછીના ત્રણ વર્ષ માટે (એપ્રિલ, ૨૦૦૦ સુધી) ભૂગોળ વિષયને મુખ્ય વિષય તરીકે શીખવવા માટેની મંજૂરી આપવા ભલામણ કરીએ છીએ ત્યાં સુધીમાં કૉલેજે વધુ મોટી જગ્યામાં કાયમી પ્રયોગશાળા, પૂરતું ફર્નિચર, પ્રયોગાત્મક કાર્યનાં સાધનો, વધુ સંખ્યામાં ટોપોશીટ, વધુ શૈક્ષણિક સ્ટાફ, લેબોરેટરી આસિસ્ટન્ટ, ખડકો, નકશા, ડિશપ્લે કરવા માટેના ઘોડા, નકશા માટેનાં વિશિષ્ટ કબાટો, ટ્રેસિંગ ટેબલો, ડ્રૉઇંગ બૉર્ડ્સ તથા શૈક્ષણિક પ્રવાસ માટેનું બજેટ વગેરે પૂરાં પાડવાનાં રહેશે. ઇત્યાદિસ. ૨૦૦૦ની પ્રગતિને ધ્યાનમાં લઈને કાયમી જોડાણ અંગે વિચારી શકાય. હાલમાં અમે, ગુજરાત યુનિવર્સિટીને બી.એ. કક્ષાએ ભૂગોળ વિષય તરીકે ત્રણ વર્ષ રાખવાની મંજૂરી આપવા ભલામણ કરીએ છીએ.

કે. એમ. કુલકર્ણી
બી. એસ. પરમાર

એકેડેમિક કાઉન્સિલની ભલામણ

[illegible] કરવામાં આવે છે કે ઉમા આર્ટ્સ એન્ડ નાથીબા કોમર્સ મહિલા કોલેજ, ગાંધીનગરમાં [illegible] [illegible] શરત સહિત નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તારીખ [illegible] [illegible]૧૯૯૭ સુધીમાં કરે તો તેને બી.એ. (મુખ્ય)માં ભૂગોળના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯[illegible] તા. [illegible] સુધીનું [illegible] વર્ષ માટે ચાલુ જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ [illegible]

૧. ઓર્ડિ. ૧૨૦-એ અનુસાર જરૂરી શિક્ષકગણની નિમણૂક કરવામાં આવે;
૨. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કોલેજે પોતાના ભંડોળમાંથી કરેલ [illegible] ખર્ચનો આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહે[illegible] જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;
૩. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક [illegible] કરવામાં આવે;
૪. ભૂગોળ વિષયના પુસ્તકો માટે રૂ. ૫,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;
૫. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમજ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ[illegible] મોંઘવારી ભથ્થું, પ્રોવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ [illegible] થયેલ શિક્ષકવર્ગના તેમજ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું [illegible] નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કાંઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવ[illegible] આપવામાં આવે તેમજ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ[illegible] બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂ[illegible] બાકી [illegible] પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;
૬. [illegible] અલાયદા સુસજ્જ પ્રાયોગિક ખંડની જરૂરી ફર્નિચર સહિતની વ્યવસ્થા કરવામાં આવે;
૭. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીઓની [illegible] ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ [illegible] અને સામાજિક રીતે પછાત જાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત [illegible] યુનિવર્સિટીએ [illegible] ધારાધોરણોનો અમલ કરવામાં આવે છે-આવશે. [illegible] ખર્ચ કરવામાં આવે (સગવડો, બાંકડા, ડ્રેસિંગ ટેબલ, શૈક્ષણિક પ્રવાસ, [illegible]મેન્ટ, નકશા ઇત્યાદિ માટે);
૯. [illegible], હવાઉજાસ સાથેનો, પ્રાયોગિક સાધનોથી સુસજ્જ અલાયદો પ્રાયોગિક ખંડ કાયમી ધોરણે કરવો;
૧૦. જોડાણની [illegible] શરત મુજબ ભૂગોળ માટે રૂ. ૧૫,૦૦૦માં જે પુસ્તકો વસાવેલ હોય તેની યાદી યુનિવર્સિટીને મોકલવી.
૧૧. પ્રાયોગિક ખંડમાં વિદ્યાર્થીઓને બેસવા જરૂરી ફર્નિચર સત્વરે વસાવવામાં આવે."

પરિશિષ્ટ "૨૫/૧૬"

કામકાજ ક્રમાંક ૨ (૨૭) (૧૬)

આર્ટ્સ ઍન્ડ કૉમર્સ કૉલેજ, મુવાલનો હેવાલ

અમે તા. ૧૮-૬-૧૯૯૭ના રોજ આર્ટ્સ એન્ડ કોમર્સ કોલેજ, મુવાલ, જિ. વડોદરાની રૂબરૂ મુલાકાત લીધી હતી.

અમે વ્યવસ્થાપક સમિતિના સભ્યો, આચાર્યશ્રી, અધ્યાપકો અને બિનશૈક્ષણિક કર્મચારીઓને અલગ અલગ મળ્યા હતા.

અમને નીચે પ્રમાણે ક્ષતિ જણાઈ છે :

૧. કર્મચારીઓનો (શૈક્ષણિક અને બિનશૈક્ષણિક) પગાર માર્ચ, ૧૯૯૭ સહિત આજદિન સુધી થયો નથી.
૨. ડી.એ.નો વધારો તા. ૧-૧-૧૯૯૭થી આપ્યો છે પરંતુ પાછલા બે હપતાનું એરિયર્સ બાકી છે.
૩. વચગાળાની રાહત તા. ૧-૧-૧૯૯૭થી પગારમાં આપી છે પરંતુ એરિયર્સ બાકી છે.
૪. સ્ટાફરૂમમાં અધ્યાપકોને બેસવા સહિતની સુવિધાઓ ઉપલબ્ધ નથી.
૫. સમાજશાસ્ત્રના અધ્યાપકને ફરજિયાત ગુજરાતી વિષય ભણાવવા દબાણ કર્યું છે.
૬. ૧૯૯૬-૯૭ના વર્ષમાં અર્થશાસ્ત્ર (મુખ્ય) એફ.વાય. બી.એ.માં આપવામાં આવ્યું ન હતું. આ અંગે યુનિવર્સિટી સમક્ષ કોઈ રજૂઆત થઈ નથી કે કાર્યવાહી કરવામાં આવી ન હતી.
૭. ગુજરાતીમાં હજી એક પૂર્ણ સમયના તથા એક ખંડ સમયના વ્યાખ્યાતાની જગ્યા ભરવાની બાકી છે. આ ઉપરાંત અંગ્રેજી ખંડ સમયના, અર્થશાસ્ત્રમાં એક પૂર્ણ સમયના અને એક ખંડ સમયના, કોમર્સમાં એક પૂર્ણ સમયના, એક ખંડ સમયના, વેપારી કાયદોમાં એક ખંડ સમયના આંકડાશાસ્ત્રની જગ્યા ભરવાની રહે છે.

એવી જ રીતે બિનશૈક્ષણિક જગ્યાઓમાં સિનિયર ક્લાર્ક-૨, જુનિયર ક્લાર્ક-૧, ગ્રંથપાલ- ૧ની જગ્યાઓ ભરવાની બાકી રહે છે :

-- અમે વ્યવસ્થાપક સમિતિને તથા આચાર્યશ્રીને જણાવ્યું છે કે તા. ૩૦-૬-૧૯૯૭ સુધીમાં બાકી લેણાની રકમ પગાર સહિત ચૂકવી દેવી.
- આ વ્યવસ્થા પૂર્ણ ન થાય ત્યાં સુધી પ્રથમ વર્ષ આર્ટ્સ અને કોમર્સમાં પ્રવેશ આપવા નહીં.

અમે (--) આ અંગે તાર રજિસ્ટ્રાર દ્વારા કોલેજને પહોંચે એવી ભારપૂર્વક ભલામણ કરીએ છીએ.

આર. એચ. વ્યાસ

એ. આર. શાહ

એકેડેમિક કાઉન્સિલની ભલામણ

[illegible] કરવામાં આવે છે કે આર્ટ્સ એન્ડ કોમર્સ કોલેજ, મુવાલમાં [illegible] નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૩૦-૭-૧૯૯૭ સુધીમાં કરે તો તેને બી.એ. (મુખ્ય)માં ગુજરાતી, સમાજશાસ્ત્ર, અર્થશાસ્ત્ર; બી.એ. (ગૌણ)માં સંસ્કૃત; બી.કોમ. (મુખ્ય)માં [illegible] અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી તા. [illegible] સુધીનું ચાલુ જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. શૈક્ષણિક અને બિનશૈક્ષણિક કર્મચારીઓનો પગાર તા. ૩૦-૬-૧૯૯૭ સુધીમાં બાકી પગાર સહિત ચૂકવી દેવો;
[illegible] આ વ્યવસ્થા પૂર્ણ ન થાય ત્યાં સુધી પ્રથમ વર્ષ આર્ટ્સ અને કોમર્સમાં પ્રવેશ આપવા નહીં.
૨. ડી.એ.ના પાછલા બે હપતાનું એરિયર્સ બાકી છે તે ચૂકવી દેવાની ખાતરી આપવામાં આવે;
૩. સ્ટાફ રૂમમાં અધ્યાપકોની બેસવા સહિતની સુવિધા ઉપલબ્ધ કરવામાં આવે;
૪. ગુજરાતીના ખંડ સમયના વ્યાખ્યાતા, ગુજરાતીના પૂર્ણ સમયના વ્યાખ્યાતાની નિમણૂક કરવામાં આવે;
[illegible] ખંડ સમયના વ્યાખ્યાતાની નિમણૂક કરવામાં આવે;
[illegible] પૂર્ણ સમયના, ખંડ સમયના વ્યાખ્યાતાની [illegible] કરવામાં [illegible], [illegible] એક પૂર્ણ [illegible] સમયના [illegible] નિમણૂક કરવામાં આવે, [illegible] એક ખંડ સમયના [illegible]
[illegible] આંકડાશાસ્ત્રના [illegible] સમયના વ્યાખ્યાતાની નિમણૂક [illegible]

બિનશૈક્ષણિક જગ્યાઓ :

સિનિયર ક્લાર્ક ૨ (બે)

જુનિયર ક્લાર્ક ૧ (એક)

ગ્રંથપાલ ૧ (એક)ની નિમણૂક કરવામાં આવે;

૫. ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચનો આંકડો મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

૬. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;

૭. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમજ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રોવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમજ છૂટા થયેલા શિક્ષકવર્ગના તેમજ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૮. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમજ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-આવશે."

પરિશિષ્ટ"૨૬"

કામકાજ ક્રમાંક ૨ (૨૮)

જૂન, ૧૯૯૭થી જુદી જુદી સંસ્થાઓ તરફથી નવી કૉલેજ શરૂ કરવા અંગે આવેલ અરજીઓ પરત્વે નિયુક્ત કરેલ "જરૂરિયાત નક્કી કરવા" (નીડ કમિટિ) માટેની સમિતિની સભા તા. ૮-૧-૧૯૯૭ના રોજ બપોરે ૩-૩૦ કલાકે યુનિવર્સિટી કાર્યાલયમાં મળી હતી. જેમાં હાજરી નીચે મુજબ હતી :

૧. પ્રો. કે. એસ. શાસ્ત્રી	હાજર
૨. શ્રી ડી. એમ. શીખ	ગેરહાજર
૩. પ્રો. એસ. બી. વોરા	ગેરહાજર
૪. પ્રો. વાય. કે. અગ્રવાલ	હાજર
૫. આચાર્યશ્રી એચ. એમ. દેસાઈ	હાજર

સભાગૃહની સંમતિથી સભાનું પ્રમુખસ્થાન પ્રો. કે. એસ. શાસ્ત્રીએ સંભાળ્યું હતું. ત્યાર બાદ સભામાં નીચે પ્રમાણે કામગીરી હાથ ધરવામાં આવી :

૧. મૅનેજિંગ ટ્રસ્ટીશ્રી, એક્સેલન્સ એજ્યુકેશન મુવમેન્ટ ટ્રસ્ટ, અમદાવાદ તરફથી વાણિજ્ય, વિજ્ઞાન અને ફિઝિકલ એજ્યુકેશનની કૉલેજો શરૂ કરવા અંગે આવેલ અરજી પર વિચારણા કરવા બાબત.

શરૂઆતમાં સંચાલક મંડળની મૅનેજિંગ ટ્રસ્ટીશ્રી અશ્વિનભાઈ શ્રીવાસ્તવ તથા ટ્રસ્ટના અન્ય સભ્યોએ રૂબરૂ રજૂઆત માટે બોલાવવામાં આવ્યાં.

સમિતિએ કૉલેજ શરૂ કરવાના સ્થળ, નાણાકીય પરિસ્થિતિ તેમ જ અન્ય ભૌતિક સુવિધાઓ અંગે સંચાલક મંડળની રજૂઆતો સાંભળી.

ત્યાર બાદ ઠરાવવામાં આવ્યું કે યુનિવર્સિટીએ તેમને લખેલ પત્રમાં જણાવેલ માહિતી અપૂરતી હોવાથી, તેમને જરૂરી માહિતી તાકીદે પૂરી પાડવા જણાવવામાં આવ્યું.

સદરહુ માહિતી આવ્યા બાદ વિચારણા કરવાનું રાખવું.

૨. એસ. એન. ડી. ટી. યુનિવર્સિટી સાથે સંલગ્ન મહિલા મહાવિદ્યાલય, વડોદરા સંચાલિત કૉલેજને આ યુનિવર્સિટી સાથે જોડાણ મેળવવા અંગે આવેલ અરજી પર વિચારણા કરવા બાબત.

શરૂઆતમાં ઉપરોક્ત સંસ્થા તરફથી હાજર રહેલ ઇનચાર્જ આચાર્યશ્રી શાંતિભાઈ પટેલ, માજી આચાર્ય શ્રીમતી ચન્દ્રિકાબહેન પટેલ તથા પ્રાધ્યાપિકા શ્રીમતી ઇન્દિરાબહેન શાહની રજૂઆત સમિતિએ સાંભળી.

ત્યાર બાદ ઠરાવવામાં આવ્યું કે ઉપરોક્ત કૉલેજની સ્થળ પર નીડ સમિતિએ તાકીદે મુલાકાત લઈ અહેવાલ આપવો. અને સદરહુ નીડ સમિતિ પર આમંત્રિત તરીકે એજ્યુકેશન વિદ્યાશાખાના ડીનશ્રી બી. એમ. મોદીને પણ નીમવા.

વધુમાં ઠરાવવામાં આવ્યું કે સમિતિના સભ્યો એકબીજા સાથે પરામર્શ કરી સ્થળ પર જવાની તારીખ નક્કી કરશે.

૩. મંત્રીશ્રી, શિવશક્તિ સ્ટડી સર્કલ, ભૂજ તરફથી વિનયન/વાણિજ્ય વિદ્યાશાખાની મહિલા માટે કૉલેજ શરૂ કરવા આવેલી અરજી પર વિચારણા કરવા બાબત.

ઉપરોક્ત ટ્રસ્ટના સંચાલક મંડળને આજે તા. ૮-૧-૧૯૯૭ના રોજ નીડ સમિતિ સમક્ષ રૂબરૂ રજૂઆત કરવા માટે બોલાવેલ. પરંતુ સદરહુ સંસ્થાના કોઈ પણ હોદ્દેદાર સમિતિ સમક્ષ ઉપસ્થિત થયા નથી. પરંતુ સદરહુ સંસ્થાના ઓનરરી સેક્રેટરીએ તા. ૮-૧-૧૯૯૭ના રોજ યુનિવર્સિટીને લખેલ પત્ર સમિતિ સમક્ષ રજૂ કર્યાં

ત્યાર બાદ ઠરાવવામાં આવ્યું કે સંસ્થાના તા. ૮-૧-૧૯૯૭નો પત્ર ધ્યાનમાં લેતાં એસ. એન. ડી. ટી. યુનિવર્સિટી, મુંબઈ સાથે જોડાણ મેળવવાની જાણ કરી છે તેથી તેઓની કૉલેજ જોડાણ માટેની અરજી પરત્વે નીડ સમિતિએ કંઈ કરવાપણું રહેતું નથી.

૪. મંત્રીશ્રી, શ્રીમતી એસ. એમ. એજ્યુકેશન એન્ડ રિસર્ચ ફાઉન્ડેશન, ખંભાત તરફથી જૂન, [illegible]થી વિનયન અને વાણિજ્ય વિદ્યાશાખામાં માત્ર મહિલા કૉલેજ શરૂ કરવા આવેલ અરજી પર વિચારણા કરવા બાબત.

[illegible] સંસ્થાને તા. ૨૭-૧૧-૧૯૯૬ના રોજ આ સમિતિ સમક્ષ કરેલ રજૂઆત

આથી ઠરાવવામાં આવે છે કે સદરહુ સંસ્થાને તા. ૨૭-૧૧-૧૯૯૬ના રોજ આ સમિતિ સમક્ષ કરેલ રજૂઆત તથા યુનિવર્સિટીને મોકલેલ માહિતી ઇત્યાદિ દસ્તાવેજી પુરાવાઓ જોતાં તેમજ હાલ આ યુનિવર્સિટી સાથે જોડાણ ધરાવતી ખંભાતની આર્ટ્સ, કોમર્સ કૉલેજમાં એફ.વાય. બી.એ.માં મહિલા વિદ્યાર્થીઓની [illegible] તથા એફ.વાય. બી.કોમ.માં ૧૦૧ મહિલા વિદ્યાર્થીઓની સંખ્યા જોતાં આ સંસ્થાએ માત્ર મહિલા કૉલેજ [illegible] નવી કૉલેજ શરૂ કરવાની જરૂરિયાત આ સમિતિને લાગતી નથી. તે અંગે સમિતિ અલગ [illegible] આગળ કાર્યવાહી કરવી.

૫. મૅનેજિંગ ટ્રસ્ટીશ્રી, [illegible] પરિવાર ચેરિટી ટ્રસ્ટ, ચંદ્રાલા, તા. [illegible], જિ. અમદાવાદ [illegible] વિચારણા [illegible] ૧૯૯[illegible]થી માત્ર મહિલાઓ માટે વિનયન વિદ્યાશાખાની કૉલેજ [illegible] કરવા [illegible]

[illegible] ઠરાવવામાં [illegible] છે કે તા. [illegible]-૧૯૯[illegible]ના [illegible] આ સમિતિ [illegible]

રજૂઆત, આવેલ માહિતી ઇત્યાદિ બાબતોને લક્ષમાં લેતાં આ સમિતિને નવી કૉલેજ શરૂ કરવાની જરૂરિ જણાતી નથી.

સદરહુ બાબત અંગે સમિતિ અલગ હેવાલ આપશે.

૬. મંત્રીશ્રી, વકીલ કેશવલાલ મોતીલાલ એજ્યુકેશન સોસાયટી, કઠલાલ તરફથી જૂન, ૧૯૯૭થી વિનય અને વાણિજ્ય કૉલેજ શરૂ કરવા અંગે આવેલ અરજી પર વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે તા. ૨૭-૧૧-૧૯૯૬ના રોજ આ સમિતિ સમક્ષ સંચાલક મંડળના હોદ્દેદારો કરેલ રૂબરૂ રજૂઆત, યુનિવર્સિટીને પૂરી પાડેલ માહિતી, ભૌતિક સુવિધાઓ, નાણાકીય પરિસ્થિતિ ઇત્યાદિ પાસાંઓને લક્ષમાં લેતાં નીડ સમિતિએ તાકીદે સ્થળ પર મુલાકાત લઈ હેવાલ આવે પછી નિર્ણય લેવાનું રાખવું.

વધુમાં ઠરાવવામાં આવ્યું કે સમિતિના સભ્યો એક બીજા સાથે પરામર્શ કરી સ્થળ પર મુલાકાતે જવાની તારીખ નક્કી કરી જાણ કરશે.

૭. એક્ઝિક્યુટિવ સેક્રેટરી, ડૉ. બી. આર. આંબેડકર એજ્યુકેશન સોસાયટી, અમદાવાદ તરફથી ગાંધીનગર ખાતે જૂન, ૧૯૯૭થી વિનયન તેમજ વાણિજ્ય વિદ્યાશાખાની નવી કૉલેજ શરૂ કરવા આવેલ અરજી પર વિચારણા કરવા બાબત.

આથી ઠરાવવામાં આવે છે કે ઉપરોક્ત સંચાલક મંડળે તા. ૨૭-૧૧-૧૯૯૬ના રોજ આ સમિતિ સમક્ષ કરેલ રજૂઆત. યુનિવર્સિટી પાસે પડેલ માહિતી, નાણાકીય પરિસ્થિતિ, ભૌતિક સુવિધાઓ ઇત્યાદિ પાસાંઓ લક્ષમાં લેતાં સમિતિએ સ્થળ પર જઈ તાકીદે મુલાકાત લઈ હેવાલ આપવો. સદરહુ હેવાલ આવ્યા બાદ આગળ કાર્યવાહી કરવાનું રાખવું.

વધુમાં ઠરાવવામાં આવ્યું કે સમિતિના સભ્યો એક બીજા સાથે પરામર્શ કરી સ્થળ પર મુલાકાતે જવાની તારીખ નક્કી કરી જાણ કરશે.

ત્યાર બાદ સભાનું કામકાજ પૂરું થયેલું જાહેર કરવામાં આવ્યું.

પ્રો. કે. એસ. શાસ્ત્રી
અધ્યક્ષ

નીડ સમિતિનો હેવાલ

મેનેજિંગ ટ્રસ્ટીશ્રી શ્રીમતી એસ. એમ. એજ્યુકેશન ઍન્ડ રિસર્ચ ફાઉન્ડેશન, ખંભાત તરફથી જૂન, ૧૯૯૭થી ખંભાત ખાતે નવી વિનયન અને વાણિજ્ય વિદ્યાશાખાની મહિલા કૉલેજ શરૂ કરવા માટે અરજી કરી છે. આ સંદર્ભમાં કુલપતિશ્રીએ નિયુક્ત કરેલ સમિતિની સભા તા. ૮-૧-૧૯૯૭ના રોજ ૩-૩૦ કલાકે મળી હતી.

સમિતિ નીચેનાં કારણોસર નવી કૉલેજને જોડાણ આપવાની ભલામણ કરતી નથી :

૧. ખંભાતમાં જ હાલની આર્ટ્સ ઍન્ડ કૉમર્સના પ્રથમ વર્ષ વિનયનમાં મહિલા વિદ્યાર્થીઓની સંખ્યા ૮૨ અને પ્રથમ વર્ષ વાણિજ્યમાં મહિલા વિદ્યાર્થીઓની સંખ્યા ૧૦૧ છે. અને કૉલેજની બંને વિદ્યાશાખામાં સદરહુ વર્ષમાં પ્રથમ વર્ષમાં કુલ સંખ્યા ૧૮૩ છે. આથી માત્ર મહિલાઓ માટે નવી કૉલેજ શરૂ કરવાની જરૂરિયાત જણાતી નથી.

૨. ખંભાતની હાલની આર્ટ્સ, કૉમર્સ કૉલેજ અને આ માગેલ સંસ્થાની કૉલેજના સ્થળ વચ્ચે જૂજ અંતર છે.

પ્રો. કે. એસ. શાસ્ત્રી
પ્રિ. એચ. એમ. દેસાઈ
પ્રો. વાય. કે. અગ્રવાલ

નીડ સમિતિનો હેવાલ

મંત્રીશ્રી, શ્રી ઉમિયા પરિવાર ચેરિટી ટ્રસ્ટ, મુ. પો. ચંદ્રાલા, તા. દહેગામ, જિ. અમદાવાદ તરફથી જૂન, ૧૯૯૭થી મહિલાઓ માટે વિનયન વિદ્યાશાખામાં નવી કૉલેજ શરૂ કરવા માટેની અરજી કરી છે. આ સંદર્ભમાં નીમેલ નીડ સમિતિની સભા તા. ૮-૧-૧૯૯૭ના રોજ ૩-૩૦ કલાકે મળી હતી.

સમિતિ નીચેનાં કારણોસર નવી કૉલેજને જોડાણ આપવાની ભલામણ કરતી નથી :

૧. ચંદ્રાલાની નજીક તલોદ, પ્રાંતિજ અને હિંમતનગર અને ગાંધીનગરમાં હાલ પૂરતા પ્રમાણમાં વિનયન વિદ્યાશાખાની કૉલેજો છે. ત્યાં વિદ્યાર્થિનીઓને પ્રવેશ માટે પૂરતી તકો રહેલી છે. તેથી સૂચિત નવી મહિલા વિનયન કૉલેજ શરૂ કરવાની તરફેણ કરતી નથી.

૨. ચંદ્રાલા ખાતે માગવામાં આવેલ નવી કૉલેજથી ગાંધીનગર અને હિંમતનગર વચ્ચેનું અંતર માત્ર અંદાજે ૧૫થી ૩૦ કિલોમીટર જેટલું જ છે.

પ્રો. કે. એસ. શાસ્ત્રી
પ્રિ. એચ. એમ. દેસાઈ
પ્રો. વાય. કે. અગ્રવાલ

પરિશિષ્ટ "૨૭"

કામકાજ ક્રમાંક ૨ (૨૯)

એક્સલન્સ એજ્યુકેશન મુવમેન્ટ ટ્રસ્ટ તરફથી કૉમર્સ કૉલેજ શરૂ કરવા અંગેની અરજી પર હેવાલ

એક્સલન્સ એજ્યુકેશન મુવમેન્ટ ટ્રસ્ટ તરફથી અમદાવાદમાં કૉમર્સ કૉલેજ શરૂ કરવા અંગે નિમાયેલ નીડ અને સ્થાનિક તપાસસમિતિના સભ્યો તરીકે અમે આ ટ્રસ્ટ જ્યાં આ કૉલેજ શરૂ કરવા માગે છે તે ભાવિન વિદ્યાવિહારના મકાનની મુલાકાત તા. ૨૭-૧-૧૯૯૭ના રોજ લીધી હતી. આ સમયે એક્સલન્સ એજ્યુકેશન મુવમેન્ટ ટ્રસ્ટના સંચાલકો તેમજ ભાવિન વિદ્યાવિહારના સંચાલકો હાજર રહ્યા હતા. અમારો હેવાલ નીચે પ્રમાણે છે :

અમદાવાદ શહેરમાં કૉમર્સ વિદ્યાશાખામાં અંગ્રેજી માધ્યમ દ્વારા શિક્ષણ મેળવવા માગતા વિદ્યાર્થીઓની સંખ્યા વધતી જાય છે અને શહેરની બધી કૉલેજોની અંગ્રેજી માધ્યમની ક્ષમતા કરતાં પ્રવેશ મેળવવા માગતા વિદ્યાર્થીઓની સંખ્યા વધુ છે. આ સંદર્ભમાં કૉમર્સ વિદ્યાશાખામાં અંગ્રેજી માધ્યમ દ્વારા ભણી શકે તેવી સંસ્થાની જરૂર છે. આ ટ્રસ્ટ ગુજરાતી માધ્યમ દ્વારા પણ શિક્ષણ આપશે, તેવું સંચાલકોએ અમારી સમક્ષ સ્વીકાર્યું છે.

શરૂઆતના એક વર્ષ દરમિયાન આ સંસ્થાએ ભાવિન વિદ્યાવિહારના મકાનમાં કૉલેજ શરૂ કરવાનું સ્વીકાર્યું છે અને ભાવિન વિદ્યાવિહારના સંચાલકોએ આ અંગે અમને લેખિત બાંહેધરી આપી છે.

પહેલાં આ મકાનમાં નિરમા દ્વારા સંચાલિત ઇજનેરી કૉલેજ બેસતી હતી. યુનિવર્સિટીનાં ધારાધોરણો અનુસાર આ મકાનમાં જરૂરી વર્ગખંડો, ટ્યુટોરિયલ ખંડો, લાઇબ્રેરી, અધ્યાપક ખંડ, લેડીઝ રૂમ, કાર્યાલય, આચાર્ય ખંડ, વગેરેની સુવિધાઓ ઊભી કરવામાં આવશે, તેમ સંચાલકોએ અમને જણાવ્યું છે.

આથી ૧૯૯૭-૯૮ના શૈક્ષણિક વર્ષ માટે અંગ્રેજી માધ્યમના એક વર્ગની તેમજ ગુજરાતી માધ્યમના એક વર્ગની પરવાનગી આપવાની અમે ભલામણ કરીએ છીએ, અને ૧૫ જૂન, ૧૯૯૭થી ૧૪ જૂન, ૧૯૯૮ સુધી યુનિવર્સિટીના પ્રવર્તમાન નિયમો અને શરતો અનુસાર આ કૉલેજોને જોડાણ આપવાની ભલામણ કરીએ છીએ.

પ્રો. કે. એસ. શાસ્ત્રી
આચાર્ય ટી. એમ. શીખ
પ્રિ. એચ. એમ. દેસાઈ
પ્રો. શ્રી આર. એચ. વ્યાસ
પ્રો. વાય. કે. અગ્રવાલ

ઍકેડેમિક કાઉન્સિલની ભલામણ

આથી ઠરાવવામાં આવે છે કે એક્સેલન્સ એજ્યુકેશન મુવમેન્ટ ટ્રસ્ટ, અમદાવાદ તરફથી શિક્ષકગણની નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પરિપાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૩૧-૫-૧૯૯૭ સુધીમાં સુધીમાં કરે તો તેને અમદાવાદ ખાતે વાણિજ્ય વિદ્યાશાખા હેઠળ પ્રથમ વર્ષ વાણિજ્યમાં અંગ્રેજી માધ્યમનો એક વર્ગ તથા ગુજરાતી માધ્યમનો એક વર્ગ તારીખ ૧૫-૬-૧૯૯૭થી તારીખ ૧૪-૬-૧૯૯૮ સુધીમાં નવું જોડાણ આપવા એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી.

૧. નીચે મુજબ શિક્ષક-બિનશિક્ષક કર્મચારીઓની નિમણૂક કરવામાં આવે :

	સંખ્યા
ક્રમ શિક્ષક કર્મચારીઓ	૧ (એક)
૧. આચાર્ય	એક એક દરેક વિષય
૨. કૉમર્સ-એકાઉન્ટ, અંગ્રેજી, અર્થશાસ્ત્રના પૂર્ણ સમયના વ્યાખ્યાતા	એક એક
૩. આંકડાશાસ્ત્ર કૉમ્પ્યુટર ખંડ સમયના વ્યાખ્યાતા	૧ (એક)
૪. કૉમ્પ્યુટર પ્રોગ્રામર પૂર્ણ સમયના વ્યાખ્યાતા	૧ (એક)
૫. ગ્રંથપાલ	૧ (એક)
૬. વ્યાયામ શિક્ષક	સંખ્યા
ક્રમ બિનશિક્ષક કર્મચારીઓ	૧
૧. સિનિયર ક્લાર્ક	૨
૨. જુનિયર ક્લાર્ક	કુલ ૧
૩. પટાવાળા, સફાઈ કામદાર, વૉચમેન	

૨. [illegible] મકાનમાં ઓછામાં ઓછી નીચે પ્રમાણેની જોગવાઈ યુનિવર્સિટીના પ્રચલિત ધારાધોરણ પ્રમાણે કરવામાં આવે :

૧. વિદ્યાર્થીદીઠ ૮ ચો. ફૂટ લેખે જરૂરી સંખ્યામાં શૈક્ષણિક દૃષ્ટિએ યોગ્ય તેવા અભ્યાસખંડો;

૨. વર્ગખંડ અને ટ્યુટોરિયલ માટે ખંડમાં જરૂરી ખંડો;

૩. શિક્ષક માટેનો ખંડ-એટેચ્ડ ટોયલેટની વ્યવસ્થા સાથે;

૪. વિદ્યાર્થી માટેનો ખંડ કૉલેજના કુલ વિદ્યાર્થીઓની સંખ્યાના ઓછામાં ઓછા ૧૦ ટકા જેટલા વિદ્યાર્થીઓ બેસી શકે તેવો ખંડ;

૫. વિદ્યાર્થીનીઓની સંખ્યાના ઓછામાં ઓછા ૧૦ ટકા વિદ્યાર્થીનીઓ માટેનો ખંડ (સંલગ્ન શૌચાલય, વગેરે સહિત);

૬. પ્રત્યેક વિદ્યાશાખાના ઓછામાં ઓછા ૧૦ ટકા વિદ્યાર્થીઓ એકસાથે બેસીને વાંચી શકે તેટલી ક્ષમતાવાળો સુસજ્જ વાચન ખંડ સહિત ગ્રંથાલય;

૭. આચાર્ય માટેનો ખંડ-એટેચ્ડ ટોયલેટની વ્યવસ્થા સહિત;

૮. કૉલેજના કાર્યાલય માટેનો ખંડ;

૯. પીવાના પાણી માટેનો ખંડ;

૧૦. શૌચાલય વગેરેની યોગ્ય વ્યવસ્થા;

૩. [illegible] ઓછા પચ્ચીસ વિદ્યાર્થીઓ રહી શકે તેવા છાત્રાલયની જોગવાઈ કરવામાં આવે તથા તેના [illegible] માટે ભાડામુક્ત રહેઠાણની યોગ્ય વ્યવસ્થા કરવામાં આવે;

૪. [illegible] માટે વિદ્યાશાખાદીઠ આવર્તક ખર્ચ નીચે મુજબ કરવામાં આવે :

ક્રમ [illegible]	વિદ્યાશાખાદીઠ
૧. [illegible] માટે	રૂ. ૧૦,૦૦૦
૨. [illegible] માટે	રૂ. ૧,૨૫૦
૩. [illegible]	રૂ. ૧,૨૫૦

૫. [illegible] ૧૦,૦૦૦ ચોરસવાર જેટલા ક્ષેત્રફળના રમતગમતના મેદાનની જોગવાઈ કરવામાં આવે, [illegible] મુખ્ય મકાનની બની શકે તેટલી નજીકમાં ઓછામાં ઓછી ૧,૦૦૦ ચો.વાર જેટલી જગા [illegible] બનાશ.

૬. [illegible] મુજબ આચાર્ય માટે કૉલેજ નજીક ભાડા મુક્ત રહેઠાણની વ્યવસ્થા કરવામાં આવે, [illegible] વ્યવસ્થાપક સમિતિના સભ્ય બનાવવામાં આવે,

૭. યુનિવર્સિટીના ધારાધોરણ મુજબ શિક્ષકોને પગારધોરણ, મોંઘવારી ભથ્થું, ઘરભાડા ભથ્થું તથા પ્રોવિડન્ટ ફંડનો લાભ આપવામાં આવે તથા શિક્ષકોના વાર્ષિક મૂળ પગારના ૨.૫ (અઢી) ટકાના દરે ગ્રેચ્યુઇટી ફંડ [illegible] કરવામાં આવે,

૮. કૉલેજના સંચાલનમાં જે ખાધ થાય તે પૂરી કરવાની સંચાલક મંડળ તરફથી બાંયધરી આપવામાં આવે.

૧૦. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી પ્રવેશ શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી, ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જાતિ તેમજ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત [illegible] યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવશે તે મુજબનું [illegible] બાંયધરી પત્ર આપવાનું રહેશે,

૧૧. [illegible] સ્થાનિક તપાસસમિતિ સાથે અરજકર્તા મંડળના હોદ્દેદાર સાથે થયેલી સ્પષ્ટતા અન્વયે [illegible] (૨) શૈક્ષણિક તથા (૩) બિનશિક્ષકવર્ગના કર્મચારીઓની નિમણૂક માટેના ઓપન [illegible] યુનિવર્સિટી કાર્યાલયમાં રાખવામાં આવે,

૧૨. યુનિવર્સિટીના નિયમાનુસારની પસંદગીસમિતિ ઉપરાંતના સભ્યો પસંદગીસમિતિ ઉપર કુલપતિશ્રી નિયુક્ત કરશે. [illegible] દ્વારા નિયુક્ત થયેલા સભ્યોનાં નામ સંસ્થાને યુનિવર્સિટી પાસેથી મેળવી લેવાનાં રહેશે.

૧૩. [illegible] ૨૦ લાખની (એક રૂપિયા વીસ લાખ પૂરા) ડિપોઝિટ તરીકે યુનિવર્સિટીમાં તા. ૧૦-૫-૧૯૯૭ [illegible] કરાવવાની રહેશે, ત્યારબાદ શરતોને આધીન જોડાણ આપવામાં આવશે. આ ડિપોઝિટ સંસ્થા ગ્રાન્ટપાત્ર ન થાય ત્યાં સુધી યુનિવર્સિટીમાં જમા રહેશે;

૧૪. જોડાણ આપ્યા બાદ કૉલેજ ગ્રાન્ટપાત્ર થાય તેટલા સમયગાળા દરમિયાન જો કૉલેજ તરફથી યુનિવર્સિટીએ નિયત કર્યા પ્રમાણે શિક્ષક-બિનશિક્ષક કર્મચારીની વર્ષના મોટા ભાગ દરમિયાન નિમણૂક કરવામાં આવશે નહીં [illegible] જ્યારે પણ સંસ્થા ગ્રાન્ટને પાત્ર થશે ત્યારે આવી નિમણૂકો નહીં કરીને બચત કરેલ રકમ જેટલી [illegible] અનુદાનમાંથી કપાત કરવાની ભલામણ સરકારને યુનિવર્સિટી કરી શકશે.

પરિશિષ્ટ '૨૮'

કામકાજ ક્રમાંક ૨ (૩૧)

મહિલા મહાવિદ્યાલય (એસ. એન. ડી. ટી.) વડોદરાનું ક્રમશઃ જોડાણ ગુ. યુ.માં આપવા અંગેનો સ્થાનિક તપાસસમિતિનો હેવાલ.

એસ. એન. ડી. ટી., મુંબઈ યુનિ. સાથે સંલગ્ન વડોદરાની કૉલેજ મહિલા મહાવિદ્યાલયે ક્રમશઃ એસ. એન. ડી. ટી. યુનિવર્સિટીમાંથી અલગ થઈ ગુ. યુ. સાથે જોડાણ મેળવવા માટે કરેલ અરજીના સંદર્ભે સમિતિના સભ્યો તરીકે અમો તા. ૧૭-૧-૯૭ના રોજ તે સંસ્થાની રૂબરૂ મુલાકાત લીધી હતી. સંસ્થાના ટ્રસ્ટીશ્રી, આચાર્યશ્રી અને કર્મચારીગણ (શૈક્ષણિક અને બિનશૈક્ષણિક) રૂબરૂ ઉપસ્થિત રહી જરૂરી માહિતી પૂરી પાડી હતી. સંસ્થાના શૈક્ષણિક અને બિનશૈક્ષણિક કર્મચારીઓએ આ પ્રકારે ગુ. યુ.ના જોડાણ અંગે પોતાની સંમતિ આપેલ છે. સદર કૉલેજમાં બે વિદ્યાશાખાઓ વિનયન અને શિક્ષણની (એજ્યુકેશન) છે. નીચેની શરતોએ સદરહુ જોડાણ આપવા ભલામણ છે

૧. શિક્ષણની વિદ્યાશાખાનો અભ્યાસક્રમ એક જ વર્ષનો હોય છે અને જોડાણ ૧૯૯૭-૯૮ના શૈક્ષણિક વર્ષથી માગેલ હોવાથી નીચેની બાબતો અંગે સંસ્થા પાસેથી બાંયધરી લેવી :

૧. ગુજરાત યુનિવર્સિટીમાં શિક્ષણની વિદ્યાશાખામાં કેન્દ્રીય પ્રવેશ સમિતિના નિયમોને આધીન રહી કરવાની રહેશે. આ અંગે સંસ્થામાના શિક્ષકગણ અને પ્રવેશ ક્ષમતાની વિગતો વિષયવાર (મેથડ) કેન્દ્રીય પ્રવેશ સમિતિને તાત્કાલિક પૂરી પાડવી.

૨. ગુજરાત યુનિવર્સિટીનાં ધારાધોરણોનું તે સંસ્થાએ પાલન કરવાનું રહેશે. જેમાં [illegible] આવર્તક ખર્ચ અને અન્ય સગવડોનો સમાવેશ થાય છે.

૩. આવા ફેરફારને (જોડાણ અંગેના) કોઈ શૈક્ષણિક કે બિનશૈક્ષણિક કર્મચારીગીન [illegible]

૨. વિનયન વિદ્યાશાખામાં ક્રમશઃ જોડાણ આપવાનું હોવાથી શૈક્ષણિક વર્ષ ૧૯૯૭-૯૮થી પ્રથમ વર્ષ વિનયનનું જોડાણ નીચેની શરતોએ આપવું :

૧. ગુજરાત યુનિવર્સિટીના અભ્યાસક્રમના માળખા અનુસાર આ સંસ્થાએ માગ્યા મુજબ [illegible] વિષયનું મુખ્ય અને ગૌણ તથા દ્વિતીય ગૌણ વિષયના શિક્ષણ માટેનું જોડાણ આપવું.

(૧. ગુજરાતી (૨) હિન્દી (૩) સમાજશાસ્ત્ર (૪) અર્થશાસ્ત્ર (૫) [illegible]

૨. સંસ્થાએ ઉપર મુજબના માગેલ વિષયના જોડાણ અને ગ્રંથાલયમાં નિયમાનુસારનો આવર્તક ખર્ચ [illegible] વર્ષે કરવાનો રહેશે. (વિષય દીઠ)

૩. જોડાણના આ ફેરફારને કારણે કોઈ પણ શૈક્ષણિક તેમજ બિનશૈક્ષણિક કર્મચારીને [illegible]

૩. જોડાણની પ્રક્રિયા ક્રમશઃ કરવાની હોવાથી શૈક્ષણિક વર્ષ [illegible] દ્વિતીય વર્ષ બી.એ.નું જોડાણ અને [illegible] બી.એ.નું જોડાણ મેળવવા માટે નિયમાનુસારની અરજી [illegible]

આ સંસ્થા ભૌગોલિક દૃષ્ટિએ એમ. એસ. યુનિ., વડોદરાના ક્ષેત્રમાં આવે છે. પરંતુ [illegible] એસ. એન. ડી. ટી. યુનિવર્સિટી [illegible] આ કૉલેજ માટે [illegible] ગુ. યુ. સાથે જોડાણ માટે [illegible] યુનિવર્સિટીમાંથી 'ના વાંધા સર્ટિફિકેટ' મળતો રજૂ કરેલ છે [illegible] આ [illegible] રજૂ કરેલ છે તેથી ઉપર મુજબની જોડાણની કાર્યવાહી [illegible]

પ્રા. કે. એસ. શાસ્ત્રી

શ્રી આર. એમ. વ્યાસ

પ્રિ. બી. એમ. મોદી

[illegible]

પરિશિષ્ટ "૨૯"

કામકાજ ક્રમાંક ૨ (૩૨)

વકીલ કે. એમ. એજ્યુકેશન સોસાયટીની કઠલાલ ખાતે સૂચિત આર્ટ્સ-કૉમર્સ કૉલેજ અંગેનો હેવાલ

ગુજરાત યુનિવર્સિટીના પત્રાંક એકેડેમિક/૭૩૪૧-૪૫ તા. ૨૫-૪-૧૯૯૭ અન્વયે નીચે સમિતિ તરીકે અમે [illegible] સૂચિત કૉલેજની તપાસ માટે કઠલાલ ખાતે તા. ૨૭-૪-૧૯૯૭ના રોજ ગયા. આ કૉલેજ શરૂ થવાની છે [illegible] સ્કૂલની મુલાકાત લીધી હતી. આ મુલાકાત વખતે સદરહુ ટ્રસ્ટના ટ્રસ્ટીશ્રી દીપકભાઈ એસ. પરીખ [illegible] રાજેશભાઈ એન. શાહ અને સંચાલક મંડળના અન્ય સભ્યો પણ હાજર રહ્યા હતા અને અમને જરૂરી [illegible] અને માહિતી પૂરી પાડી હતી. અમારો હેવાલ નીચે પ્રમાણે છે :

કઠલાલથી મહુધા ૧૧થી ૧૨ કિલોમીટર દૂર છે. મહુધા ખાતેની કૉલેજમાં પ્રથમ વર્ષ બી.એ.ના વર્ગમાં [illegible] ૧૫૬ વિદ્યાર્થીઓ છે, જ્યારે પ્રથમ વર્ષ બી.કૉમ.ના વર્ગમાં માત્ર ૪૪ વિદ્યાર્થીઓ છે. આમ આ કૉલેજમાં [illegible] વર્ષ બી.એ., બી.કૉમ.ના વર્ગોમાં હાલમાં વધુ ૨૦૦ વિદ્યાર્થીઓની પ્રવેશની ક્ષમતા છે.

આ ઉપરાંત મહુધા ખાતેની કૉલેજના વિદ્યાર્થીઓની કુલ સંખ્યા માત્ર ૫૪૦ છે જે કૉલેજ માટેની [illegible] સંખ્યા ૧૨૫૦થી ઘણી ઓછી છે.

આ સંદર્ભમાં અમે કઠલાલ ખાતે વિનયન અને વાણિજ્ય કૉલેજની કોઈ જરૂર જોતા નથી, તેથી અમે [illegible] સૂચિત કૉલેજ માટે આ કારણથી ભલામણ કરતા નથી.

પ્રો. કે. એસ. શાસ્ત્રી
પ્રિ. ડી. એમ. શેખ
પ્રો. વાય. કે. [illegible]
પ્રો. આર. એચ. [illegible]
પ્રિ. એચ. એમ. દેસાઈ

પરિશિષ્ટ '૩૦'

કામકાજ ક્રમાંક ૨ (૩૩)

ખેડા આર્ટ્સ ઍન્ડ કૉમર્સ કૉલેજ, ખેડા
જૂન, ૧૯૯૦થી જોડાણ મેળવવા માટેની અરજી પર મૂકેલી શરતોના પરિપાલનનો હેવાલ

ખેડા આર્ટ્સ ઍન્ડ કૉમર્સ કૉલેજ, ખેડાએ આર્ટ્સ વિભાગમાં ગૌણ વિષય તરીકે સમાજશાસ્ત્રના કાયમી જોડાણ માટે કરેલી અરજીના અનુસંધાનમાં નીચેના ત્રણ સભ્યોની ગુજરાત યુનિવર્સિટી પત્રક્રમાંક-એકે ૨૧૨૮૯૬ તા. ૨૩-૫-૯૬ અન્વયે નિમણૂક કરવામાં આવી હતી :

૧. શ્રી ડી. બી. દેસાઈ, સમાજવિદ્યા ભવન
૨. આચાર્યશ્રી, વાડીભાઈ પટેલ, સદ્‌ગુણા સી. યુ. શાહ આર્ટ્સ કૉલેજ ફોર ગર્લ્સ
૩. આચાર્યશ્રી, એ. યુ. પટેલ, એલ. ડી. આર્ટ્સ કૉલેજ.

ઉપરોક્ત સમિતિમાંથી પ્રથમ બે સભ્યોએ તા. ૨૦-૬-૧૯૯૬ના રોજ ખેડા આર્ટ્સ કૉલેજની રૂબરૂ મુલાકાત લીધી હતી, જ્યારે ત્રીજા સભ્ય અન્યત્ર રોકાણોને કારણે હાજર રહી શક્યા નહોતા. આ મુલાકાતમાં જે કોઈ જરૂરી માહિતી હતી તે સામેલ કરેલા પત્રમાં છે. કુલ ૧૨ તાસ માટે પ્રો. એન. પી. વર્માની તા. ૧૫-૬-૧૯૯૫થી તા. ૧૪-૬-૧૯૯૭ સુધીની નિમણૂક કરી છે જે યુનિવર્સિટીના તા. ૧૫-૭-૧૯૯૫ના પત્રના પ્રતિભાવ રૂપે હતી.

અમે ભલામણ કરીએ છીએ કે સમાજશાસ્ત્ર વિષયનાં બીજાં જરૂરી પુસ્તકો ખરીદવાની શરતે અને નીચેની શરતોને આધીન આ કૉલેજે માગેલ જોડાણ આપવું.

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૧. ઑર્ડિ. ૧૨૦ અનુસાર જરૂરી શિક્ષકોની (ખૂટતા)ની નિમણૂક ઉ. શિ. કમિશનર કચેરી, ગાંધીનગરની મંજૂરી મળે ભરવામાં આવશે, શારીરિક શિક્ષણના પૂર્ણ સમયના અધ્યાપક ઉ. શિ. કમિ.ની કચેરી, ગાંધીનગર તથા ગુજરાત યુનિવર્સિટી, અમદાવાદ દ્વારા નિયમાનુસાર કરવામાં આવેલ જે ગ્રંથપાલની નિમણૂક કોર્ટનો સ્ટે હોવાથી હાલમાં કરેલ નથી.
૨. ગ્રંથાલય માટે અત્યાર સુધીમાં શરતોને આધીન કૉલેજના [illegible] [illegible] વર્ષમાં રૂપિયા ૧૩,૮૮૦ રૂપિયાનો ખર્ચ કરવામાં આવ્યો છે. જરૂર જણાય તો વધારે પુસ્તકો ખરીદવામાં આવશે [illegible] ૩ [illegible]નાં પુસ્તકો ખરીદ્યાં છે.
૩. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. [illegible] આવર્તક ખર્ચ કરવામાં આવે.
૪. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તમજ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, પ્રોવિડન્ટ ફંડ, ગ્રેચ્યુઈટી અને ઘરભાડા ભથ્થુ આપવામાં આવે તથા [illegible] શિક્ષકવર્ગના તમજ બિનશિક્ષકવર્ગના કર્મચારીઓને [illegible] [illegible] બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને [illegible] આપવામાં આવે તમજ વિદ્યાર્થીની સંખ્યાને લક્ષમાં [illegible] યુનિવર્સિટીના ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને [illegible] નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે.
૫. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી પ્રવેશ, શિક્ષક બિનશિક્ષકવર્ગના કર્મચારીઓની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને [illegible] સામાજિક અને શૈક્ષણિક રીતે પછાત જાતિ તેમ જ શારીરિક [illegible] જે ધ્યાનમાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોના અમલ કરવામાં આવે [illegible]

ચંદુભાઈ દેસાઈ
વાડીભાઈ પટેલ

પરિશિષ્ટ '૩૧'

કામકાજ ક્રમાંક ૨ (૩૪)

એમ. એસ. ભગત એન્ડ સી. એસ. સોનાવાલા લૉ કૉલેજ, નડિયાદના ડિપ્લોમા ઇન ટેક્ષેશન લૉઝ એન્ડ પ્રેક્ટિસના કાયમી જોડાણ અંગે સ્થાનિક તપાસસમિતિનો હેવાલ

૧. આ કૉલેજ ધી નડિયાદ એજ્યુકેશન સોસાયટી નડિયાદ, દ્વારા ચલાવવામાં આવે છે.

૨. કૉલેજને પ્રથમ વર્ષ, દ્વિતીય વર્ષ તેમજ તૃતીય વર્ષ એલએલ.બી.નું કાયમી જોડાણ મળેલું છે.

૩. ડિપ્લોમા ઇન ટેક્ષેશન લૉઝ એન્ડ પ્રેક્ટિસ (ડી.ટી.પી.) અભ્યાસક્રમ અંગે યુનિવર્સિટીના તા. ૩-૧-૧૯૯૭ના પત્રાંક એકે./૨૧/૩૯૧૫૬/૧૯૯૭થી ચાલુ એડહોક જોડાણ તા. ૧૪-૬- ૧૯૯૭ સુધી મળ્યું છે. જૂન, ૧૯૯૭ના શૈક્ષણિક વર્ષથી ડી.ટી.પી. અભ્યાસક્રમના કાયમી જોડાણ અંગે અરજી કરી છે.

૪. આ કૉલેજમાં અત્યારે પ્રિ. જી. એમ. પટેલ તેમ જ પૂર્ણ સમયના વ્યાખ્યાતા શ્રી વી. આઈ. પટેલ અને ખંડ સમયના વ્યાખ્યાતા શ્રી કે. એમ. પટેલ આ અભ્યાસક્રમમાં શૈક્ષણિક કાર્ય કરે છે. આ સર્વેની નિમણૂક યુનિવર્સિટી તરફથી માન્ય થઈ છે. આ વ્યવસ્થા માગેલ જોડાણના અભ્યાસક્રમ માટે પૂરતી છે.

૫. આ કૉલેજનું પોતાનું પૂરતી સગવડવાળું અલાયદું મકાન છે.

૬. કૉલેજનું સાધનસામગ્રી અને ફર્નિચરવાળું પુસ્તકાલય છે. અભ્યાસક્રમ અનુરૂપ પુસ્તકો તેમ જ ઑલ ઇન્ડિયા રિપોર્ટર, ગુજરાત લૉ રિપોર્ટ, લૉ હેરલ્ડ ઉપરાંત આ પુસ્તકાલયમાં ટેક્ષએવર જેવા ટેક્ષેશન લૉનાં સામયિકો આ પુસ્તકાલયમાં ઉપલબ્ધ છે.

૭. ૧૯૯૨માં ડી.ટી.પી.નો અભ્યાસક્રમ શરૂ થયો ત્યારથી આજ સુધીમાં આ અભ્યાસક્રમમાં ઉત્તરોત્તર વિદ્યાર્થીઓની સંખ્યામાં વધારો થયો હોવાનું જણાયું છે. ઉપરાંત ડી.ટી.પી.માં ઉત્તીર્ણ થયેલ વિદ્યાર્થીઓની સંખ્યામાં પણ [illegible] વધારો થયો છે.

ઉપરોક્ત સમગ્ર બાબતોને ધ્યાનમાં લેતાં તેમજ યુનિવર્સિટી સાથે જોડાયેલી કાયદા વિદ્યાશાખાની આ વિસ્તારની કૉલેજોમાંથી આ એકમાત્ર કૉલેજ છે. જેમાં ૧૯૯૨માં ચાલુ એડહોક જોડાણ મેળવ્યા પછી ડી.ટી.પી.ના અભ્યાસક્રમનું શિક્ષણ યુનિવર્સિટીનાં ધારાધોરણો પ્રમાણે સંતોષકારક રીતે આપવામાં આવે છે. તેથી કમિટી આ કૉલેજને ડી.ટી.પી.ના અભ્યાસક્રમ માટે જૂન, ૧૯૯૭ના વર્ષથી કાયમી જોડાણ આપવાની સર્વાનુમતે ભલામણ કરે છે.

એચ. એસ. પાઠક

એન. કે. પાઠક

સ્થાનિક તપાસસમિતિના સભ્યો.

એકેડેમિક કાઉન્સિલની ભલામણ

આથી ઠરાવવામાં આવે છે કે સી. એસ. સોનાવાલા લૉ કૉલેજ, નડિયાદને નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા.૦૦-૦૦-૧૯૯૭ સુધીમાં કરે તો તેને ડિપ્લોમા ઇન ટેક્ષેશન લૉઝ એન્ડ પ્રેક્ટિસ અભ્યાસક્રમો શીખવવા માટે તા. ૧૫- ૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૯ સુધીનું ચાલુ જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

૧. ઓ. ૧૨૦-એ અનુસાર જરૂરી શિક્ષકગણની નિમણૂક કરવામાં આવે;

ગ્રંથાલય માટે અત્યાર સુધી વખતોવખત મૂકેલી શરતોના સંદર્ભમાં કૉલેજે પોતાના ભંડોળમાંથી કરેલ કુલ ખર્ચના આંકડા મોકલવામાં આવે અને અત્યાર સુધીની શરતોના સંદર્ભમાં ખર્ચ કરવામાં ઊણપ રહેલી જણાય તો તેટલી રકમનાં પુસ્તકોની ખરીદી કરીને તેમ કર્યાની જાણ કરવામાં આવે;

૩. પુસ્તકો અને સામયિકો માટે પ્રત્યેક વિદ્યાશાખાદીઠ પ્રતિવર્ષ ઓછામાં ઓછા રૂ. ૪,૦૦૦નો આવર્તક ખર્ચ કરવામાં આવે;

૪. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થુ, પ્રૉવિડન્ટ ફંડ, ગ્રેચ્યુઇટી અને ઘરભાડા ભથ્થું આપવામાં આવે તથા તેમને તેમ જ છૂટા થયેલા શિક્ષકવર્ગના તેમ જ બિનશિક્ષકવર્ગના કર્મચારીઓને વેતન, વળતર કે અન્ય કાંઈ લેણું ચૂકવવાનું બાકી નથી તેવું પ્રમાણપત્ર આપવામાં આવે અને જો કોઈ લેણું ચૂકવવાનું બાકી હોય તો તે ચૂકવી આપવામાં આવે તેમ જ વિદ્યાર્થીની સંખ્યાને લક્ષમાં લઈ મહેકમ અંગેનાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ બિનશિક્ષકવર્ગના પર્યાપ્ત કર્મચારીઓની નિમણૂક કરવામાં આવે અને મહેકમના સંદર્ભમાં કોઈ નિમણૂક બાકી રહેવા પામી નથી તેવું પ્રમાણપત્ર આપવામાં આવે;

૫. ગુજરાત સરકાર, ભારત સરકાર અને યુ.જી.સી.એ વિદ્યાર્થી-પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુ. જાતિ, અનુ. જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં યુનિવર્સિટીએ વખતોવખત નિયત કરેલ ધારાધોરણોનો અમલ કરવામાં આવે છે-આવશે."

પરિશિષ્ટ '૩૨'

કામકાજ ક્રમાંક ૨(૩૫)

સરદાર પટેલ ઇન્સ્ટિટ્યૂટ ઑફ ટેક્નોલૉજી, વાસદ દ્વારા જૂન, ૧૯૯૭થી ઇજનેરી કૉલેજ શરૂ કરવા માટેની અરજી અંગેની તપાસસમિતિનો હેવાલ

સરદાર પટેલ ઇન્સ્ટિટ્યૂટ ઑફ ટેક્નોલૉજી, વાસદ તરફથી તા. ૩૦-૧૨-૧૯૯૬ના રોજ વાસદ ખાતે એક ઇજનેરી કૉલેજ જૂન, ૧૯૯૭થી શરૂ કરવા માટેની અરજી યુનિવર્સિટીને મળી હતી.

તા. ૫-૭-૧૯૯૭ના રોજ ગુજરાત યુનિવર્સિટીની સમિતિએ ટ્રસ્ટીઓ અને ફાઉન્ડેશનના સભ્યો સાથે આ કૉલેજ તેઓ જે સ્થળે સ્થાપવા માગે છે તે માટેના સૂચિત સ્થળની મુલાકાત લીધી હતી.

સંસ્થાએ મોકલેલ (૧) આ કૉલેજ માટેનો પ્રોજેક્ટ રિપોર્ટ (૨) બિડાણ તરીકે મોકલેલ ગુજરાત રાજ્ય સરકારનું પ્રોવિઝનલ એન.ઓ.સી. સર્ટિફિકેટ (૩) અન્ય માહિતી અને રૂબરૂમાં થયેલ ચર્ચાઓ ઉપરથી સમિતિનો અભિપ્રાય છે, કે ઉચ્ચ શિક્ષણ અને વ્યાવસાયિક શિક્ષણને લગતા કેટલાક સર્વ સામાન્ય મુદ્દાઓ તેમજ આ સંસ્થાને લગતા મુદ્દાઓ નીચે પ્રમાણે છે :

૧. હાલ ગુજરાત યુનિવર્સિટીમાં સંલગ્ન કૉલેજો બે પ્રકારની છે, સરકારી અને અનુદાનપાત્ર બિનસરકારી કૉલેજો. આ સૂચિત નવી વ્યવસ્થામાં કાયમી ધોરણે અનુદાન સિવાયની વ્યાવસાયિક સંસ્થાઓ શરૂ થશે.

૨. સંસ્થાએ ઇજનેરી વિદ્યાશાખા માટેનું કામચલાઉ મકાન ઊભું કર્યું છે.

૩. ફીનું ધોરણ હાલની વ્યવસ્થામાં યુનિવર્સિટી નક્કી કરે છે, આ સૂચિત નવી વ્યવસ્થા ગુજરાત રાજ્ય સરકારના સચિવ, યુનિવર્સિટીના કુલપતિશ્રી, તેમજ ડાયરેક્ટર ઑફ ટેક્નોલૉજી ટેક્નિકલ એજ્યુકેશનની બનેલી સમિતિ વખતોવખત નક્કી કરશે.

૪. ફીનું ધોરણ બે પ્રકારનું રહેશે, ૫૦ ટકા વિદ્યાર્થીઓ માટે બીજી સરકારી કે અનુદાનપાત્ર કૉલેજોમાં પ્રવર્તમાન ધોરણ પ્રમાણે રહેશે, જ્યારે બાકીના ૫૦ ટકા વિદ્યાર્થીઓ માટે ફીનું ધોરણ ઊંચું રહેશે, જેમાં સંસ્થાનો તમામ આવર્તક ખર્ચ ઉપરાંત અનાવર્તક ખર્ચાનો પણ કેટલોક ભાગ સમાવાય તેવી જોગવાઈ. ૧. ૫૦ ટકા બેઠકોને "Free Seat" કહેવામાં આવશે, અને બાકીની ૫૦ ટકા બેઠકો "Payment Seats" રહેશે. બંનેનાં ફીનાં ધોરણોમાં ઘણો મોટો તફાવત રહેશે.

૫. અનામત વિદ્યાર્થીઓના પ્રવેશ અંગે ગુજરાત યુનિવર્સિટીના નિયમો તથા રાજ્ય સરકારના શિક્ષણ વિભાગના તા. ૮-૩-૧૯૯૫ના ઠરાવ ક્રમાંક જીઈસી-૧૦૯૩-એસ તથા વખતોવખત નિયત કરેલા ધારાધોરણો અનુસાર રહેશે.

૬. ફીનાં બે ધોરણોને કારણે સંભવિત આનુષંગિક પ્રશ્નો અને તે માટેની જરૂરી જોગવાઈઓ અંગે વિચારણા કરવી.

ઉપરની સર્વસામાન્ય બાબતો સહિત સમગ્ર યોજનાને ખ્યાલમાં રાખી એકેડેમિક કાઉન્સિલ અને એક્ઝિક્યુટિવ કાઉન્સિલ આ સંસ્થાના જોડાણ અંગે વિચારણા કરી તેમાં નીચેની બાબતોને લક્ષમાં લઈ તેમજ દર્શાવેલ શરતોએ જોડાણની વિચારણા કરવા આ સમિતિ ભલામણ કરે છે :

(૧) એ.આઈ.સી.ટી.ઈ.નાં નૉર્મ્સ અને સ્ટાન્ડર્ડ્ઝ અનુસાર જરૂરી સુવિધાઓવાળા મકાનની (વર્ગખંડ માટે, લૅબોરેટરી માટે, વર્કશૉપ માટે, આચાર્ય માટે, સ્ટાફ માટે ડ્રૉઇંગ રૂમ, ઑફિસ રૂમ, લાયબ્રેરી તથા અન્ય સુવિધાઓવાળા) વ્યવસ્થા તા. ૩૦-૭-૧૯૯૭ સુધીમાં કરવામાં આવે.

(૨) કૉલેજ માટે અન્ય જરૂરી ભૌતિક સાધનો, લૅબોરેટરી, વર્કશૉપનાં જરૂરી ઇક્વિપમેન્ટ્સ, ફર્નિચર [illegible] એ.આઈ.સી.ટી.ઈ.નાં નૉર્મ્સ અને સ્ટાન્ડર્ડ્ઝ મુજબ વસાવવામાં આવે.

(૩) એ.આઈ.સી.ટી.ઈ.નાં નૉર્મ્સ, સ્ટાન્ડર્ડ્ઝ અનુસાર સુવિધાવાળી હૉસ્ટેલની તથા રમતગમત માટેના મેદાન અને સાધનોની વ્યવસ્થા કરવામાં આવે.

(૪) એ.આઈ.સી.ટી.ઈ.નાં નૉર્મ્સ અને સ્ટાન્ડર્ડ્ઝ અનુસાર જરૂરી શૈક્ષણિક અને બિનશૈક્ષણિક કર્મચારીગણની નિમણૂકો કરવાની રહે.

(૫) એ.આઈ.સી.ટી.ઈ.નાં નૉર્મ્સ અને સ્ટાન્ડર્ડ્ઝ અનુસાર કોમ્પ્યુટિંગ ફૅસિલિટીઝ, ગ્રંથાલય અને ગ્રંથાલયમાં પુસ્તકો અને જર્નલોની વ્યવસ્થા કરવામાં આવે.

(૬) યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકોને તેમ જ બિનશિક્ષક વર્ગને પગારધોરણ, મોંઘવારી ભથ્થું [illegible] પ્રૉવિડન્ટ ફંડનો લાભ આપવામાં આવે [illegible] માટે જરૂરી ફંડ [illegible] કરવામાં આવે [illegible] ગ્રેચ્યુઇટી પેન્શન [illegible]

(૭) કૉલેજના સંચાલ[illegible]

(૮) 'ગુજરાત સરકાર, ભારત સરકાર અને એ.આઈ.સી.ટી.ઈ.એ વિદ્યાર્થી પ્રવેશ, શિક્ષક-બિનશિક્ષકવર્ગના કર્મચારીગણની નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુસૂચિત જાતિ, અનુસૂચિત જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમજ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં રાજ્ય સરકારે વખતોવખત નિયત કરેલ ધારાધોરણોનું અમલ કરવામાં આવશે' તે મુજબનો સંસ્થાનો બાંયધરીપત્ર.

(૯) આ યુનિવર્સિટીની સ્થાનિક તપાસસમિતિ સાથે અરજીકર્તા મંડળના હોદ્દેદાર સાથે થયેલી સ્પષ્ટતા અન્વયે (૧) આચાર્યશ્રી (૨) શૈક્ષણિક તથા (૩) બિનશિક્ષકવર્ગના કર્મચારીઓની નિમણૂક માટેના (ઓપન) ઈન્ટર્વ્યૂ યુનિવર્સિટી કાર્યાલયમાં રાખવામાં આવે.

(૧૦) યુનિવર્સિટીના નિયમાનુસારની વરણીસમિતિ ઉપરાંતના સભ્યો વરણીસમિતિ ઉપર કુલપતિશ્રી નિયુક્ત કરશે. કુલપતિશ્રી દ્વારા નિયુક્ત આવા સભ્યોનાં નામ સમસ્થાએ યુનિવર્સિટી પાસેથી મેળવી લેવાનાં રહેશે.

(૧૧) સંસ્થાએ રૂ. ૨૦ (વીસ) લાખની રકમ ડિપોઝિટ તરીકે યુનિવર્સિટીમાં જમા કરાવવાની રહેશે. આ ડિપોઝિટ ઓછામાં ઓછા સાત વર્ષ યુનિવર્સિટીમાં જમા રહેશે.

ઉપરની સુચિત સઘળી શરતો અનુસારની વ્યવસ્થા તા. ૩૦-૭-૧૯૯૭ સુધીમાં સંસ્થાએ કરવાની રહેશે.

પ્રિ. એચ. એમ. દેસાઈ

પ્રિ. વાય કે. અગ્રવાલ

સ્થાનિક તપાસસમિતિના સભ્યો

એકેડેમિક કાઉન્સલની ભલામણ

"આથી ઠરાવવામાં આવે છે કે સરદાર પટેલ ઇન્સ્ટિટ્યૂટ ઑફ ટેકનોલોજી, વાસદ નિમણૂકો અંગેની શરત સહિતની નીચે દર્શાવેલ ૧થી ૧૦ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૩૦-૭-૧૯૯૭ સુધીમાં કરે તે શરતે તેને ઇજનેરી વિદ્યાશાખામાં ફર્સ્ટ ઇયર બી.ઇત્યાદિના નીચે દર્શાવેલ અભ્યાસક્રમો (સહિત વિદ્યાર્થી સંખ્યા) શીખવવા માટે.

ક્રમાંક અભ્યાસક્રમો (બ્રાન્ચ)	વિદ્યાર્થી સંખ્યા
૧. કેમિકલ એન્જિનિયરિંગ	૬૦
૨. મિકેનિકલ એન્જિનિયરિંગ	૬૦
૩. ઇલેક્ટ્રિકલ એન્જિનિયરિંગ	૬૦
૪. સિવિલ એન્જિનિયરિંગ	૬૦
૫. ઇલેક્ટ્રોનિક્સ એન્ડ કૉમ્યુનિકેશન	૬૦
કુલ	૩૦૦

તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૮ સુધીનું નવું જોડાણ આપવામાં આવે છે.

૧. એ.આઈ.સી.ટી.ઈ.નાં નોર્મ્સ અને સ્ટાન્ડર્ડ્ઝ અનુસાર જરૂરી સુવિધાઓવાળા મકાનની (વર્ગખંડો માટે, લેબોરેટરી માટે, વર્કશૉપ માટે, આચાર્ય માટે, સ્ટાફ માટે ગર્લ્સ રૂમ, બોયઝ રૂમ, ટોયલેટ્સ તથા અન્ય સુવિધાઓવાળા) વગેરે વ્યવસ્થા તા. ૩૦-૭-૧૯૯૭ સુધીમાં કરવામાં આવે.

૨. કૉલેજ માટે જરૂરી ભૌતિક સાધનો, લેબોરેટરી, વર્કશૉપ માટેનાં જરૂરી ઇક્વિપમેન્ટ્સ, ફર્નિચર વિગેરે. એ.આઈ.સી.ટી.ઈ.નાં નોર્મ્સ અને સ્ટાન્ડર્ડ્ઝ મુજબ વસાવવામાં આવે.

૩. એ.આઈ.સી.ટી.ઈ.નાં નોર્મ્સ, સ્ટાન્ડર્ડ્ઝ અનુસાર જરૂરી સુવિધાઓવાળી હૉસ્ટેલની તથા રમતગમત માટેના મેદાન અને સાધનોની વ્યવસ્થા કરવામાં આવે.

૪. એ.આઈ.સી.ટી.ઈ.નાં નોર્મ્સ અને સ્ટાન્ડર્ડ્ઝ અનુસાર જ જરૂરી શૈક્ષણિક અને બિનશૈક્ષણિક કર્મચારીગણની નિમણૂકો કરવાની છે.

૫. એ.આઈ.સી.ટી.ઈ.નાં નોર્મ્સ અને સ્ટાન્ડર્ડ્ઝ અનુસાર કૉમ્પ્યુટિંગ ફેસિલિટીઝ, ગ્રંથાલય અને ગ્રંથાલયમાં પુસ્તકો અને જર્નલ્સોની વ્યવસ્થા કરવામાં આવે.

૬. યુનિવર્સિટીનાં ધારાધોરણ મુજબ શિક્ષકોને તેમજ બિનશિક્ષક વર્ગના કર્મચારીઓને પગારધોરણ, મોંઘવારી ભથ્થું, ઘરભાડા ભથ્થું તથા સિટી કૉમ્પનસેટરી એલાવન્સ તથા પ્રોવિડન્ટ ફંડનો લાભ આપવામાં આવે તથા શિક્ષક તેમજ બિનશિક્ષક વર્ગના કર્મચારીઓ માટે વાર્ષિક મૂળ પગારના પાંચ ટકાના દરે ગ્રેચ્યુઈટી/પેન્શન અને અન્ય નિવૃત્તિના લાભો માટે જરૂરી ફંડ ઊભું કરવામાં આવે.

૭. કૉલેજના સંચાલનમાં જે ખર્ચ થાય તે પૂરી કરવાની સંચાલક મંડળ તરફથી બાંયધરી આપવામાં આવે.

૮. ગુજરાત સરકાર, ભારત સરકાર અને એ.આઈ.સી.ટી.ઈ. મુજબ વિદ્યાર્થીપ્રવેશ, શિક્ષકવર્ગના કર્મચારીગણની

નિમણૂક, ભરતી, બઢતી ઇત્યાદિ અંગે અનુસૂચિત જાતિ, અનુસૂચિત જનજાતિ અને બક્ષીપંચ દ્વારા આવરી લેવાયેલ સામાજિક અને શૈક્ષણિક રીતે પછાત જ્ઞાતિ તેમ જ શારીરિક ખોડખાંપણ ધરાવતા ઉમેદવારોની અનામત જગ્યા ભરવામાં સરકારનાં વખતોવખત નિયત કરેલ ધારાધોરણનો અમલ કરવામાં આવશે. તે મુજબનો સંસ્થાનો બાંયધરીપત્ર.

૯. આ યુનિવર્સિટીની સ્થાનિક તપાસસમિતિ સાથે અરજીકર્તા મંડળના હોદ્દેદાર સાથે થયેલી સ્પષ્ટતા અન્વયે (૧) આચાર્યશ્રી (૨) શૈક્ષણિક તથા (૩) બિનશિક્ષક વર્ગના કર્મચારીઓની નિમણૂક માટેના (ઓપન) ઈન્ટર્વ્યૂ યુનિવર્સિટી કાર્યાલયમાં રાખવામાં આવે.

૧૦. યુનિવર્સિટીના નિયમાનુસાર વરણી સમિતિ ઉપરાંતના સભ્યો વરણીસમિતિ ઉપર કુલપતિશ્રી નિયુક્ત કરશે, કુલપતિશ્રી દ્વારા નિયુક્ત આવા સભ્યોનાં નામ સંસ્થાએ યુનિવર્સિટી પાસેથી મેળવી લેવાનાં રહેશે.

૧૧. સંસ્થાએ રૂ. ૨૦ (વીસ) લાખની રકમ તા. ૨૫-૭-૧૯૯૭ સુધીમાં ડિપોઝિટ તરીકે યુનિવર્સિટીમાં જમા કરાવવાની રહેશે. આ ડિપોઝિટ ઓછામાં ઓછાં સાત વર્ષ યુનિવર્સિટીમાં જમા રહેશે.

૧૨. સંસ્થાએ ઇજનેરી વિદ્યાશાખા માટેનું નવું મકાન એ.આઈ.સી.ટી.ઈ.ની ભલામણ મુજબની સુવિધાવાળુ બે વર્ષમાં તૈયાર કરવાનું રહેશે.

૧૩. આ સાથે સામેલ તપાસસમિતિના હેવાલની ભલામણ ક્રમાંક ૩, ૪, ૫ અને ૬ અનુસાર કાર્યવાહી કરવાની રહેશે.

પરિશિષ્ટ '૩૩'

કામકાજ ક્રમાંક ૨ (૩૬)

નં. એકેડેમિક(બી) ૮૦૧૭૧/૧૯૯૭
ગુજરાત યુનિવર્સિટી કાર્યાલય,
અમદાવાદ-૯. તા. ૧૧-૯-૧૯૯૭

પરિપત્ર ૨૮ :

યુનિ. સાથે સંલગ્ન વાણિજ્ય વિદ્યાશાખાની સર્વે કૉલેજોના આચાર્યશ્રીઓને આ કાર્યાલયના પરિપત્ર ક્રમાંક-૫ એકેડેમિક/બી ૩૧૨૪૦, તા. ૨૦-૨-૧૯૯૬ના અનુસંધાનમાં જણાવવાનું કે ફર્સ્ટ બી.કૉમ.ના ફરજિયાત એકાઉન્ટન્સી અને વૈકલ્પિક એડવાન્સ્ડ એકા. એન્ડ ઑડિટિંગના નીચે મુજબના સુધારા કરવામાં આવ્યા છે જેનો અમલ જૂન, ૧૯૯૭થી કરવામાં આવે છે :

(I) 'એકાઉન્ટન્સી (ફરજિયાત)'

Para 2–Should be read as follows :

"Preparing subsidiary books from given vouchers, posting to ledger accounts from subsidiary books and preparation of trial balance therefrom (in case of a newly started business only.)"

(II) 'એડવાન્સ્ડ એકાઉન્ટિંગ એન્ડ ઑડિટિંગ પે. ૧'

"Notes (1) & (2) given at the end of the prescribed syllabus for "Advanced Accounting & Auditing P-I" at F.Y.B.Com. are replaced by the following note

"The paper to be set the University examination should cover questions testing conceptual knowledge through objective and short questions (at least one question from each section) and should also cover at least two full length questions from each section"

એસ. ડી. સ્વામિનારાયણ
ઇ. રજિસ્ટ્રાર

પરિશિષ્ટ "૩૪"

કામકાજ ક્રમાંક ૨ (૩૭)

Revised Syllabus of B.E. (Chem. Rubber & Plastic)

(In force from Sept., 1997)

TEACHING AND EXAMINATION SCHEME

B.E. II Semester (III & IV) (Chem.Rub.Pl)

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
301	Inorganic Chemistry	4	4	100	3	50	25	25	200
302	Fluid flow operations	3	4	100	3	50	25	25	200
303	Material Sci. & Tech.	3	1	100	3	50	-	-	150
304	Computer Programming	3	4	100	3	50	25	25	200
305	Applied Maths.-II	4	-	100	3	50	-	-	150
		17	13	500	-	250	75	75	900

Semester IV

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
401	Physical Chemistry	3	3	100	3	50	25	25	200
402	Organic Chemistry	4	3	100	3	50	25	25	200
403	Chemical Pro. Inds.-I	3	3	100	3	50	25	25	200
404	Process Calculations	4	1	100	4	50	-	-	150
405	Proc. Heat Transfer	3	3	100	3	50	25	25	200
		17	13	500	-	250	100	100	950

Note : B.E.II Sem III & Sem IV are common for Chemical, Plastic & Rubber.

TEACHING AND EXAMINATION SCHEME

B.E.III Sem V (Plastic)

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
501	Principles of Thermodynamics	3	1	100	3	50	-	-	150
502	Inj Molding Technologies	3	3	100	3	50	50	25	225
503	Principles of Poly. Sci	3	3	100	3	50	50	25	225
504	Basic Plastic Processing	3	4	100	3	50	50	50	250
505	Plastic Engg Hyd.&Pneu	3	4	100	3	50	50	50	250
506	Industrial Training	-	-	-	-	-	-	-	-
		15	15	500	15	250	200	150	1100

B.E.III Sem. VI (Plastic)

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
601.	Plastic Extr. Technologies	4	4	100	3	50	50	25	225
602.	EDPM	3	-	100	3	50	—	—	150
603.	BASIC Plastic Tech.	3	3	100	3	50	50	25	225
604.	Plastic Test. & Identification	3	4	100	3	50	50	50	250
605.	Plastic Recy. & Waste Treat.	3	3	100	3	50	50	50	250
606.	Industrial Training	-	-	-	-	-	-	-	-
		16	14	500	15	250	200	150	1100

In-Plant Training of 6 / 8 weeks during vacation of Semester V & VI

TEACHING AND EXAMINATION SCHEME

B.E.IV Sem. VII (Plastic)

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
701.	Polymer Reaction Engineering	3	2	100	3	50	25	25	200
702.	Advance Pl. Processing	3	3	100	3	50	25	25	200
703.	Ad. Plastic Tech.	3	3	100	3	50	50	50	250
704	Plastic Equ. Product Design	3	3	100	3	50	50	50	250
705.	Plastic Eng. Safety & QM	3	-	100	3	50	-	-	150
706	Seminar	4	-	-	-	-	25	25	50
*707.	Industrial Training	-	-	-	-	-	25	25	50
		15	15	500	15	250	200	200	1150

* Evalution of training taken during V and VI semester.

B.E.IV Sem. VIII (Plastic)

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
801.	Plastic Alloys &Blends	3	3	100	3	50	50	25	225
802.	Pl.Pr.Ins. & Proc. Con.	3	3	100	3	50	50	25	225
803.	Comp.Prog. & Auto CAD in Pl. Eng.	3	3	100	3	50	50	25	225
804	FRP Tech	3	3	100	3	50	50	25	225
805	Project	-	6	-	-	-	100	50	150
		12	18	400	12	200	300	150	1050

301. Inorganic Chemistry

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	4	100	3	50	25	25	200

1. Atomic structure : Bohr's theory H atom.Wave mechanics, schrodinger wave equation Quantum Nos distribution of electrons.
2. Periodic table : Modern periodic law and long form periodic table. Periodic tends in size, atomic radii Ionic radii. Electron affinity etc.
3. Nature of Chemical bonding : Ionic, co-valent, co-mote nate bond, and its properties V.B and M.O Theory, Hydridization & resonancer, electron pair repulsion theory. H-bond vander waal forces.
4. Metallurgical processes and metals : principles involved in concern of ores, extraction refining and physical-Chemical properties of Iron, Steel Ti, Al, Cu, Th, Uranium, Ni, Zn and Ind application.
5. Chemistry of Non-Transitional elements : H,N, P, S. and its compound.
6. Chemistry of complex salt : Werner's Co-ordination theory, isomerism complex, Chelation stability of complex. Theory of Co-ordinate bond in metal complex.
7. Inorganic reactions : Dissociation, addition, free radicals, substitution, exchange reactions and its mechanisms, oxi-red. reaction. Organometallic compounds and Inorganic polymers.

Practical Term-work :

Volumetric analysis : Preparation of standard solution. Acid-base,oxi-red., Orgentometric, complexo metric titration, Iodometric titration. Determination of Mn from pyrolusite.

Gravimetric analysis : Determination of Fe, Ni, SO and Cl, analysis of Iron-alloy.

Preparation : (a) Chrome-Alum (b) Potash-Alum (c) Micro-cosmic salt (d) Cuprous chloride etc.

Books :

(1) Advanced Inorganic Chemistry - By Cotton & Wilkinson.
(2) Inorganic Chemistry - By Gilrith
(3) Inorganic Chemistry - By P.I Soni

302. Fluid Flow Operations

Teaching Scheme		Examination Scheme					
Th	Tu pr	Theo marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	4	100	3	50	25	25	200

Nature of fluid fluid statics, transport properties, boundary layer; drag force, mass velocity average velocity; potential flow; streamlines etc

Reynold number and its significance, laminar and turbulent flow;

Equation of continuity, Bernoulli's equation, frictional losses in channels, Measurement of flow. Transportation of fluids, pumps, its characteristics and pump design; pipe fittings; fluid moving machinery, flow passed bodies, aerodynamics. Settling of solids, two phase gas-liquid flow in pipes.

Dimensional Analysis.

Practical and Term-work :

Experiments based on metering devices such as venturimeter, orificemeter, rotameter etc.

Experiments based on Characteristics of pumps, fans, compressors etc

Experiments based on measurements of pressure drops.

Study experiments on laminar and turbulent flow visualization.

Books :

1. Unit Operations of Chemical Engineering- W.L Mccabe and J.C. Smith.
2. Chemical Engineering Vol I- Coulson and Richardson.
Fluid Dynamics and Heat Transfer- Knudson and Katz.

303. Material Science and Technology

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	1	100	3	50	0	0	150

1. Engg Materials: classification,structure of solids, complex structures-polymorphism, amorphours and partly crystalline structures.
2. Phase Transformations & Phase Equilibria: phase transitions-solid solutions and intermetallic compounds, phase rule, cooling curves, phase equilibrium diagrams for solid solutions, phase transformations, phase equilibrium diagrams for alloy systems like steel,Cu-Zn,Cu-Sn,Cu-Ni, Cu-Ag,Cu-Al,Al-Si,Ni-Cr etc.,Non-equilibrium cooling, Time-temp. transformations and continous cooling transformations for alloys ,heat treatments for alloys .
3. Polymers: Thermosetting and Thermoplastic polymers, structure property relationship in polymers, elastomers, polymer processing and reprocessing.
4. Corrosion : Importance for chemical Engg., classification of different types ,basic mechanisms of corrosion, polarisations, factors influencing corrosion-environmental and internal factors, passivity.
5. Corrosion control & prevention: Protection by design, inhibitors ,corrosion resistance of ferrous, copper, aluminium,nickel,titanium, lead etc. and their alloys in diferent conditions with effect of different alloying elements.
—Cathodic protection
—Anodic protection
—Protective materials:corrosion resistant coatings,linings & cladding with types, techniques & applications.
6. Engg. Materials For Chemical Process Industries.
-applications in different conditions for low carbon & low alloys steels, cast iron , stainless steel,nickel & alloys, copper & alloys, Al & alloys, Titanium & alloys, lead, glass, polymers, rubbers & elastomers, carbon & graphite etc
7. Selection of materials for chemical industries
(a) Analysis of requirements , (b) Selections of class of materials
(c) Value analysis & final selections.
8. Recent trends in Chemical Engg. materials & composites

Books :

1. Nature and properties of Engineering Materials- D Zester Zebski
2. Engineering Physical Metallurgy- Yu Lakhtin
3. Elements of material science- Van Wale
4. The Science and Engineering of Materials- Donald R. Askland

304. Computer Programming

Teaching Scheme		Examination Scheme					
Th	Tu pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	4	100	3	50	25	25	200

1. Introduction to computers computer languages like machine language and high level language, hardware terms etc.
2. Programming with Basic,C or other advanced developed languages with development of flow charts and algorithms.
3. Problems in process design. mathematical models for simple processes, programs for flowsheet, material and energy balances calculations
4. Chemical Engg. application of software etc. The above topics should be discussed with respect to its application for chemical engg. and allied industries Chemical Engg problems should be discussed.

Books :

1. Computer primer- D.Rajaraman and V Rajaraman
2. Computer Today D.H. Sanders
3. Computer and common sense- R. Hunt and J. Shelly
4. Programming in ANSI C by E. Balaguruswamy OR Gottfried
6. Programming in Basic by E. Balaguruswamy OR Gottfried

Applied Mathematics—II

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr. Oral marks	Term work	Total marks
4	—	100	3	—	—	—	100

1. **Fourier Series :** Periodic functions. Dirichlet's conditions. Fourier series. Euler's formulae. Fourier expansion of periodic functions with period 2π. Fourier series of even and odd functions. Fourier series of periodic functions with arbitrary periods. Half range Fourier series. Harmonic analysis
2. **Laplace Transforms :** Motivation. Definition. Linearity property. Laplace transforms of elementary functions. Shifting theorem Inverse Laplace transforms. Laplace transforms of derivatives and integrals. Convolution theorem. Application of Laplace transforms in solving ordinary differential equations. Laplace transforms of periodic. Unit step and Impulse functions
3. **Ordinary Differential Equations :** Linear differential equations of higher order with constant coefficients. Method of variation of parameters. Higher order linear differential equations with variables coefficients (Cauchy's and Legendre forms). Simultaneous linear differential equations. Models for the real world problems and their solutions in particular. Modelling of electric circuits. Deflection of beams. Free oscillations. Forced oscillations. Resonance. Solution of Bessel and Legendre equations by series method. Definition and properties of Bessel's functions. Legendre's polynomials and properties like recurrence relations, orthogonality
4. **Partial Differential Equations :** Formation of Partial differential equations. Directly integrable equations. Models of Engineering problems leading to first order partial differential equations. Lagrange's equation, Solutions of special type of first order partial differential equations. Homogeneous linear equations with constant coefficients. Applications of partial differential equations. Boundary value problems and method of seperation of variables. Modelling of vibration of a streched string–one dimensional wave equation
5. **Numerical Methods :** Motivation. Errors. Trunction error. Rounded off error. Absolute error. Relative error and Percentage error. Solution of algebraic and transcendental equations [illegible] Newton-Raphson Bisection. False position and extended iteration methods. Convergence of these methods.

Reference Books

1	Dr B S Grewal	Higher Engineering Mathematics. Khanna Publishers. New Delhi
2	Prof Wartikar & Wartikar	Engineering Mathematics - Vol. I, II. Pune Vidyarthi Griha, Pune.
3	Dhavan & Shrivastav	Engineering Mathematics. Danpat Rai & Sons. New Delhi.
4	S S Sastry	Engineering Mathematics-Vol. I & II. Printice Hall of India. New Delhi.
5	P D S Verma	Mathematics for Engineering Students. Kalyani Publishers. Ludhiyana & Delhi
6	N P Bali. Ashok Saxena & Iyengar	A Text Book on Engineering Mathematics. Laxmi Publication (P) Ltd.. New Delhi.
7	Kandasamy. Thilagavathi & Gunavathi	Engineering Mathematics Vol. I, II, III S Chand & Co. (Pvt.) Ltd.. New Delhi.
8	Chandrika Prasad	(1) A First Course in Mathematics for Engineers. (2) Mathematics for Engineers. (3) Advanced Mathematics for Engineers. Prasad Mudranalaya, 7 Veli Avenue. Allahabad
9	Kumbhojkar. G V	Engineering Mathematics Vol. I, II, III, IV. C Jamnadas & Co. Bombay.
10	Majumdar. [illegible]	Engineering Mathematics Vol. I New Central Book Agency (P) Ltd., 8/1 Chintamani Das Lane. Calcutta
11	Erwin Kreyszig	Advanced Engineering Mathematics (Fifth Edition). Wiley Eastern Ltd . New Delhi

401. Physical Chemistry

Teaching Scheme		Examination Scheme					
Th	Tu/Pr	Theo. marks	hr	Sess marks	Pr Oral marks	Term work	Total marks
3	3	100	3	50	25	25	200

1. Chemical Kinetics: Rate of Reaction - Effect of time concentration etc on the rate of reaction Order and molecularity - Methods of determination of order of reaction - Pseudo unimolecular - Zero order reaction
2. Phase rule (statement and definition) Application of phase rule to one component system (water and sulfur) Two component system. solid-liquid system (Eutectic compound solid solution formation Liquid-Liquid system (miscible and immiscible) Solvent extraction Fractional distillation. Distillation (azeotripic and azeotropic systems) Deviation of Gibbs Phase rule Simple three components system Application of phase rule to solid-liquid and Liquid-Liquid system
3. Thermodynamics - First law of thermodynamics Application to compressor and expansion of gases Second law of Thermodynamics concept of entropy Third law of thermodynamics entropy change in compressor, expansion chemical reaction and mixing

   Concept of free energy criteria from spontanery of reaction Gibbs Hemholtz partial molal properties Chemical potentials concept of activity and fugacity Criteria for phase equilibrium Gibbs-duhem equation

   Introduction to statistical and thermodynamics Maxwell Boltzmann distribution partial functions Entropy and free energy function Sackur-Tetrode equation
4. Thermochemistry - Standard heat of formation. Standard Free energy of formation Variation heat of reaction and free energy change of reaction with temperature and pressure
5. Electro chemistry - Laws of electrolysis. Electrolstic Measurement and application of transport number Ionic mobility strong and weak electrolyte Interionic attraction theory Debye-Huckle theory concept of ph, buffer solutions Concept of acidity and basicity

   Electromotive force. Electrolytic and galvanic cells types of electrodes and electrode reactions determination of standard E M F electrode oxidation potential reversible electrode and half cell reactions
6. Surface Chemistry - Absorption and chemisorption. Absorption isotherms Surface area of solids absorption from solution Chemisorption and Catalysis
7. Colloids - Classification and properties of colloids emulsions detergents miscellaneous gels foams Aerosol Industrial applications

Practical and Term work :

Practical work based on (i) chemical kinetics (ii) Thermo chemistry (iii) Surface chemistry (iv) Instrumental [illegible] of chemical analysis [illegible]

Books

(i) Physical chemistry Samuel Glastone
(ii) Text on physical chemistry "A J Mee"
(iii) Physical chemistry Bahl & Tuli
(iv) Physical chemistry P L Soni & Dharma

402. Organic Chemistry

Teaching Scheme		Examination Scheme					
Th	Tu/pr	Theo marks	hr	Sess marks	Pr Oral marks	Term work	Total marks
4	3	100	3	50	25	[illegible]	200

1. Organic reactions and their Mechanisms Types of bond ionization types of reactions and their mechanism
2. Alkenes Geometrical isomerism Markowniko rule anti markowniko rule Types of dienes and [illegible] Polymerization
3. Alkyl halides SN [illegible] reactions 1 and 2 [illegible] reagents and their importance

4. Stereochemistry : Stereochemistry of compounds having two asymmetric carbon atoms Walden inversion etc
5. Carboxylic acid : Mechanism of esterification and hydrolysis Tantomerism. Preparation of ethyl acetoacetic ester and importance in organic synthesis.
6. Chemistry of organic compounds such as Chloroform, carbon tetrachloride, ethyalalcohol, methyalalcohol, acetone, Acetic anhydride, Formaldehyde, acetic acid, EDTA etc.
7. Petrochemicals : Chemicals derived from petroleum products-Methane, Ethylene, Propane, etc.
8. Carbohydrates : Carbohydrates and classifications stru & Chemical reactions of Glucose, Fructose, & Starch, etc.
9. Synthetic applications and reaction Mechanism of following reactions-Alchohol, Canizaro, Stobe, Perkin, Reformatsky, Michael, Dieckmann, Welf-kishaner, Lucard reactions,
10. Preparation, Properties and reaction mechanism of follarj-Anyl halde, Nitrobenzene, Aromatic amine, Pheners aromatic sulfuric and carboxylic acids, Diazocompounds and importance.

 Polynuclear aromatic compounds : Chemistry of Naphthalene. and their derivatives.

 Chemistry of Heterocyclic compounds - Contains five membered and six membered rings.

 Aromatic compounds and aromacity Huck's rule. Structure of Benzene. Aromatic substituti on electrophilic and Nuoteophilic reactions and their mechanism.

Practical and Term-work

Identification of organic compounds.
Estimation of organic compounds
Determination of saponification, Iodine, acid and ester value
Determination of Equivalent weight of an organic acid.
Separation of purification of Binary organic mixtures.
Preparation of some organic compounds
(1) Acetanilide (2) Dinitro benzene (3) Azo dye etc

Books

(1) Organic Chemistry Vol I & II by I.L Finar
(2) Organic Chemistry-Ha[illegible]son and [illegible]
(3) [illegible] Organic Chemistry by Jerry March
(4) Organic Chemistry : by P L Soni

403. Chemical Process Industries - I

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo marks	hr	Sess. marks	Pr /Oral marks	Term work	Total marks
	3	100	3	50	25	25	200

1. Water : Water treatment for industrial and domestic use such as demineralisation, [illegible], desalination, reverse osomosis. Sewage water and inds. waste water treatment and disposal management
2. Fuels and Combustion Types of fuels proximate analysis, ultimate analysis, Cocking and distillation of coal, hydrogenation of coal, properties of fuels, alternatives availability, furnace and burner design, [illegible]
3. Energy and its alternate sources. Liquid and gaseous fuels, water gas, producer gas, forms and sources of energy. Nuclear energy, molecular reaction. Energy from unconventional sources such as solar energy, bio-mass, wind energy, OTEC etc.
4. Oils, Fats, Waxe. Soaps and detergents. Vegetable oils, soyabean oil by extraction, Animal fats, processing of animal fats and oils. Hydrogenation, Waxes, Detergents, Raw materials

 Manufacture of detergents, detergency, biodegradability of surfactants, fatty acids, Soaps, Glycerin.
5. Sulfur and Sulfuric acid Mining of sulfur, manufacture of Sulfur and sulfuric acid by contact and DCDA process, its applications

 Manufacturing [illegible] processes, properties, application, state of art with respect to [illegible] and use pattern for all above industry/products should be [illegible] used.

Practical and Term-work:

Experiments based on the above topics for the testing, identification, analysis and preparations etc should be given to the students.

Books :

1. Sherve's Chemical Process Industries- George Austin
2. Outlines of Chemical Technology- Charles Dryden
3. General Chemical Technology- Shukla and Pandey

404. Process Calculations.

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	1	100	4	50	-	-	150

1. Dimensions and units : Dimensions and system of units, Fundamental and derived units, Dimensional consistancy, Dimensional equations, Different ways of expressing units of quantities and physical constant.
2. Basic chemical calculations : Camposition of gaseous mixtures, liquid mixtures, solids etc. Ideal gas laws and its application. Dalton law, Raoult's law, Henry's law, solubility and distribution coefficient humidity and saturation.
3. Material balance without chemical reactions : Process flowsheet, Material balance with and without recycle; Bypass, Purge streams, Material around equipments related unit operations like absorber and stripper, Distillation towers, Exractors, Dryers, Evaporators, Crystallizers, Humidification and dehumidification towers. Material balance of unsteady state operations like mixing (system consisting of gases, gas-liquid, gas-solid, liquid-liquid, liquid-solid, solid-solid should be covered)
4. Material balance with chemical reactions : Concept of limiting and excess reactants, precentage conversion and yield etc., material balance involving reaction with special reference to fertilizers, petrochemicals, dyestuffs, electochemical industries (system cosisting of gaseousgas-liquid, gas-solid, liquid-liquid, solid-liquid, solid-solid should be covered)
5. Energy balances : Heat capacity of gases and gaseous mixtures, liquids & solids, Sensible heat change in liquid & gases, enthalpy changes during phase transformation, enthalpy changes accompained by chemical reactions, thermo-chemistry of mixing process, dissolution of solids etc. Liquid-liquid mixtures, heat of solution by partial molal quantities. Energy balance for systems with and without chemical reactions, Energy balance for nuclear, electrochemical, photochemical & biochemical processes.
6. Fuels and combustion : Types of fuels, calorific value of fuels, problems on combustion of coal, liquid fuels, gaseous fuel, sulphur and sulphur pyrites etc. Proximate and ultimate analysis, combustion calculations, theoretical flame temp. etc.
7. Plant utilities : Estimation of the requirement of steam, electricity, water, compressed air, vacuum etc
8. Typical industrial applications : Material and energy balance of industrial processes such as manufacturing alkviated, cement, fertilizers, effluent treatment systems etc

Text books :

1. 'Stoichiometry' I. Bhatt & S. M. Vora, McGraw Hill ltd, 1976
2. Chemical process principles Part-I O. A. Hougen, K. M. Watson, John Wiley and asia Publication, 1970

Reference Books :

1. 'Stoichiometry' for chemical engineers', Williams & Johnson, McGraw Hill, Kogakusha ltd
2. 'SI Units in chemical engineering and Technology', D. Wenkateshwarlu, Chemical engineering education development centre, IIT.
3. 'Chemical engineering calculations' S. D Shukla, G N Pandya, Lion press, Kanpur

405. Process Heat Transfer

Teaching Scheme		Examination Scheme						
Th	Tu pr	Theo marks	hr	Sess marks	Pr. Oral marks	Term work	Total marks
3	3	100	3	50	25	25	200

1. **Introduction to three modes of heat transfer :** Conduction convection & radiation General laws of heat transfer.

2. **Conduction :** Fourier's law Conductivity, its variation with temp. & pressure and its relationship with electrical conductivity.

   Heat transfer through composite walls and cylinders

   Unsteady state heat transfer through some important shapes.

   Insulating materials general properties & application.

3. **Natural convection :** Natural convection from vertical plates & horizontal cylinders.

   Forced convection In laminar flow - Heat transfer in plate & in tubes. In turbulent flow. Empirical equations for individual coefficients inside tubes, outside tubes, outside bundle of tubes, flow past spheres

   Significance of Prandtl No., Nusselt No., Grashof No.,Graetz No. & Peclet No

   Correction for tube length. Correction for heating and cooling and other corrections. Various analogies between heat & momentum transfer.

4. **Radiation :** Radiation laws like Stefan Boltzman's law, Kirchoff's law, Wien's law, Plank's law etc Black body, Grey body Transmittivity, Absorptivity, Reflectivity, Emissivity of black bodies and grey bodies Application of thermal radiation Radiation Transfer between surfaces Radiation through semi transparent materials.

5. **Heat transfer with phase change :** Boiling of liquids condensation of vapor Filmwise & dropwise condensation Weighted LMTD & Overall Heat transfer Coefficient for desuperheating & subcooling

6. **Evaporation :** Performance of tubular evaporator. Individual & overall coefficients. Capacity & economy of evaporators Boiling point elevation, Duhring's rule. Effect of liquid head & friction on pressure drop. Types of evaporators

   Multiple effect evaporators

   Vapor recompression-Thermal recompression & mechanical recompression.

7. **Heat Exchange equipments :** Double pipe heat exchangers.

   Individual and overall heat transfer coefficient LMTD Variable overall Heat transfer coefficient fouling factors

   Shell & tube heat exchangers . LMTD correction factors. General constructions.

   Extended surface equipment. Fin efficiency. Fin effectiveness. Calculations of overall heat transfer coefficient for extended surface heat exchangers.

   -Agitated vessels

   Scrapped surface exchangers

   - Heat transfer through fluidized beds

8. **Industrial furnaces.**

Text books :

1. "Heat Transmission" W. H. McAdams, McGraw Hill, 3rd Edition.
2. "Process Heat Transfer" D. Q. Kern, McGraw Hill
3. Fundamentals of Heat Transfer". M. Mikheyev, Mir Publications.

Reference Books :

1. Unit operation of Chemical Engineering". W. L. McCabe and J. C. Smith, McGraw Hill, 3rd Edition, 1976
2. "Principles of unit operation" A. S. Foust et al, Wiley International, 1960.

Practical and Termwork :

Experiments related to conduction convection, radiation, evaporation, industrial furnaces etc.

P 501. PRINCIPLES OF THERMODYNAMICS

Teaching Scheme		Examination Scheme						
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	1	100	3	50	-	-	150

1. **Introduction :**

   Conservation of energy and first law of thermodynamics, application to steady state flow process, enthalpy, internal energy, equilibrium state, phase rule, irreversible vs reversible process, heat capacity and specific heat.

2. **Properties of pure substances :**

   PVT behaviour of pure substances, ideal and non-ideal gases, equation of states, Virial, Van der Waals, Berthelot equ.etc. Calculation of constants in terms of Pc, Tc, Vc, Condition to be satisfied by any equation of state, reduced forms of equations of state, principles of corresponding states.

3. **Heat effects :**

   Heat capacities of gases as a function of temperature, Heat capacities of gases, liquids and solids, Concept of Cpm, Heat of vaporization, Heat of fusion, Heat of sublimation, Heat of formation, Laws of thermochemistry, Heat of combution, kHf from k Hc, kHc from kHf etc., thermoneutrality of salt solution, Heat formation of ions and atoms, Heat of solution, Heat of formation of compound in solution, Heat of solution of hydrate,Heat of mixing and enthalpy concentration diagrams.

4. **Second Law of thermodynamics :**

   Second law of thermodynamics,Thermodynamic temperature scale Ideal gas temperature scale, Concept of entropy, entropy change and irreversibility. Introduction to third law of thermodynamics.

5. **Thermodynamic properties of fluids :**

   Network of thermodynamic equations, mathematical relations among thermodynamic functions Maxwell relations, Interrelations between H, S, G, E, Cp, Cv etc in terms of PVT relation (exhaustive treatment),Thermodynamic properties of single phase and two phase systems, Effect of temperature and pressure, on various properties and their evaluations, Types of thermodynamic diagrams, generalized correlations of thermodynamics properties of ideal gas mixtures

6. **Thermodynamics of flow process .**

   Fundamental equations and relationships flow in pipes, maximum velocity in pipe flow nozzles, Single and Multistage compressors, ejectors

7. **Refrigeration and liquifaction :**

   Carnot refrigeration cycle. Air refrigeration cycle, Vapour compression cycle Absorption refrigeration, Heat pump liquefication processes Refrigeration through solar energy

Text Books

1. Introduction to chemical engineering thermodynamics , J.M. Smith and H.C. Van Ness [illegible] McGraw Hill Co
2. [illegible] Thermodynamics",M Kh Karapetyants, Mir Publishers
3. Chemical Engineering Thermodynamics", B.F. Dodge McGraw Hill
4. "Thermodynamics of Chemical Engineers", H.C. Weber and H.P. Meissner [illegible]

BE III SEM V (PLASTICS)

P-502 INJECTION MOULDING TECHNOLOGIES

Teaching Scheme		Examination Scheme						
Th.	Tu/pr.	Theo marks	hr	Sess marks	Pr. Oral marks	Term work	Total marks
[illegible]	[illegible]	100	3	50	[illegible]	[illegible]	[illegible]

1. INTRODUCTION

   INJECTION MOULDING. MACHINE TYPES PROCESS DESCRIPTION & VARIABLES APPLICATIONS

B MACHINE : HOPPER; CYLINDERS WITH MATERIAL OF CONSTRUCTION; NOZZLES' TYPES LIKE STANDARD, NEEDLE TYPE SHUT OFF NOZZLE, NYLON NOZZLE. SCREWS WITH MATERIAL OF CONSTRUCTION;FUNCTION AND DESCRIPTION OF TERMS LIKE SCREW FLIGHT, CHANNEL DEPTH, LAND WIDTH, L/D RATIO, COMPRESSION RATIO; SCREW TIPS OF VARIOUS TYPES LIKE PLAIN SCREW TIP, RING TYPE NONM RETURN VALVE; SCREW DRIVES LIKE HYDRAULIC AND ELECTRICAL, INJECTION END SPECIFICATIONS; CLAMPING SYSTEMS LIKE HYDRAULIC AND TOGGLE: THEIR COMPARISON, APPLICATIONS IN INJECTION MOULDING MACHINES, ADVANTAGES AND LIMITATIONS; CONTROLS IN INJECTION MOULDING MACHINES.

C PROCESS : SCREW CONVEYING-BASIC PRINCIPLES, SCREW CONVEYING CONSIDERATIONS; RAW MATERIAL SELECTION CRITERIA; EFFECT OF PROCESS VARIABLES ON PRODUCT; ORIENTATION AND ITS IMPORTANCE IN MOULDING, MEASUREMENT AND CONTROL OF ORIENTATION; HOW ORIENTATION CAN BE USED TO ADVANTAGE; NONORIENTED CONDITIONS AND INTERNAL STRESSES; TROUBLE SHOOTING IN DETAIL : SHRINKAGE, WARPAGE, SHORT SHOTS, ETC.

D STRUCTURAL FOAM INJECTION MOULDING : DESCRIPTION OF PROCESS; RAW MATERIAL SELECTION CRITERIA : RESINS, FOAMING AGENTS, ETC. CHANGES REQUIRED IN THE CONVENTIONAL MACHINES; MOULDS TYPES; APPLICATIONS.

E SANDWICH INJECTION MOULDING : METHODS; PROCESS DESCRIPTION IN DETAIL. MACHINE MODIFICATIONS; PROCESS VARIABLES; ADVANTAGES AND LIMITATIONS; APPLICATIONS.

F GAS INJECTION MOULDING : WHY THIS PROCESS; COMPARISON OF PRODUCTS TO BLOW MOULDING; RAW MATERIAL SELECTION CRITERIA; MACHINE REQUIREMENTS; VARIABLES AND THEIR EFFECT ON PRODUCT.

G REACTION INJECTION MOULDING :

(i) DEFINITION. VARIOUS TERMS IN RIM, REQUIREMENTS, RAW MATERIAL AS MONOMERS LIKE POLYOLS, POLYESTER, ISOCYNATES, CHEMISTRY OF MONOMERS. CHEMICAL SYSTEM. CONCEPT OF EQUIVALENT WT.

PRE POLYMERS HDROXYL ANALYSIS, INDEX, ADDITIVES AND AUXILIARY MATERIALS LIKE SURFACTANTS, CATALYST, ADDITIVES, EXPANDING AGENTS, WATER, HARDER, CROSSLINKERS, STORAGE AND HANDLING OF POLYOLS AND ISOCYNATES.

ADVANTAGES AND LIMITATIONS AS COMPARED TO CAST URETHANE TECHNOLOGY. COMPARISON WITH INJECTION MOLDING, APPLICATIONS.

(ii) PROCESS : FORMULATIONS, SELECTION OF PROCESS, PROCESS STEPS IN DETAIL FROM STORAGE TO SHIPMENT, PROCESS VARIABLES AS MAT, PROCESS, POLYMER PROPERTY, INDEX, DENSITY, POST CURING, ADVANTAGES & DISADVANTAGES.INSTRUMENTATION & CONTROL, GAS LOADING, MEASURING THE GAS LOADING & FILLERS, PROCESS CONTROL. STRUCTURE OF MICRO CELLULAR PARTS, PROCESS ADV. & DISADV., DIMENSIONAL CHARACTERISTICS OF RIM PARTS, REINFORCED RIM ELASTOMERS, OTHER RIM PROCESSES LIKE NYRIM ETC., SUMMARY OF FIATURE OF RIM PROCESS. APPLICATIONS IN VARIOUS FIELDS, PU LIKE RIGID & SOFT FOAMS.

(iii) MACHINE : BASIC MACHINE TYPES. CHARACTERISTICS OF IDEAL MACHINE, BASIC COMPONENTS OF RIM MACHINE WITH AUXILIARY EQUIPMENTS. DESCRIPTION & FUNCTION OF INDIVIDUAL COMPONENTS OF RIM MACHINE LIKE METERING UNITS WITH DIFFERENT TYPES OF PUMPS.

MIXING UNIT AS SCREW MIX HEAD & INJECTION MIX HEAD & COMPOUNDS AS MONOMER TANKS, LIQUID LEVEL CONTROLLERS, AERATION, BACKUP PUMPS, FILLERS, DRIVE MOTORS, SHUT OFF CONTROLLERS, PRESSURE GAUGES, HOSES, AUTOMATIC CALIBRATION & CLAMPING UNIT WITH CLASSIFICATION AS UNIVERSAL CLAMP DESIGN. INTRODUCTION OF COLOR ADDITIVES IN RIM MACHINE & HEAD/LAY.

H. INJECTION BLOW MOULDING : INTRODUCTION; PURPOSE OF DEVELOPMENT; ADVANTAGES AND LIMITATIONS; PROCESS IN DETAIL; RAW MATERIAL SELECTION CRITERIA; MACHINE TYPES WITH RECENT DEVELOPMENTS; PROCESS VARIABLES, ETC.

I. INJECTION MOULDING OF THERMOSETS : INTRODUCTION–MOLDING MACHINE DETAILS–COMPRESSION WITH INJECTION MOLDING OF THERMOPLASTICS – PROCESS STEPS – PROCESS ADVANTAGES AND LIMITATIONS AND REMEDIES – CONTROLS – DEVELOPMENT IN MACHINES, CONTROLS, ETC.

TEXT BOOKS :

– INJECTION MOULDING THEORY AND PRACTICE BY I. RUBIN
– INJECTION MOULDING M/C BY WHEELER
– PLASTICS METERIAL AND PROCESSES BY SCHWARTZ AND GOODMAN
– PLASTICS ENGG. HANDBOOK BY JOEN FREDOS
– REACTION INJECTION MOLDING : WALTER BACKER
– FUNDAMENTALS OF RIM : CRISTOPHER W. M., HANSER PUBLICATIONS

REFERENCES :

– INJ. MOULDING HANDBOOK BY ROSATO & ROSATO

BE III SEM V (PLASTICS)
(503) BASIC PLASTICS TECHNOLOGY

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	50	25	225

1. CRYSTALLINITY IN POLYMERS : INTRODUCTION : CRYSTALLINE SOLIDS & THEIR BEHAVIOR TOWARDS X-RAYS-POLYMERS & X-RAY DIFFRACTION-DEGREE OF CRYSTALLINITY & ITS MEASUREMENT-POLYMER CRYSTALLIZATION-CRYSTALLISABILITY-CRYSTALLITES DETERMINATION OF CRYSTALLITES SIZE STRUCTURAL REGULARITY & CRYSTALLISABILITY-FACTORS AFFECTING CRYSTALLISABILITY- SPERULITES FOLDING OF CHAIN DURING CRYSTAL FORMATION.

   EFFECT OF CRYSTALLINITY ON PROPERTIES OF POLYMERS
2. FEED STOCK OF POLYMERS : NAPHTHA-LIQUEFIED PETROLEUM GAS-ETHYLENE-PROFYLENE-CRACKING OF NAPHTHA-UREA-AMMONIA ETC.
3. MONOMER PRODUCTION FOR POLYMERS : ACRYLONITRILE-ETHYLENE-PROFYLENE-STYRENE-BUTADIENE-VINYL CHLORIDE-CELLULOSE-ACETATE USED TO PRODUCE THERMOPLASTS & THERMOSETS.
4. THERMOPLASTICS : MANUFACTURING PROCESSING CHARACTERISTIC, PROPERTIES, APPLICATIONS OF-LOW DENSITY POLYETHYLENE (LDPE), HIGH DENSITY POLYETHYLENE (HDPE), CROSS LINKED POLYETHYLENE (XLPE), ULTRA HIGH MOLECULAR WT. POLYETHYLENE (UHMWPE), HIGH MOL. WT. POLYETHYLENE (HMHWPE), POLYSTYRENE (PS), POLY VINYLCHLORIDE (PVC), PVA, P[illegible] ACRYLICS, CELLULOSE ACETATE.
5. THERMOSETS : MANUFACTURING PROCESSING DETAIL-PROPERTIES-APPLICATIONS OF - UF, PF, MF, EPOXY RESINS SUCH AS PU/ SILICONES ETC

   MATERIAL SELECTION CRITERIA FOR INDUSTRIAL PRODUCTS
6. CONSUMPTION & FUTURE PROSPECTS & SCENARIO OF PLASTICS

REFERENCE BOOKS :

1. PLASTIC MATERIALS : J. A. BRYDSON
2. POLYMER SCIENCE : GOWARIKAR
3. UNIT PROCESS IN ORGANIC SYNTHESIS : P. H. GROGGINS
4. POLYMER MATERIAL SCIENCE : J. M. SCHULTZ
5. AN INTRODUCTION TO POLYMER PHYSICS : I. PERE[illegible]

B.E III SEM V(PLASTICS)

P-504 BASIC PLASTIC PROCESSING I

Teaching Scheme		*Examination Scheme*					
Th.	*Tu pr*	*Theo. marks*	*hr*	*Sess. marks*	*Pr. Oral marks*	*Term work*	*Total marks*
3	4	100	3	50	50	50	250

1 INTRODUCTION : WHAT IS PLASTIC PROCESSING - INTRODUCTION TO VARIOUS PROCESSING METHODS FOR THERMOPLASTICS AND THERMOSETS. CONSIDERATION FOR SELECTION OF PARTICULAR METHOD OF PROCESSING - FLOW BEHAVIOR OF POLYMER MELTS.

2 COMPRESSION MOLDING : INTRODUCTION - TYPES OF PROCESSES : UPSTROKING, DOWNSTROKING - MATERIALS USED AND SELECTION CRITERIA - PREHEATING - BULK FACTOR - PERFORMANCE - PROCESS STEPS - PROCESS ADVANTAGES AND DISADVANTAGES - PROCESS VARIABLES - MOLDING MACHINE DETAILS - MOLD TYPES : FLASH, SEMI POSITIVE, POSITIVE - CHARGING - POST CURING - COOLING FIXTURES - FINISHING - MOLDING DEFECTS , CAUSES AND REMEDIES

3 TRANSFER MOLDING : INTRODUCTION : TRANSFER MOLDING PROCESS TYPES - TECHNIQUES OF TRANSFER MOLDING : POT AND PLUNGER TYPES - ADVANTAGES AND DISADVANTAGES - PROCESS VARIABLES - MOLDING VARIABLES - TYPES OF MOLDS - POT DIMENSIONS AND ITS EFFECTS - TROUBLE SHOOTING - COMPRESSION WITH COMPRESSION MOLDING.

4 INJECTION MOLDING OF THERMOPLASTICS : INTRODUCTION TERMINOLOGY USED IN THE PROCESSING INDUSTRIES FOR MACHINERY - MOLDING MACHINE TYPES - MACHINE CONSTRUCTION IN DETAIL - INJECTION, [illegible] AND CONTROL - INJECTION SIDE DETAILS : SCREENS, SCREW [illegible] TYPES, BARREL, DRIVE MOTOR, HEATING ME[illegible] - CLAMPING SIDE DETAIL : HYDRAULIC, TOGGLE, COMBINED HYDRAULIC [illegible] TOGGLE [illegible] ADVANTAGES AND DISADVANTAGES - CONTROLS - PROCESS VARIABLES - FEEDING SYSTEMS - MOLDING CYCLE DIAGRAM - PRESSURE-TEMP DIAGRAM - MOLDING MATERIALS AND SELECTION CRITERIA - MACHINE SPECIFICATIONS AND MACHINE SELECTION CRITERIA - TROUBLE SHOOTING - RHEOLOGY IN INJECTION MOLDING PROCESS - DEVELOPMENTS IN MACHINE CONTROLS, MOLDS ETC.

5 INJECTION MOLDING OF THERMOSETS : INTRODUCTION - MOLDING MACHINE DETAILS - COMPRESSION WITH INJECTION MOLDING OF THERMOPLASTICS - PROCESS STEPS - PROCESS ADVANTAGES AND LIMITATIONS AND REMEDIES - CONTROLS - DEVELOPMENT IN MACHINES CONTROLS, ETC

TEXT BOOKS

- INJECTION MOULDING THEORY AND PRACTICE BY I. RUBIN
- INJECTION MOULDING M/C BY WHEELER
- PLASTICS METERIAL AND PROCESSES BY SCHWARTZ AND GOODMAN
- PLASTICS ENGG HANDBOOK BY JOEN FREDOS

REFERENCES :

- INJ MOULDING HANDBOOK BY ROSATO & ROSATO.

B.E III SEM V (PLASTIC TECHNOLOGY)

P-505 PLASTIC ENGINEERING HYDRAULICS AND PNEUMATICS

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr*	*Theo marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
	4	100	3	50	50	50	250

I. ON-OFF HYDRAULICS :

(A) GENERAL HYDRAULICS : INTRODUCTION - PASCALS LAW - ADVANTAGES AND DISADVANTAGES OF HYDRAULIC SYSTEMS - REQUIREMENTS OF HYDRAULIC OIL - MAINTENANCE OF HYDRAULIC OILS : HEAT EXCHANGES, FILTERS AND STRAINERS ETC. - RESERVOIR DESIGN CRITERIA - PRINCIPLE HYDRAULIC JACK - PIPES, PACKING AND SEALS.

(B) HYDRAULIC PUMPS AND MOTORS : VARIOUS TYPES OF PUMPS AND MOTORS - SELECTION CRITERIA FOR A SPECIFIC APPLICATION - WORKING PRINCIPLES AND PERFORMANCE.

(C) HYDRAULIC VALVES : TYPES - CLASSIFICATION - DETAILS OF PRESSURE CONTROL - FLOW CONTROL - DIRECTIONAL CONTROL VALVES - PRINCIPLES OF OPERATION - APPLICATION IN MOLDING MACHINES.

(D) ACCUMULATORS AND PRESSURE INTENSIFIERS : TYPES - ADVANTAGES AND LIMITATION - APPLICATIONS.

(E) SYMBOLS FOR HYDRAULIC ELEMENTS AND VARIOUS TYPES OF HYDRAULIC CIRCUITS.

II. PROPORTIONAL HYDRACULICS, DIFFERENCES WITH ON-OFF HYD. VALVES-CIRCUTES ETC.

BOOKS :

- IND. HYDRAULICS MANUAL BY VICKERS
- HYDRAULICS VOL. 1 & 2 BY REXROTH

B.E.III SEM VI (PLASTICS)

P-601 PLASTIC EXTRUSION TECHNOLOGIES

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	4	100	3	50	50	25	225

1. EXTRUSION :

(A) INTRODUCTION:PROCESS-ADVANTAGES AND LIMITATIONS-MACHINES.

(B) PROCESS : DESCRIPTION-MANUFACTURE OF PIPES, FILMS,SHEETS, CABLES AND WIRES, MONOFILAMENT, NETS ALOMG WITH LINE DIAGRAM IN DETAIL; PROCESS VARIABLES IN EACH OF THESE PROCESSES: TROUBLE SHOOTING.

(C) RAW MATERIALS : SELECTION CRITERIA BASED ON MFI, SURFACE CHARACTERISTICS, ETC; GRADES FOR VARIOUS APPLICATIONS LIKE PIPES, FILMS, MONOFILAMENT, ETC.

(D) MACHINE : DRIVE SYSTEMS LIKE MOTORS:VARIOUS TYPES AND SELECTION CRITERIA;REDUCTION GEAR BOXES AND TYPES LIKE WORM WHEEL, HELICAL, ETC;HOPPER AND DESIGN FEATURES; WATER COOLING AT HOPPER; SCREW AND BARREL ASSEMBLIES; VARIOUS TYPES OF SCREWS FOR DIFFERENT APPLICATIONS, BREAKER PLATE AND SCREEN PACKS; DIES : STRAIGHT THROUGH, CROSSHEAD, OFFSET, POST EXTRUSION EQUIPMENTS LIKE COOLING TANK, CORONA TREATERS, TAKE OFFS, STATIC CHARGE ELIMINATERS, GEAR PUMPS IN PIPE LINES, SIZING EQUIPMENTS IN PIPE LINES, MONOFILAMENT LINES, GODETS, WINDERS, TAKE OFF AND CUTTING EQUIPMENTS, ETC.

2 EXTRUSION BLOW MOULDING : INTRODUCTION-MACHINE TYPES-PROCESS DESCRIPTION IN DEATIL-APPLIACTIONS-LIMITATIONS-ADVANTAGES-RAW MATERIALS AND SELECTION CRITERIA-WHY PET CANNOT BE EXTRUSION BLOW MOULDED-PROCESS VARIABLES AND THEIR IMPORTANCE-TROUBLE SHOOTING.

3. THERMOFORMING INTRODUCTION-DEFINITION-VARIOUS PROCESS STEPS. TYPES OF MATERIALS-ADVANTAGE AND DISADVANTAGE WITH THE INJECTION MOLDING PROCESS-TYPES OF MACHINE ,MOLDS AND ITS MATERIAL IN BRIEF-VARIOUS PROCESS VARIABLES-COLD FORMING- PROCESS WITH ADVANTAGE AND DISADVANTAGE-TROUBLE SHOOTING FOR THE PROCESS-RHEOLOGY,ITS IMPORTANCE AND APPLICATION.

BOOKS

-PLASTICS EXTRUSION TECHNOLOGY BY HENSEN

-POLYMER EXTRUSION BY RAUWENDAAL

-THERMOFORMING BY THRONE.

BE III SEM VI (PLASTICS)

P-602 ENTREPRENEURSHIP & PROJECT MANAGEMENT

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr. Oral marks*	*Term work*	*Total marks*
3	-	100	3	50	-	-	150

A. **ENTREPRENEURSHIP :**

1. ASSESSING ENTR. APTIDUTE.
2. FINDING THE RIGHT IDEA.
3. INVESTIGATING FRANCHISE BUSINESS.
4. KNOWING YOUR COMPETITION.
5. CREATING AMARKETING PLAN
6. DETERMING PRICES
7. EFFECTIVE PROMOTION STRATEGIES
8. FINANCING A SMALL BUSINESS
   -INITIAL CAPITALISATION
   -UNDERSTANDING INVESTMENT RISK
   -FINANCIAL STATEMENTS.
9. MANAGING YOUR SMALL BUSINESS.
   -COMPUTER APPLICATION.
   -MANAGEMENT ASSISTANCE.
10. LEGEL CONSIDERATION.
11. LOOKING AHEAD
   -YOUR FUTURE AS AN ENTER.
   -SMALL BUSINESS TRENDS.
   -FINAL THOUGHTS.
   -FINAL EXEMINATION.
   -TOMMOROWS ENTER.
12. EXECELLENCE THROUGH CREATIVITY.
   -THE CREATIVITY PROCESS, CREATIVE PERSONALITY, CREATIVE INTELLEGENCE, CREATIVITY TRAINING

B. PROJECT MANAGEMENT :

1. PRODUCT AND MARKET
   -MARKET STUDY, MARKET DEMAND, MARKET SURVEY, ANALYSIS FOR DATA
   -NEW PRODUCTS, EXCESSIVE ANALYSIS.
2. PRODUCTION PROCESS AND LOCATION SELECTION
   -TECHNICAL FEASIBILITY, PLANT SIZE SELECTION, MANUFACTURING PROCESS, PLANT AND MACHINERY, PLANT LAYOUT,PLANT LOCATION, MANPOWER, UTILITY ELECTRICITY,WATER ETC. REQUIREMENT.
3. PROJECT COST & MEANS OF FINANCE.
   -FINAL STEP, [illegible] VIABILITY WORK, PROJECT COST-CONCEPT AND SIGNIFICATION, PROJECT COST COMPUTITION, SOURCES OF FUNDS

SUBSIDY, DEBT-EQUITY RATIO, CAPACITY UTILIZATION AND INCOME ESTIMATES, PROFIT STATEMENTS AND TAX COMPUTATION, DEBT SERVICE-COVERAGE RATIO, PROFITIBLITY INDICATATORS, CASH FLOW ESTIMATES, CASH FLOW PROJECTION, RISK ANALYSIS, BREAK EVEN ANALYSIS, SENSITIVITY ANALYSIS, FINANCIAL VIABILITY.

4. IMPLEMANTATION SCHEDULE.
   -INTRODUCTION, MAZOR CONSIDERATION IN IMPLIMANTATION SCHEDULE, ILLUSTRATION FOR IMPLEMANTATION SCHEDULE, STATURY CLEARENCES, COMMON ERRORS IN BUSINESS PLAN FORMULATION

BOOKS & REFERENCES :

1. PRACTICE OF ENTREPRENEURSHIP BY MEREDITH AND NECK PUB. BY INTERNATIONAL LABOUR OFFICE GENEVA.
2. INNOVATION & ENTREPRENEURSHIP BY PETER F DRUCKER, PUB BY HEINEMANN,LONDON.
3. ENTREPRENEURSHIP-BY JAMES W.HALLORAM PUB BY MCGRAW-HILL INC.
4. EXECELLANCE THROUGH CREATIVITY BY PRADIP N. KHANDWALA PUB WILLER PUB., ALLHABAD.
5. HOW TO SUCCESS IN SMALL INDUSTRY-RAM K. VEPA, VIKAR PUBLISHING HOUSE.

B. E. III SEM VI(PLASTICS)

P-603 BASIC PLASTICS TECHNOLOGIES

Teaching Scheme		*Examination Scheme*					
Th	*Tw/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	25	225

1. INTRODUCTION : BASIC CONCEPTS-WHAT ARE POLYMERS-HOW ARE THEY MADE-NATURAL & SYNTHETIC POLYMERS-FORMS OF POLYMERS-COPOLYMERIZATION.

2. MOLECULAR WEIGHT ANDS SIZE : INTRODUCTION-MOL.WT. AVERAGES-MOL. WT. DISTRIBUTION OF MOL.WT.-MOL.WT. & PHYSICAL PROPERTIES-SECONDARY VALENCY FORCES. MOL. WT. & DEGREE OF POLYMERIZATION-POLYDISPERSITY & MOL. WT. DISTRIBUTION IN POLYMERS-PRACTICAL SIGNIFICANCE OF POLYMER MOL. WT.-SIZE OF POLYMER MOLECULES

3. GLASS TRANSITION TEMP. (Tg) : WHAT IS GLASS TRANSITION TEMP ?-GLASSY SOLIDS & GLASS TRANSITION -TRANSITION &ASSOCIATED PROPERTIES-FACTORS INFLUENCING THE Tg-MOL.WT.& Tg -PLASTICIZERS & Tg -Tg OF COPOLYMERS-MELTING POINT & Tg.-IMPORTANCE OF Tg & HDT

4. STEREOCHEMISTRY OF POLYMERS INTRODUCTION-CONFIGURATION AND CONFIRMATION FEATURES-SAW HORSE & NEWMANN PROJECTIONS-CONFORMATION OF n-BUTANE-SHAPE OF POLYMER MOLECULES-TACTICITY GENERAL REMARKS ON POLYMER MICRO STRUCTURE-MICRO STRUCTURES BASED ON THE CHEMICAL STRUCTURE

5. TYPES OF POLYMERIZATION
   (A) ADDITION POLYMERIZATION : INTRODUCTION - ADDITION POLY - KINETICS AND MECHANISM OF FREE RADICAL ADD. POLY - DEPENDENCE OF RATE ON THE INITIATOR AND MONOMER CONCENTRATION- DEGREE OF POLY AND KINETICS CHAIN LENGTH- FACTORS AFFECTING CHAIN POLY INHIBITION AND RETARDATION- VARIOUS POLY KINETICS -IONIC ADDITION CO-ORDINATION POLYMERIZATION.
   (B) CONDENSATION POLYMERIZATION : INTRODUCTION - TYPES OF CONDENSATION POLYMERS-KINETICS OF LINEAR CONDENSATION POLY [illegible] THREE DIMENSIONAL POLYMERS-INORGANICS POLY [illegible]

(C) CO-POLYMERIZATION : INTRODUCTION- CO POLY. COMPOSITION EQUATION- APPLICATION OF CO POLYMERS COMPOSITION EQUATION. BLOCK AND DRAFT COPOLYMERS.

DETERMINATION OF REACTIVITY RATIOS-REACTIVITY RATIOS AND CO-POLY. BEHAVIOR-THE Q-E SCHEME OF ALFREY AND PRICE-CO POLYMER COMPOSITION OF HIGHER CONVERSION-IONIC CO POLY.

6. METHODS OF POLYMERIZATION : BULK - SOLUTION - SUSPENSION - EMULSION - GAS PHASE POLYMERIZATION TECHNIQUES IN DETAIL WITH EXAMPLES - FACTORS AFFECTING THE POLY METHODS WITH RESPECTS TO VARIOUS PARAMETERS.

7. POLYMER DEGRADATION AND STABILIZATION : INTRODUCTION - ABTI-OXIDANTS AND STABILIZERS - THERMALLY STABLE POLYMERS.

TYPES OF DEGRADATION AS THERMAL, MECHANICAL BY ULTRA SONIC WAVES, PHOTODEGRADATION, BY HIGH ENERGY RADIATION, OXIDATIVES AND HYDROLYTIC.

8. POLYMER SOLUTION : THE PROCESS OF POLYMER DISSOLUTION-THERMODYNAMICS OF POLYMER DISSOLUTION - NATURE OF POLYMER MOLECULES IN SOLUTION - SIZE AND SHAPE OF MACRO MOLECULES IN SOLUTION.

9. POLYMER REACTIONS AND POLYMER REACTANTS : INTRODUCTION - HYDROLYSIS - ACIDOLYSIS - AMINOLYSIS - HYDROGENATION - REACTIONS OF VARIOUS SPECIFIC GROUPS.

INTRODUCTION - CYCLIZATION REACTION - HALOGENATION - CROSS LINKING REACTIONS - POLYMER REACTANTS

TEXT BOOKS :

1. ** V.R GOWARIKAR AND N.V. VISWANATHAN, "POLYMER SCIENCE", WILLEY EASTERN LIMITED.
2. ** G.S. MISRA, "INTRODUCTORY POLYMER CHEMISTRY", WILLEY EASTERN LIMITED
3. ** POLYMERS AND RESINS BY GOLDING
4. ** POLYMERS CHEMISTRY BY STEVENS

B.E. III SEM VI(PLASTICS)

P-604 PLASTICS TESTING AND IDENTIFICATION

Teaching Scheme		*Examination Scheme*					
Th.	*Tu pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	4	100	3	50	50	50	225

1. INTRODUCTION : BASIC CONCEPTS OF TESTING-SPECIFIACTIONS AND STANDARDS-PURPOSE OF SPECIFIACTIONS-BASIC SPECIFICATION FORMAT-LONG AND SHORT TERM TESTING OF PLASTICS.
2. MECHANICAL PROPERTIES : INTRODUCTION TO STRESS-STRAIN CURVES-UNDERSTANDING OF TERMS LIKE STRESS,STRAIN,ELONGATION,YIELD POINT, YIELD STRENGTH, PROPORTIONAL LIMIT, TOUGHNESS, MODULUS OF ELASTICITY, SECANT MODULUS, ETC.

*TENSILE TESTS WITHTEST SPECIMEN PREPARATION AND CONDITIONING, APPARATUS, CALCULATIONS OF TENSILE STRENGTH, MODULUS, ELONGATION, FACTORS AFFECTING THE TEST RESULTS.

*FLEXURAL TESTS WITH APPARATUS,SPECIMEN,ETC.

*COMPRESSIVE PROPERTIES - CREEP TESTS LIKE TENSILE AND FLEXURAL CREEP, CREEP CURVES AND THEIR STUDY CALCULATIONS OF MAXIMUM FIBER STRESS - INTERPRETATION AND APPLICATIONS OF CREEP DATA-ISOCHRONOUS STRESS -STRAIN CURVES- STRESS RELAXATION-STRESS-TIME CURVES AND APPLICATION.

*IMPACT TESTS LIKE IZOD AND CHARPY-FACTORS AFFECTING IMPACT STRENGTH-DART IMPACT-TENSILE IMPACT TESTS.

*SHEAR STRENGTH AND ABRASION RESISTANCE TESTS IN DETAIL.

*FATIGUE RESISTANCE TESTS : FLEXURAL FATIGUE, TENSILE FATIGUE, FACTORS AFFECTING TEST RESULTS AND APPLICATIONS.

*HARDNESS TESTS : ROCKWELL HARDNESS, DUROMETER HARDNESS, BARCOL HARDNESS TESTS WITH FACTORS AFFECTING TEST RESULTS AND LIMITATIONS.

3. THERMAL PROPERTIES:INTRODUCTION-TESTS FOR ELEVATED TEMP. PERFORMANCE-SHORT TERM TESTS LIKE HDT,VICAT SOFTENUNG POINT-TORSION PENDULUM TEST-LONG TERM TESTS LIKE HEAT RESISTANCE TEST-UL TEMP. INDEX-CREEP MODULUS/CREEP RUPTURE TESTS-TEST VARIABLES AND LIMITATIONS OF ALL TESTS WITH TEST. PROCEDURE-SPECIMEN PREPARATION, ETC.

THERMAL CONDUCTIVITY AND THERMAL EXPANSION TEST-COEFFICIENT OF LINEAR THERMAL EXPANSION-BRITTLENESS TEMP.,ETC.

4. ELECTRICAL PROPERTIES:INTRODUCTION-TESTS LIKE DIELECTRIC STRENGTH-DIELECTRIC CONSTANT-DISSIPATION FACTOR-SURFACE AND VOLUME RESISTANCE-ARC RESISTANCE-TEST PROCEDURES WITH SPECIMEN PREPARATION IN DETAIL.
5. WEATHERING PROPERTIES : INTRODUCTION-ACCELERATED WEATHERING TESTS LIKE EXPOSURE TO CARBON ARC LAMPS-EXPOSURE TO XENON ARC LAMPS-EXPOSURE TO FLUORESCENT UV LAMPS-OUTDOOR WEATHERING OF PLASTICS.
6. OPTICAL PROPERTIES: INTRODUCTION TO REFRACTIVE INDEX-LIGHT TRANSMITTANCE AND HAZE-PHOTOELASTIC PROPERTIES-COLOUR-GLOSS-TESTS FOR EACH OF THESE.
7. MATERIAL CHARACTERISATION TESTS: MELT INDEX TEST IN DETAIL-CAPILLARY RHEOMETER TEST WITH (1) MELT VISCOSITY V/S SHEAR RATE CURVES (2) SHEAR STRESS V/S SHEAR RATE CURVES-VISCOSITY TESTS IN DETAIL-GPC-THERMAL ANALYSIS TECH.LIKE DSC, TGA, TMA.
8. FLAMMABILITY TESTS : INCANDESCENCE RESISTANCE TEST-IGNITION PROPERTIES-OXYGEN INDEX TEST-SURFACE BURNING CAHARACTERISTICS-SMOKE GENERATION TESTS.
9. CHEMICAL PROPERTIES : IMMERSION-STAIN RESITANCE, SOLVENT STRESS CRACKING RESISTANCE AND ESCR TESTS IN DETAIL.
10. PLASTIC IDENTIFICATION INTRODUCTION, CONCEPT OF IDENTIFICATION, VARIOUS TESTS FOR THERMOPLASTICS AND THERMOSETS-FLAME TESTS-SOLUTION TEST- DENSITY MEASUREMENT-PLASTIC FILM IDENTIFICATION-SELECTION OF PLASTICS-CRITERIA AND APPLICATION, DESIGN CONSIDERATION ETC.

BOOKS FOR REFERENCE :

1. TESTING OF POLYMERS VOL-1,2,3 BY J.V.SCHMITZ AND W.E.BROWN
2. HANDBOOK OF PLASTICS TEST METHODS BY R.P.BROWN
3. THE PROPERTIES AND TESTING OF PLASTIC MATERIALS BY A.E. LEVER AND J. RHYS
4. TESTING OF PLASTICS BY VISHU SHAH

BE IV SEM VII (PLASTICS)

P-605 PLASTIC RECYCLING & WASTE TREATMENT.

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	50	250

1. INTRODUCTION TO PLASTICS.
2. SOURCES OF PLASTIC WASTES.
   - -GENERATION OF INDUSTRIAL PLASTIC WASTES.
   - -PLASTICS IN SOLID WASTES.
   - -FUTURE OF WASTE DISPOSAL.

3. SEPERATION OF COMPONENT OF MUNICIPAL REFUSE
   -SEPERATION PROCESSES.

4. PRIMARY RECYLING.
   -DEGRADATION OF THERMOPLASTICS.
   -INDUSTRIAL PRACTICES.

5. SECONDARY RECYCLING.
   -APPORCHES TO SECONDARY RECYLING.
   -CHEMICAL MODIFICATION OF MIXED PLASTIC WASTE-SECONDARY RECYCLING BY CO EXTRUSION & INJECTION MOLDING.

6. USE OF WASTE PLASTIC AS FILLER.

7. TERTIARY RECYLLING.
   -CHEMICALS FROM WASTE 1.PYROLYSIS 2.CHEMICAL DECOMPOSITION.

8. QUARTERNARY RECYLING. ENERGY FROM PLASTIC WASTE :
   1. INTRODUCION 2. INCINERATOR 3. ENERGY RECOVERY FROM MUNICIPAL REFUSE. 4. ITS EFFECT ON REFUSE. 5. TREATMENT OF PREDOMINANTLY PLASTICS WASTE.

9. DISPOSAL OF WASTE PLASTICS WITHOT RECOVERY OF VALUE.
   1. INCINARATION WITHOUT RECOVERY OF ENERGY. 2. PLASTIC IN LAND FILLED.

10. RECYLING OF VARIOUS PLASTICS.-1. HDPE, 2. ACRYLICS, 3.PET, 4. PVC, 5. ENGG. PLASTICS, 6. MEDICAL PLASTICS.

11. EMERGING TRENDS IN RECYLING.

12. INSTRUMANTATIONS AND CONTROL USED FOR RECYLED PRODUCTS.

13. BIODEGRADATION OF PLASTICS.
    1 APPLICTION OF BIODEGRADED PLASTICS. 2. CLASSIFICATION, PREPARATION AND UTILITIES OF DEGRADABLE PLASTICS. 3. STUDIES IN STARCH FILLED PLASTICS, 4. STUDIES IN JUTE & OTHER NATURAL FIBER FILLED PLASTICS 5. COLLECTION AND SEGGRIGATION OF BIODEGRADABLE PLASTICS.

14. PLASTICS AND ENVIORNMENT.
    1. ENVIORNMENT COUNCIOUSNESS. 2. ENVIORNMENT EDUCTATION & AWERNESS PROGRAMMES. 3. ENVIORNMENTAL POLICIES., LEGESTATION & CODE OF PROTECTION.

BOOKS AND REFERENCES :

1. PLASTIC WASTE,RECOVERY OF ECONOMIC VALUE BY JACOB LEIDNER.
2. PLASTICS WASTE AS POTENTIAL SOURCE OF ENERGY BY O.P.RATRA.
3. RECYLING OF PVC & PVC RICH FRACTIONS FROM MIX PLASTICS.BY M SENDER, INSTITUTE OF MATERIALS PUBLICATION.
4. HYDRAULYSIS OF PLASTICS WASTE BY E.G.LEVER,KUNSTUFE PUB,
5. POLYMER DEGRADATION BY LYNN J. TAYLOR, COMTECH PUB,

BE IV SEM VII (PLASTICS)

P-701 POLYMER REACTION ENGINEERING

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	2	100	3	50	25	25	200

1. INTRODUCTION : KINETIC OF CHEMICAL PROCESS-CLASSIFICATION OF REACTION-DEFINITION OF REACTION RATE-VARIABLES AFFECTING REACTION RATE.

2. KINETICS OF HOMOGENEOUS REACTION : SINGLE AND MULTIPLE REACTION-ELEMENTARY AND NON-ELEMENTARY REACTION-MOLECULARITY AND ORDER OF REACTION-RATE CONSTANT-REPRESENTATION OF REACTION-TEMPERATURE DEPENDENCY OF A RATE EQUATION-ARRHENIUS LAW.

3. INTERPRETATION OF BATCH REACTOR DATA : INTEGRAL AND DIFFERENTIAL ANALYSIS OF DATA FOR CONSTANT VOLUME-FIRST,SECOND ORDER

4. SINGLE IDEAL REACTOR : IDEAL BATCH REACTOR-SPACE TIME AND SPACE VELOCITY-STEADY STATE MIXED FLOW REACTOR-STEADY STATE PLUG FLOW REACTOR-HOLDING TIME AND SPACE TIME FOR FLOW SYSTEM-NON-IDEAL REACTORS.

5. MECHANISM AND KINETICS OF POLYMERIZATION : INTRODUCTION-MECHANISM AND KINETICS OF CONDENSATION, ADDITION.
   RADICAL, IONIC, ANIONIC POLYMERIZATION-CHOICE OF INITIATORS FOR ADDITION POLYMERIZATION-STEREOREGULAR CO-ORDINATION POLYMERIZATION-COPOLYMERIZATION.

6. POLYMERIZATION REACTION ENGINEERING : INTRODUCTION-EMULSION, DISPERSION, PEARL AND BEAD, SOLUTION POLYMERIZATION-SPECIFIC TECHNOLOGY OF POLYMERIZATION OF STYRENE, HDPE, NYLON 6, BUTYL RUBBER-REACTION FOR POLYMERIZATION-CONTROL OF MOLECULAR AND MOLECULAR WEIGHT DISTRIBUTION.

BOOKS FOR REFERENCE

1. OCTAVE LEVELSPIEL-CHEMICAL REACTION ENGINEERING 2ND ED.
2. ANIL KUMAR AND SANTOSH GUPTA-FUNDAMENTALS OF POLYMER SCIENCE ENGINEERING, TATA MCGRAW HILL PUBLISHING COMPANY.
3. POLYMER REACTION ENGINEERING BY K.H.REICHERT

B.E. IV SEM VII (PLASTICS)

P-702 ADVANCE PLASTIC PROCESSING

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	25	25	200

1. FOAM PROCESS : INTRODUCTION TO FOAM PROCESS, GENERAL PRODUCTION METHOD, VARIOUS DEFINITION (TERMINOLOGY), FOAM CLASSIFICATION, RIGID FLEXIBLE, STRUCTURAL.
   A. RIGID : MANUFACTURING FOAM AS PU, POLYESTER CELLULAR, CA, THERMOSETTING FOAM, EPOXY RESIN , PHENOLICS, UF.
   B. FLEXIBLE : FOAMED VINYL, OPEN\CLOSED CELL VINYL FOAM CELLULAR POLY ETHYLENE, XLPE ,ETHYLENE COPOLYMER IONOMER, SILICONE FOAM.

2. REINFORCED PLASTIC MOLDING (MOLDING PROCESS) : HAND LAY-UP TECHNIQUES WITH ITS TYPES, SPRAYUP TECHNIQUES, MATCHED DIE, CONTINUOUS LAMINATION, RESIN TRANSFER MOLDING, FRM, PULTRUSION FILAMENT WINDING.

3. MISCELLANEOUS PROCESS CASTING, ENCAPSULATION, COLORING, COATING, DECORATION, FINISHING, MACHINING.

4. REACTION INJECTION MOLDING
   (A) INTODUCTION : DEFINITION, VARIOUS TERMS IN RIM, REQUIREMENTS, RAW MATERIAL AS MONOMERS LIKE POLYOLS, POLYESTER, ISOCYNATES, CHEMISTRY OF MONOMERS, CHEMICAL SYSTEM, CONCEPT OF EQUIVALENT WT. PRE POLYMERS HDROXYL ANALYSIS, INDEX, ADDITIVES AND AUXILIARY MATERIALS LIKE SURFACTANTS , CATALYST,ADDITIVES, EXPANDING AGENTS, WATER,HARDER, CROSSLINKERS, STORAGE AND HANDLING OF POLYOLS AND ISOCYNATES.
   ADVANTAGES AND LIMITATIONS AS COMPARED TO CAST URETHANE TECHNOLOGY, COMPARISON WITH INJECTION MOLDING, APPLICATIONS
   (B) PROCESS : FORMULATIONS, SELECTION OF PROCESS, PROCESS STEPS IN DETAIL FROM STORAGE TO SHIPMENT, PROCESS VARIABLES AS MAT PROCESS, POLYMER PROPERTY, INDEX, DENSITY, POST CURING, ADVANTAGES & DISADVANTAGES. INSTRUMENTATION & CONTROL GAS LOADING MEASURING THE GAS LOADING & FILLERS, PROCESS C[illegible]

OF MICRO CELLULAR PARTS, PROCESS ADV. & DISADV., DIMENSIONAL CHARACTERISTICS OF RIM PARTS, REINFORCED RIM ELASTOMERS, OTHER RIM PROCESSES LIKE NYRIM ETC., SUMMARY OF FIATURE OF RIM PROCESS, APPLICATIONS IN VARIOUS FIELDS, PU LIKE RIGID & SOFT FOAMS.

(C) MACHINE : BASIC MACHINE TYPES, CHARACTERISTICS OF IDEAL MACHINE, BASIC COMPONENTS OF RIM MACHINE WITH AUXILIARY EQUIPMENTS, DESCRIPTION & FUNCTION OF INDIVIDUAL COMPONENTS OF RIM MACHINE LIKE METERING UNITS WITH DIFFERENT TYPES OF PUMPS.

MIXING UNIT AS SCREW MIX HEAD & INJECTION MIX HEAD & COMPOUNDS AS MONOMER TANKS, LIQUID LEVEL CONTROLLERS, AERATION. BACKUP PUMPS, FILLERS, DRIVE MOTORS,SHUT OFF CONTROLLERS, PRESSURE GAUGES, HOSES,AUTOMATIC CALIBRATION & CLAMPING UNIT WITH CLASSIFICATION AS UNIVERSAL CLAMP DESIGN.INTRODUCTION OF COLOR ADDITIVES IN RIM MACHINE & HEAD/LAY.

5. CALENDERING : PROCESS IN DETAIL, TYPES OF CALENDERS WITH ADV., APPLICATION & LIMITATIONS, DRIVE SYSTEMS, HEATING & COOLING ARRANGEMENTS, MATERIAL SELECTION CRITERIA, TROUBLE SHOOTING.

6. MIXING & COMPOUNDING : BASIC PRINCIPLES, VARIOUS TYPES OF MIXERS & BLENDERS IN DETAIL, PVC COMPOUNDING, MASTERBATCHES ETC.

REFERENCE BOOKS :

1. FRP TECHNOLOGY : R.G. WEATHERHEAD
2. INTRODUCTION TO RIM : SWANEOY P.
3. REACTION INJECTION MOLDING : WALTER BACKER
4. FUNDAMENTALS OF RIM : CRISTOPHER W. M., HANSER PUBLICATIONS
5. POLYURATHANE HANDWORRK : GUNTHER OERTEL, HANSER PUBLICATION
6. PLASTIC MATERILS & PROCESS : SCHWARTZ & GOODMANN
7. PLASTIC ENGG. HANDBOOK : JOEL FRADOS
8. CALENDERING OF PLASTICS : ELDEN * SWAN, ILIFFE

B.E. IV SEM VII (PLASTICS)

P-703 ADVANCE PLASTIC TECHNOLOGY

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	50	250

1. REINFORCED PLASTICS :

A. GENERAL INTRODUCTION : INTRODUCTION USE OFF RP, RESIN, REINFORCEMENT, PROCESS DEV.

B. RESINS : ROLE, TYPES, PROPERTIES, APPLICATION, PROCESSING CHARACTERISTICS GEL COATS ETC.

C. REINFORCEMENTS : ROLE IN FRP, TYPES, APPLICATION, PROPERTIES.

D. ADDITIVES : CATALYSTS, ACCELERATORS, RELEASE AGENTS ETC.

E. MATERIAL PREPARATION TECHNIQUES : RAW STOCK, FINISHED PRODUCTS.

2. ENGINEERING PLASTICS :

A. POLYAMIDES : MANUFACTURING PROCESS, PROPERTIES AND APPLICATION, PROCESSING CHARACTERISTICS OF NYLON{6:66:11:12}

B. ACRYLIC POLYMERS : MANUFACTURING PROCESS {BULK, SUSPENSION, EMULSION, SOLUTION AND GRANULATION POLYMERIZATION}, PROPERTY APPLICATION AND PROCESSING CHARACTERISTICS OF PMMA AND PMA.

C. FLOROCARBON POLYMER : MANUFACTURING PROCESS, PROPERTIES AND APPLICATION OF PTFE, PCTFE, PVF, PVDF, PROCESSING CHARACTERISTICS.

D. HIGH PERFORMANCE THERMOPLASTICS : MANUFACTURING PROCESS, PROPERTIES, APPLICATION AND PROCESSING CHARACTERISTICS OF CHLORINATED POLY ETHER, POLY ACETAL POLY CARBONATE, POLY SULPHONE, PPO.

E. HEAT RESISTANCE THERMOPLASTICS : MANUFACTURING PROCESS, APPLICATION, PROPERTIES AND PROCESSING CHARACTERISTICS OF POLY AMIDE, POLY IMIDES, POLY ETHER SULFONE, PPS-POLY AMIDE-IMIDE,PEEK.

3. FILLER,REINFORCEMENT AND ADDITIVES FOR PLASTICS : PLASTICIZER, STABILIZER, CHEALATINGAGENTS, FILLERS CLASSIFICATION COLORANTS, ANTIOXIDANTS, SPECIAL ADDITIVES AS FLAME RETARDENTS, BLOWING AGENTS, UV ABSORBER, METAL DEACTIVATORS.

(A) PLASTICIZER : HISTORICAL SURVEY, DEFINITION OF TERMS, THEORIES OF PLASTICIZING AND ITS EFFECTS, METHOD OF INCORPORATION, CHOICE OF PLASTICIZER, FIELD OF APPLICATIONS, BEHAVIOR OF PLASTICIZER WITH RESPECTTOENVIRONMENT, CLASSIFICATION, MANUFACTURING PROCESS, EXTENDERS, REQUIREMENTS OF IDEAL PLASTICIZERS.

(B) BLOWING AGENTS : INTRODUCTION, DEFINITION, TYPES, REQUIREMENTS OF AN IDEAL BLOWING AGENT, TESTING OF B. A. , INCORPORATION INTO THE COMPOUNDS, PROCESSING AND APPLICATION, PROPERTIES OF FOAMS, ECONOMIC IMPORTANCE, CLASSIFICATION.

(C) ANTIOXIDANTS : INTRODUCTION, DEFINITION, METHODS OF STABILIZATION, AUTO OXIDATION OF SYNTHETIC POLYMERS IN DETAIL, MECHANISM OF ANTIOXIDANTS WITH ITS TYPES, CHEMICAL, PHYSICAL, AND TOXICOLOGICAL REQUIREMENTS OF ANTIOXIDANTS, CLASSIFICATIONS, IDEAL REQUIREMENT OF ANTIOXIDANT.

(D) FILLERS : INTRODUCTION, DEFINITION, CLASSIFICATION OF ORGANIC AND INORGANIC IN DETAIL WITH MANUFACTURING, IDEAL REQUIREMENTS OF FILLERS, ADVANTAGES AND DISADVANTAGES OF FILLERS.

(E) COLOURANTS : INTRODUCTION, SELECTION CRITERIA, DISPERSION OF COLORS , FORMS OF SUPPLY, COLORATION TECHNIQUES, COLORING OF POLYMERS, TYPE OF COLORANTS.

(F) METAL DEACTIVATORS : INTRODUCTION, FACTORS RESPONSIBLE FOR THE INTERACTIONS BETWEEN METAL/METALLIC COMPOUNDS AND POLYMERS, REQUIREMENTS OF AN IDEAL METAL DEACTIVATORS, STRUCTURAL CLASSES, TESTING.

(G) FLOUROSCENT WHITENING AGENTS : INTRODUCTION, DEFINITION, REQUIREMENTS, TYPES OF F.W., INCORPORATION INTO POLYMERS, PRODUCT FOAMS AND APPLICATION, SELECTION, PHYSICAL PROCESS, TESTING OF F.W. AGENTS.

(H) ANTISTATIC AGENTS : PROBLEM OF CHARGE , SOURCE OF CHARGE, MODE OF ACTION, CLASSES OF COMPOUNDS, FORMATION OF ANTISTATIC EFFECTS, INCORPORATION INTO THE POLYMER.

BRIEF STUDY OF CHEALATING AGENTS, LUBRICATION AND THEIR ADDITIVES, FLAME RETARDENTS, U V STABILIZERS,ETC.

4. FUNCTIONAL POLYMERS :

(A) PHOTO CONDUCTIVE POLYMERS : DEFINITION, PROPERTIES OF IDEALPHOTO CONDUCTIVE POLYMERS, POWER OF PHOTO CONDUCTIVE POLYMERS ,MAT. PREPARATION, APPLICATION.

(B) ION EXCHANGE POLYMERS : CLASSIFICATION ,SYNTHESIS, PROPERTIES, APPLICATION.

(C) BIO POLYMERS : INTRODUCTION, PROTEINS, NUCLEIC ACIDS, POLYSACCHARIDES.

(D) SPIRO & LADDER POLYMERS : PURPOSE, STRUCTURE ,MECHANISM & PROPERTIES.

(E) ELECTRO CONDUCTIVE POLYMERS . INTRODUCTION, COMPARISON WITH METALS, DEF, METHODS OF SYNTHESIS, ADVANTAGES OF USE OF POLYMERS, APPLICATION.

(F) PIEZO ELECTRIC POLYMERS : INTRODUCTION, PIEZO ELECTRIC EFFECT, APPLICATION.

(G) BRIEF STUDY OF INORGANIC POLYMERS & PLASMA POLYMERIZATION

REFERENCES BOOKS :

1 FRP TECHNOLOGY : R.G.WEATHERHEAD.
2. ENGG. THERMOPLASTICS : MARGOLIS J.M.
3 INTRODUCTION TO INDUSTRIAL POLYMERS : HENRI ULRICH.
4. POLYMER TECHNOLOGY : D.C. MILES & J.H. BRYDSON.
5 TEXTBOOK OF POLYMER SCIENCE : FRED W. BILLMEYER JR.
6 PLASTIC MATERIAL : J.A.BRYDSON
7 POLYMER CHEMISTRY : STEVENS.
8 PVC TECHNOLOGY : TITOW.

B.E.IV SEM. VII (PLASTICS)

P-704 PLASTIC EQUIPMENT & PRODUCT DESIGN

Teaching Scheme		*Examination Scheme*					
Th.	*Tu pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	50	250

1. INTRODUCTION : BASICS PRINCIPLES OF PROCESSING MATERIAL DESIGN, SELECTION OF MACHINE. METHOD OF FABRICATION, ECONOMICAL CONSIDERATION

2 MATERIAL OF MOLDS & DIES : STEELS, VARIOUS TYPES , SELECTION CRITERIA, FERROUS & NON FERROUS MATERIAL, ALLOYS. HEAT TREATMENT PROCESSES.

3 FABRICATION TECHNIQUE : LATHE, MILLING, GRINDING, DRILLING, SPARK EROSION, HOBING, ELECTROFORMING, EDM, CNC, ELECTROCHEMICAL MACHINE.

4 INJECTION MOLD DESIGN

•INTRODUCTION : TWO PLATES, THREE PLATE, RUNNERLESS MOLDS, PARTING LINES, SPLIT MOLDS, MOLDS FOR THREADED COMPONENTS.

•FEED SYSTEM : DESIGNS OF VARIOUS TYPES OF RUNNERS, GATES. BALANCING OF RUNNERS. POSITIONING OF GATES, MOLD FILLING PATTERNS, ETC.

• EJECTION SYSTEM : PIN EJECTION, STRIPPER PLATES,VALVE EJECTION. BLADE EJECTION, AIR EJECTION, ETC.

•COOLING & HEATING ARRANGEMENTS : DESIGN OF COOLING CHANNELS, LAYOUTS, ETC.

5 PRODUCT DESIGN :

A. INTRODUCTION : PRELIMINARY DESIGN CONSIDERATION, ECONOMIC FACTORS. AESTHETICS, PERFORMANCE REQUIREMENTS & BENEFITS. MAT SELECTION (SHORT TERM & LONG TERM PROPERTIES).

B PRODUCTION DESIGN FEATURES : TEXURING, SHAPE, SURFACE FINISH. POSITIONING OF HOLES, RIBS, BOSSES ,RADII, UNDERCUTS, DRAFT ANGLE, TOLERANCE, WALL THICKNESS. THREADS, SHRINKAGE CONSIDERATION. COST ECONOMICS.

C SAMPLE PRODUCT DESIGN : FOR VARIOUS APPLICATION LIKE STRUCTURAL MEMBERS, GEARS,BEARING ETC

REFERENCE BOOKS :

1. INJECTION MOLDING MACHINES -WHEELEN
2 PLASTIC PRODUCT DESIGN -BECK
3. PRODUCT DESIGN WITH PLASTICS -DYM
4 INJ. MOLD DESIGN FUNDAMENTALS :DENTON &GLANVILL
5. INJ MOLD DESIGN PYE
6 EXTRUSION DIES :WALTER MECHEALI
7 DIES FOR PLASTIC EXTRUSION:M. V. JOSHI.

B.E. IV SEM. VIII (PLASTICS)

P-705 PLASTICS ENGG. SAFETY & QUALITY MANAGEMENT

Teaching Scheme		*Examination Scheme*					
Th.	*Tu pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	-	100	3	50	-	-	150

A. SAFETY MANAGEMENT

1. INTRODUCTION : WHY AN ACCIDENT, PREVENTION PROGRAMME. HIDDEN COST OF ACCIDENTS, SAFETY AND PRODUCTION, MANAGEMENTS RESPONSIBILITY, STATISTICS FOR PLASTICS INDUSTRIES.
2. PLANNING FOR SAFETY : BASIC ELEMENTS, MANAGEMENT'S ROLE, SAFETY COMMITTES, DUTIES OF SECTIONAL HEADS, SAFETY ON JOB. JOB SAFETY ANALYSIS, SAFETY AWARENESS.
3. ACCIDENTS RECORDS AND MEASUREMENTS : ACCIDENTS REPORTS, INJURY RECORDS, ACCIDENT ANALYSIS, RATES, INVESTIGATIONS.
4 OCCUPATIONAL SEFETY AND HEALTH ACT REQUIREMENTS : ACT REQUIREMENTS. ITS COVERAGE, INSTITUTES, ENFORCEMENTS
5. MAINTING INTEREST IN SAFETY : PROGRAMME OBJECTIVES, AWARDS, BULLETINS, OTHER APPROACHES.
6. FIRE PROTECTION : PLANT LAY OUT, DESIGN OF EQUIPMENTS, STORAGE AND HANDLING, WASTE DISPOSAL, TRAINING, FIRE INSURANCE
7. HEALTH-HYGINE.
8 INSPECTION AND HOUSE KEEPING
9 MACHINERY AND ITS PROTECTION.
10 USE OF COMPUTERS IN MAINTENANCE AND SAFETY

B. QUALITY MANAGEMENT

1. WORLD WISE QUALITY MANAGEMENT PRACTICE
2 QUALITY COUSTOMERS, AND ISO 9000
3 ISO 9000-A MANAGEMENT OVERVIEW
4 DETAILS OF COMPANYS QUALITY POLICY
5 ISO 9000 STANDARDS AND PRODUCTION
6 PROCESS CONTROLS BY CONTROL CHARTS
7 PROBLEM SOLVING BY SEVEN TOOLS
8. DATA, RECORDS AND TREACIBILITY
9 INSPECTION TEST, STANDARDS AND CALIBRATION
10 DOCUMENTING THE QUALITY SYSTEM
11 QUALITY AUDIT
12. TAGUCHI METHOD
13 IMPLEMENTING ISO 9000
14 ISO 9000 REGISTRATION
15 TQM-CONCEPTS AND ACCESSORIES
16 INTRODUCTION TO ISO 14000

BOOKS AND REFERENCES

1 PLASTIC INDUSTRY SAFETY HAND BOOK BY DOMINICK V. ROSATO & JOHN R. LAWRENCE PUB BY CAHNERS PRACTICAL PLASTIC SERIES MASSACHUSETTS
2 ISO 9000, CONCEPTS. METHODS, & IMPLEMENTATION BY TAPAN BAGCHI PUB BY WHELLER PUBLISHING NEW DELHI

B.E. IV SEM. VII (PLASTICS)

P-706 SEMINAR

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr.*	*Theo marks*	*hr*	*Sess mark*	*Pr./Oral mark*	*Term work*	*Total marks*
-	4	-	-	-	25	25	[illegible]

UNDER GIVEN SUBJECTS STUDENT WILL MAKE AS UP TO DATE LITERATURE SURVEY WITH REFERENCE TO TOPICS ASSIGNED UNDER THE SUPERVISION OF STAFF MEMBERS AND WILL SUBMIT TWO COPIES OF SUCH PAPERS. HE/SHE WILL PRESENT IN THE FORM OF PAPER BY A GIVING A TALK DURING THE REGULAR SEMINAR PERIODS WICH WILL COVER FOLLOWING POINTS.

1 INTRODUCTION
2 DEFINITIONS
3 RAW MATERIALS/SELECTION CRITERIA OF PROCESS
4. PROCESS IN DETAILS
5 VARIOUS PROCESS PARAMETER
6. PROPERTIES
7 APPLICATION
8. TEST
9. RECENT DEVELOPMENT IN TOPIC
10 CONCLUSION
11. APPENDIX
   1 DEMAND/SUPPLY GAPE
   2. NAME OF THE MANUFACTURER
      A. RAW MATERIAL
      B. MACHINE
      C MOLD/DIE
      D. AUXILARY EQUIPMENT
   3. SAFETY AND HAZARDS OF THE PRODUCT
   4 PROCESS CONTROL AND INSTRUMENTATION
12 REFERENCES

B.E. IV SEM. VIII (PLASTIC TECHNOLOGY)

P-801 PLASTIC ALLOYS AND BLENDS

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr*	*Theo marks*	*hr*	*Sess. marks*	*Pr/Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	25	225

I INTRODUCTION : ALLOYING & BLENDING -DEFINATION-NEED TO ALLOY & BLEND POLYMERS-POLYMER THAT CAN BE BLENDED-INTRODUCTION TO COMPOSITES-RAW MATERIAL SELECTION CRITERIA.

II ALLOYS & BLENDS

A INTRODUCTION : HISTORICAL OUTLINE OF INDUSTRIAL DEVELOPMENT OF POLYMER ALLOYS AND BLENDS-DEFINITIONS-THE REASONS FOR AND METHODS OF BLENDING-HOW TO SELECT BLEND COMPONENTS-FUNDAMENTAL PRINCIPLES FOR DEVELOPMENT OF POLYMER ALLOYS AND BLENDS.

B POLYMER-POLYMER MISCIBILITY : GENERAL PRINCIPLES OF PHASE EQUILIBRIA CALCULATION-THEORIES OF LIQUID MIXTURES CONTAINING POLYMER . HUGGINS-FLORY THEORY, EQT. OF STSTE THEORIES. GAS-LATTICE MODEL, SIMHA'S CELL-HOLE THEORY, ETC.

MECHANISMS OF PHASE SEPARATION-GENERAL TYPES OF POLYMER BLENDS-POLYMER CRYSTALIZATION-MORPHOLOGY OF BLENDS-MEASUREMENT OF POLYMER/POLYMER INTERACTION.

C. BLEND PREPARATION EQUIPMENTS : MIXERS' AND THEIR VARIOUS TYPES LIKE BANBURY, HOT AND COLD MIXERS, TWIN SCREW COMPOUNDERS, TWO ROLL MILLS, ETC.

DESIGN FEATURES OF THESE EQUIPMENTS LIKE ROTOR TYPES, SCREWS AND THEIR VARIOUS TYPES; FLOW BEHAVIOUR OF THE PLASTIC MATERIAL IN THE MIXING EQUIPMENTS, THEORY OF MIXING ETC.

D. CHARACTERISATION OF BLENDS : CHARACTERISATION TECHNIQUES LIKE DIFFERENTIAL SCANNING CALORIMETRY, UVIR, FTIR, SCANNING ELECTRON MICROGRAPHS ETC.

E. COMMERCIAL POLYMER ALLOYS AND BLENDS : BLENDS OF ENGINEERING AND COMMODITY PLASTICS LIKE PVC/ABS, PVC/SAN, PVC/NBR; PC/PET. PC/PBT, PC/ABS; PPO/HIPS; ETC STUDY IN DETAIL ALONG WITH PROPERTIES AND APPLICATIONS.

BOOKS :

-POLYMER ALLOYS AND BLENDS BY L. A.UTRACKI
-POLYMER ENGINEERING AND SCIENCE ENCYCLOPEDIA

B.E. IV SEM. VIII (PLASTICS)

P-802 PLASTIC PROCESS INSTRUMENTATION & CONTROL

Teaching Scheme		*Examination Scheme*					
Th.	*Tu pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr•Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	25	225

1. INSTRUMENTATION & PROCESS CONTROL IN PLASTIC INDUSTRY PLASTIC PROCESS INSTRUMENTATION & CONTROL

1. INSTRUMENTATION REQUIREMENTS : MEASUREMENTS, ROLE OF INSTRUMENTS, RANGE, ERROR, ACCURACY, PRECISION, SENSITIVITY, RESOLUTION, BLOCK DIG. OF INSTRUMENTATION SYSTEM

2. PRESSRURE MEASUREMENT.
   A. PNEUMATIC PRESSURE TRANSDUCERS
   B. MECHANICAL CONSIDERATION.
   C SPECIFICATIONS.
   D. COMPARISON OF DIFFERENT TRANSDUCERS
3 TEMPERATURE MEASUREMENTS
   A. METHODS OF TEMP. MEASUREMENT
   B BARREL TEMP. MEASUREMENT
   C STOCK TEMP. MEASUREMENT.
   D. ULTRA SOUND TRANSMISSION LINE
4. OTHER MEASUREMENTS.
   A POWER MEASUREMENT
   B RATATIONAL SPEED MEASUREMENT
   C EXTRUDATE THICKNESS
   D. EXTRUDATE SURFACE CONDITION
5 TEMPERATURE CONTROL
   A. ON-OFF CONTROL
   B PROPOTIONAL CONTROL
   C. PROPOTIONAL INTEGRAL CONTROL
   D PRO. INTEG. DERIVATIVE CONTROL
   E DUAL SENSOR TEMP. CONTROL
6. CONTROLLERS
   A TEMP. CONTROLERS-ANALOG & DIGITAL
   B POWER CONTROLERS
   C DUAL OUT PUT CONTROLERS
7 TEMP. CHARACTERISTICS
   A. THERMAL INERTIA OF SYSTEMS
   B MEASURING OF RESPONSE
   C TEMP. CHARACTERISTICS
8 TUNING OF THE CONTROLER PARAMETERS
   A PERFORMANCE CRITERIA
   B EFFECT OF THE PARAMETERS
      ON TUNED TEMP. CONTROLERS
   C SELF TUNING TEMP. CONTROLERS
9. TOTAL PROCESS CONTROL
   A TOTAL EXTRUSION PROCESS CONTROL
   B TOTAL INJ. MOLDING PROCESS CONTROL

BOOKS

1. J D LENK, HAND BOOK OF CONTROLS & INSTRUMENTATION; PRENTICE HALL CORP
2. J A MILLER, CONTROL ENGG.
3. P D ROBERTS, MEASUREMENT & CONTROL
4. C L SMITH, INSTRUMENTS & CONTROL SYSTEMS.
5. INDUSTRIAL INSTRUMENTATION & CONTROL -S.P.SIGN
6. PLASTIC INDUSTRY SAFETY HAND BOOK-S.P.E

B.E. IV SEM. VIII (PLASTICS)

P-803 COMPUTER PROGRAMMING & AUTO CAD IN PLASTICS ENGG.

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr*	*Theo marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	25	225

A. COMPUTER PROGRAMMS FOR PLASTICS ENGINEERS

1. PROBLEMS IN ISOTHERMAL VISCOMETRY.
2. PROBLEM INVOLVING VISCOELASTIC PARAMETERS.
3. PROBLEMS IN PROCESSING OF PLASTICS.
   - I MELTING IN PLASTICS EXTRUSION
   - II OPERATIONAL CHARACTERISTICS OF PLASTICS EXRTRUDERS.
   - III BUILDING A PLASTICS PROCESS MODEL.
   - IV AUTOMIZE DATA COLLECTION IN PLASTICS PROCESSING
   - V SHEAR RATES AND FLOW VELOCITIES IN WIRE COVERING DIES.
   - VI DESIGN OF COOLING CYCLES FOR MOLDING FOR MOLDING CRYSTALLINE POLYMERS
4. PROCESSING OF PHYSICAL MEASUREMENT.
   1. PROGRAMMING FOR MOLECULAR WEIGHT MEASURMENT
   2. DIELECTRIC CONSTANT AND LOSS FACTOR CALCULATION.
   3. COMPUTATION FOR SOLUTION VISCOMETRY.
   4. PROGRAMMES FOR PARTICLE SIZE DISTRIBUTION.
5. PRODUCT PERFORMANCE TEST
   1. ESTIMATION OF HYDRO STATIC STRENGTH OF THERMOPLASTICS PIPES

B. AUTO CAD

1. INTRODUCTION
2. BASICS-ACCURACY, INTELLEGENCE, IMPLEMENTATION, SOFTWARE CUSTOMIZATION, THE PACKAGE, THE MANUAL, THE DRAWING EDITOR.
3. CREATION OF DRAWING
4. LEARNING THE TOOLS FOR THE TRADE
5. ORGANIZING THE TOOLS FOR THE TRADE.
6. EDITING FOR PRODUCTIVITY
7. MANAGING A LARGE DRAWING
8. PRINTING AND PLOTTING
9. ADDING TEXT TO DRAWLING.
10. USING DIMENSIONS
11. STORING DATA WITH GRAPHICS.
12. POWER EDITING.
13. CURVES AND SOLID FILES.
14. MODELLING IMAGING IN 3D
15. USING ADVANCE 3D FEATURES.
16. 3D DRAWING WITH AUTO SHADE.
17. MASTERING 3D SOLID.
18. INTEGRATING AUTO CAD IN THE PROJECT & ORGANISATION.

BOOKS & REFERENCES :

1. MASTERING AUTO CAD RELEASE 11, 4TH EDITION BY GEORGE OMURA-SYBEX/TECH ASIAN EDITION.
2. COMPUTER PROGRAMMS FOR PLASTICS ENGINEERS BY KLEIN AND MARSHALL, POLYMER SCIENCE AND ENGG. SERIES, REENHOLD BOOK CORPORATION, LONDON.

B.E. IV SEM. VIII (PLASTICS)

P-804 FRP TECHNOLOGY

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo marks*	*hr*	*Sess marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	25	225

1. GENERAL INTRODUCTION
   1. INTRODUCTION
   2. NEED OF FRP
   3. NEED OF RESIN
   4. REINFORCEMENTS
   5. PROCESS DEVELOPMENTS.
2. DESIGNING IN FRP
   1. INTRODUCTION
   2. DESIGN-MATERIAL SELECTION-PROCESS SELECTION-SECTION THICKNESS-FLANGES AND CORNERS-INSERTS
   3. FLAT SHEETS-BUILDING AND CLADDING PANELS -HOLLOW STRUCTURES
3. MOLDS
   1. INTRODUCTION.
   2. TYPES OF SIMPLE MOLDS
   3. GRP MOLDS-SINGLE ONE PART-SPLIT MOLD AND MATCHING MOLDS
   4. EPOXIDE MOLDS -SINGLE STAGE CASTING-TWO STAGE CASTING
   5. EPOXIDE RESIN MOLDS-SINGLE STAGE CASTING AND TWO STAGE CASTING
   6. STEEL MOLDS -HOT PRESS MOLDING -CENTRIFUGAL MOLDING-TRANSFER AND INJ. MOLDING-PULTRUSION
   7. ALLUMINIUM ALLOY MOLDS
   8. NICKEL SHELL MOLDS-OTHER MOLD
4. POLYESTER RESINS

   INTRODUCTION-POLYESTER RESINS -GLYCOLS-UNSATURATED ACIDS-SATURATED ACIDS MONOMERS-INHIBITORS

   COMMERCIAL RESINS

   -GELCOAT/TOP COAT RESINS

   -GENERAL PURPOSE RESINS

   -CHEMICAL RESISTANT RESINS

   -REDUCED FLAMABILITY RESINS

   -LOW STYRENE EMMISSION RESINS

   -LOW SHRINKAGE /LOW PROFILE RESINS

   -SPECIAL PURPOSE RESIN

   -COATING RESIN

   -FOAMED POLYESTER RESINS

   -COMMERCIALLY AVAILABLE RESINS
5. CATYLYST/ACCELERATORS AND INHIBITORS FOR UNSATURATED POLYESTER RESINS

   -INTRODUCTION

   -CURING REACTIONS

-CATALYST OFR INHIBITATORS-DIACYL PEROXIDES-KETON PEROXIDES. HYDRO PEROXIDES-DIALKYL AND DIARALKYL PEROXIDE -PEROXY ESTERS. PERKETALS.
-ACCELERATORS OR PROMOTORS-METAL COMPOUNDS-TERTIALTY AMINE. ACCELERATORS-MIXED MATEL SALTS-T-AMINE ACCELERATORS
-INHIBITORS
-COMMERCIALLY AVAILABLE MATERIAL

6 REINFORCEMNTS
1. INTRODUCTION
2. SURFACIONG TISSUE
3. GFR
-COUNTINUOUS FILAMENT ROVINGS
-CHOPPED STRANDS
-CHOPPED STRAND MATS
-COUNTINUOUS STRAND MAT
-WOVEN GLASS FEBRICS
4. CARBON FIBER
5. AROMATIC POLYAMIDE(ARAMID) FIBERS
6. OTHER REINFORCING FIBERS
-POLYESTER FIBERS
POLYACRYLONITRILE FIBERS
-NYLON
-PVC AND PVDC
-COTTON
-SISAL
-ASBESTOS
-PAPER
-JUTE
BORON FIBERS
7. COMMERCIALLY AVAILABLE REINFORCEMEMTS

7 FILLERS AND PIGMENTS
INTRODUCTION
1. MINERAL FILLERS-CARBONATES-SILLICA AND SILICATES-ALLUMINIUM SILICATES AND CLAYS
2. GLASS FILLERS
4. METAL OXIDE FILLERS
5. METALLIC POWDER FILLERS
6. OTHER FILLERS
7. THIXOTROPIC ADDITIVES
8. FLAME FRETARDANT FILLERS
9. PIGMENTS AND DYES

8 MISCELLANEOUS MATERIALS
-INTERNAL LUBRICANTS-SKIN FORMERS-LIGHT STABILIZERS
-REALESE AGENTS AND SEALING COMPOUNDS
-WAX RELEASE AGENTS
-POLY VINYL ALCOHOL
-SPRAY RELEASE AGENTS
-SHEET RELEASE AGENTS
-SILICONE RELEASE AGENTS
-CELLULOSE ACETATE
-NITROCELLULOSE

-SHELLAC
-CORE MATERIAL
-BALSA WOOD
-FIRET COREMAT
-INTERCEL
-HONEYCOMBS
COUPLING AGENTS

9. DOUGH AND SHEET MOLDING COMPOUNDS AND PREPREGS
INTRODUCTION
-DOUGH AND BULK MOLDING COMPOUNDS
-SHEET MOULD COMPOUNDS-MANUFACTURE OF SMC
-PREPREGS-MANUFACTURE OF PREPREGS
-COMMERCIAL PRODUCTS

10. MOLDING PROCESSES
INTRODUCTION
-CONTACT MOLDING-WET LAY UP-HAND LAY UP
-SPRAY LAY-UP
-VACUUM BAG MOLDING
-WET LAY-UP
-PREPREG SYSTEMS
-PRESSURE BAG MOLDING
-RESIN TRANSFER OR RESIN INJECTION MOLDING
-PRESSURE INJECTION
-VACUUM IMPREGNATION AND INJECTION
-VACUUM IMPREGNATION
-VACUUM INJECTION MOLDING-HOECHST PROCESSS
-VACUUM INJECTION-BRITISH RAIL PROCESS
-MONOFORMING
-CSI PROCESS
-FOAM RESERVOIF MOLDING
-COLD PRESS MOLDING
-HOT PRESS/MATCHED METAL MOLDING
-LIQUID RESIN /CHOPPED STRAND MAT
-LIQUID RESIN/PREFORM
-SMC AND PREPREGS
-DMC OR BMC
-TRANSFER MOLDING
-INJECTION MOLDING
-FILAMENT WINDING
-WET LAY UP-PREPREGS-OTHER APPLICATIONS
-CENTRIFUGAL MOLDING
-CONTINUOUS SHEET MANUFACTURE
-PULTRUSION
-SANDWICH WITH PREFORMED MATERIALS 1.C-FLEX PLANDING SYSTEM
2 'DURADENSE' BUILDING SYSTEM
-TRIMMIG AND FINISHING

BOOKS AND REFERENCES :

1 FRP TECHNOLOGY BY WEATHERHEAD.

B.E. IV SEM. VIII (PLASTICS)

P-805 PROJECT

Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
-	6	--	--	--	100	50	150

EACH STUDENT IS REQUIRED TO SUBMIT PROJECT REPORT WHICH SHOULD CONSIST OF FOLLOWING CHAPTERS :

1. INTRODUCTION
2. MARKET POTENTIAL
3. PLANT CAPACITY
4. RAW MATERIALS
5. PROPERTIES
6. APPLICATION
7. MANUFACTURING PROCESS
8. SPECIFICATION AND DESIGN
9. PLANT LOCATION AND LAY OUT
10. COST ESTIMATION

CONCLUSION

APPENDIX

1. DEMAND/SUPPLY GAP
2. NAME OF MANUFACTURER
   A. RAW MATERIAL B. MACHINE C. MOLD DIE D. AUXILLARY EQUIPMENT
3. SAFETY AND HAZARDS OF PRODUCT
4. PROCESS CONTROL AND INSTRUMENTATION

REVISED SYLLABUS OF B.E. CHEM. RUBBER PLASTICS TEACHING AND EXAMINATION SCHEME

(In force from sept., 1997)

B.E. II Semester (III & IV) (Chem;Rub;Pl) REVISED

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
301	Inorganic Chemistry	4	4	100	3	50	25	25	200
302	Fluid flow operations	3	4	100	3	50	25	25	200
303	Material Sci. & Tech.	3	1	100	3	50	-	-	150
304	Computer Programming	3	4	100	3	50	25	25	200
305	Maths-III	4	-	100	3	50	-	-	150
		17	13	500	-	250	75	75	900

REVISED

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
401	Physical Chemistry	3	3	100	3	50	25	25	200
402	Organic Chemistry	4	3	100	3	50	25	25	200
403	Chemical Pro. Inds.-I	3	3	100	3	50	25	25	200
404.	Process Calculations	4	1	100	4	50	-	-	150
405.	Proc.Heat Transfer	3	3	100	3	50	25	25	200
		17	13	500	-	250	100	100	950

Note : B.E.II Sem III & Sem IV are common for Chemical, Plastic & Rubber.

TEACHING AND EXAMINATION SCHEME

B.E. III Sem. V (Rubber)

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Theo. marks	hr	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
501.	Principles of Thermodynamics	3	1	100	3	50	-	-	150
502.	Vulacanization	3	2	100	3	50	50	25	225
503.	Rubber Tech. I	3	3	100	3	50	50	25	225
504	Rubber Processing-I	3	4	100	3	50	50	50	250
505.	Rubber Engg.-I	3	4	100	3	50	50	50	250
506.	Industrial Training	-	-	-	-	-	-	-	-
		15	15	500	15	250	250	175	1100

B.E. III Sem. VI (Rubber)

Sub. No	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
601.	Rubber Equi. Design-I	4	4	100	3	50	50	25	225
602	Rubber Inds. Mang. & Eco.	3	-	100	3	50	—	—	150
603	Rubber Tech.-II	3	3	100	3	50	50	25	225
604	Rubber Process.-II	3	4	100	3	50	50	50	250
605	Rubber Engg.-II	3	3	100	3	50	50	50	250
606	Industrial Training	-	-	-	-	-	-	-	-
		16	14	500	15	250	200	150	1100

In-Plant Training of 6 / 8 weeks during vacation of Semester V & VI

TEACHING AND EXAMINATION SCHEME

B.E. IV Sem. VII (Rubber)

Sub. No	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
[illegible]	Polymer Reaction Engineering	3	2	100	3	50	25	25	200
[illegible]	Rubber Processing-III	3	3	100	3	50	25	25	200
[illegible]	Rubber Tech.-III	3	3	100	3	50	50	50	250
[illegible]	Rubber Equi. Design-II	[illegible]	3	100	3	50	50	50	250
[illegible]	[illegible] Plant & Process Engg.	3	-	100	3	50	-	-	150
706	Seminar/Minor Project	-	4	-	-	-	25	25	50
*707	Industrial Training	-	-	-	-	-	25	25	50
		15	15	500	15	250	200	200	1150

* Evalution of training taken during V and VI semester.

B.E. IV Sem. VIII (Rubber)

Sub. No	Name of Subject	Teaching Scheme Th	Tu/pr	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
801	Tyre & Tube Technology	3	3	100	3	50	50	25	225
802	Belts, Hoses, Footwear Tech	3	3	100	3	50	50	25	225
803	Rubber Engg.-III	3	3	100	3	50	50	25	225
804	Rub. Process Computer Aided Design	3	3	100	3	50	50	25	225
805.	Project	-	6	-	-	-	100	50	150
		12	18	400	12	200	300	150	1050

301. Inorganic Chemistry

Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	4	100	3	50	25	25	200

1. Atomic structure : Bohr's theory H atom. Wave mechanics, schrodinger wave equation, Quantum Nos. distribution of electrons.
2. Periodic table : Modern periodic law and long form periodic table, Periodic tends in size, atomic radii, Ionic radii, Electron affinity etc.
3. Nature of Chemical bonding : Ionic, co-valent, co-mote nate bond, and its properties. V.B. and M.O. Theory, Hydridization & resonancer, electron pair repulsion theory. H-bond, vander waal forces.
4. Metallurgical processes and metals : principles involved in concern of ores. extraction, refining and physical-Chemical properties of Iron, Steel. Ti. Al, Cu, Th, Uranium, Ni, Zn. and Ind. application.
5. Chemistry of Non-Transitional elements : H,N, P, S. and its compound.
6. Chemistry of complex salt : Werner's Co-ordination theory, isomerism complex, Chelation stability of complex. Theory of Co-ordinate bond in metal complex.
7. Inorganic reactions : Dissociation, addition, free radicals, substitution, exchange reactions and its mechanisms, oxi-red. reaction. Organometallic compounds and Inorganic polymers.

Practical Term-work :

Volumetric analysis : Preparation of standard solution. Acid-base,oxi-red., Orgentometric, complexo metric titration, Iodometric titration. Determination of Mn. from pyrolusite.

Gravimetric analysis : Determination of Fe, Ni, SO and Cl, analysis of Iron-alloy.

Preparation : (a) Chrome-Alum (b) Potash-Alum (c) Micro-cosmic salt (d) Cuprous chloride etc.

Books :

(1) Advanced Inorganic Chemistry - By Cotton & Wilkinson.
(2) Inorganic Chemistry - By Gilrith.
(3) Inorganic Chemistry - By P.L.Soni.

302. Fluid Flow Operations

Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	4	100	3	50	25	25	200

Nature of fluid: fluid statics, transport properties, boundary layer; drag force; mass velocity; average velocity; potential flow, streamlines etc

Reynold number and its significance, laminar and turbulent flow;

Equation of continuity, Bernoulli's equation, frictional losses in channels, Measurement of flow; Transportation of fluids; pumps, its characteristics and pump design; pipe fittings; fluid moving machinery, flow passed bodies, aerodynamics. Settling of

solids, two phase gas-liquid flow in pipes.

Dimensional Analysis.

Practical and Term-work :

Experiments based on metering devices such as venturimeter, orificemeter, rotameter etc.

Experiments based on Characteristics of pumps, fans, compressors etc.

Experiments based on measurements of pressure drops.

Study experiments on laminar and turbulent flow visualization.

Books :

1. Unit Operations of Chemical Engineering- W.L.Mccabe and J.C. Smith.
2. Chemical Engineering Vol. I- Coulson and Richardson.
3. Fluid Dynamics and Heat Transfer- Knudson and Katz.

303. Material Science and Technology

Teaching Scheme		Examination Scheme					
Th	Tu pr	Theo marks	hr	Sess. marks	Pr. Oral marks	Term work	Total marks
3	1	100	3	50	--	--	150

1. Engg Materials : classification, structure of solids, complex structures-polymorphism, amorphours and partly crystalline structures
2. Phase Transformations & Phase Equilibria : phase transitions-solid solutions and intermetallic compounds, phase rule, cooling curves, phase equilibrium diagrams for solid solutions, phase transformations, phase equilibrium diagrams for alloy systems like steel, Cu-Zn, Cu-Sn, Cu-Ni, Cu-Ag, Cu-Al, Al-Si, Ni-Cr etc., Non-equilibrium cooling, Time-temp transformations and continuous cooling transformations for alloys, heat treatments for alloys.
3. Polymers : Thermosetting and Thermoplastic polymers, structure property relationship in polymers, elastomers, polymer processing and reprocessing.
4. Corrosion : Importance for chemical Engg., classification of different types, basic mechanisms of corrosion, polarisations, factors influencing corrosion-environmental and internal factors, passivity
5. Corrosion control & prevention : Protection by design, inhibitors, corrosion resistance of ferrous, copper, alluminium, nickel, titanium, lead etc. and their alloys in diferent conditions with effect of different alloying elements
   Cathodic protection
   Anodic protection
   Protective materials : corrosion resistant coatings, linings & cladding with types, techniques & applications
6. Engg. Materials For Chemical Process Industries.
   Applications in different conditions for low carbon & low alloys steels, cast iron, stainless steel, [illegible] & alloys, copper & alloys, Al & alloys, Titanium & alloys, lead, glass, [illegible], rubbers & elastomers, carbon & graphite etc
   Selection of materials for chemical industries
   (a) [illegible] requirements (b) Selections of class of materials
   (c) [illegible] analysis & final selection
7. Recent trends in Chemical Engg. materials & composites

Books :

1. Nature and properties of Engineering Materials- D. Zester Zebski
2. Engineering Physical Metallurgy- Yu Lakhtin
3. Elements of material science- Van Wale
4. The Science and Engineering of Materials- Donald R. Askland

304. Computer Programming

Teaching Scheme		Examination Scheme					
Th	Tu pr	Theo marks	hr	Sess marks	Pr. Oral marks	Term work	Total marks
	4	100	3	50	25	25	200

1. Introduction to computers : computer languages like machine language and high level languages, hardware, terms etc
2. Programming with Basic, C or other advanced developed languages with development of flow chart and algorithms
   Problems in process design, mathematical models for simple processes, programs for flowsheet material and energy balances calculations
3. Chemical Engg. application of software etc. The above topics should be discussed with respect to its application for chemical engg and allied industries. Chemical Engg. problems should be discussed

Practical and Term-work :

Experiments based on the above topics for the for preparing algorithms, programmes etc [illegible] problems. Practice [illegible] operation of various ready made software and preparing [illegible] software should be given during the laboratory hours. Experiments on computation and applications should be given based on the above topics

Books :

1. Computer primer- D. Rajaraman and V. Rajaraman
2. Computer Today- D. H. Sanders
3. Computer and common sense- R. Hunt and J. Shelly
4. Programming in ANSI C by E. Balaguruswamy OR Gottfried
6. Programming in Basic by E. Balaguruswamy OR Gottfried

305. Applied Mathematics—III

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs	Sess marks	Pr. Oral marks	Term work	Total marks
4	--	100	3	--	--	--	100

1. **Fourier Series :** Periodic functions, Dirichlet's conditions, Fourier series, Euler's formulae, Fourier expansion of periodic functions with period 2π, Fourier series of even and odd functions, Fourier series of periodic functions with arbitrary periods, Half range Fourier series, Harmonic analysis
2. **Laplace Transforms :** Motivation, Definition, Linearity property, Laplace transforms of elementary functions, Shifting theorem Inverse Laplace transforms, Laplace transforms of derivatives and integrals, Convolution theorem, Application of Laplace transforms in solving ordinary differential equations, Laplace transforms of periodic, Unit step and Impulse functions
3. **Ordinary Differential Equations :** Linear differential equations of higher order with constant coefficients, Method of variation of parameters, Higher order linear differential equations with variables coefficients (Cauchy's and Legendre forms), Simultaneous linear differential equations, Models for the real world problems and their solutions in particular, Modelling of electric circuits, Deflection of beams, Free oscillations, Forced oscillations, Resonance. Solution of Bessel and Legendre equations by series method, Definition and properties of Bessel's functions, Legendre's polynomials and properties, recurrence relations, orthogonality
4. **Partial Differential Equations :** Formation of Partial differential equations, Directly integrable equations, Models of Engineering problems leading to first order partial differential equations, Lagrange's equation, Solutions of special type of first order partial differential equations, Homogeneous linear equations with constant coefficients, Applications of partial differential equations, Boundary value problems and method of separation of variables, Modeling of vibration of a stretched string, one dimensional wave equation
5. **Numerical Methods :** Motivation, Errors, Truncation error, Round off error, Absolute error, Relative error and Percentage error, Solution of algebraic and transcendental equations by Newton-Raphson, Regula [illegible] method, Convergence [illegible]

	[illegible]	
1.	Dr. B. S. Grewal	Higher Engineering Mathematics, Khanna Publishers, New Delhi
2.	Prof. Wartikar & Wartikar	Engineering Mathematics Vol. I, II, Pune Vidyarthi Griha, Pune
3.	Dhawan & [illegible]	Engineering Mathematics, Dhanpat Rai & Sons, New Delhi
4.	S. S. Sastry	Engineering Mathematics Vol. I & II, Prentice Hall of India, New Delhi
5.	P. D. S. Verma	Mathematics for Engineering Students, Kalyani Publishers, Ludhiana & Delhi
6.	N. P. Bali, Ashok Saxena & Iyengar	A Text Book on Engineering Mathematics, Laxmi Publication (P.) Ltd. New Delhi
7.	Kandasamy, Thilagavathi & Gunavathi	Engineering Mathematics Vol. I, II, III, S. Chand & Co. (Pvt.) Ltd. New Delhi
8.	Chandrika Prasad	A First Course in Mathematics for Engineers, [illegible]

(3) Advanced Mathematics for Engineers, Prasad Mudranalaya, 7 Veli Avenue, Allahabad.

9. Kumbhojkar, G. V. : Engineering Mathematics Vol. I, II, III, IV. C. Jamnadas & Co. Bombay.

10. Majumdar, T : Engineering Mathematics Vol. I New Central Book Agency (P) Ltd., 8/1 Chintamani Das Lane, Calcutta.

11. Erwin Kreyszig : Advanced Engineering Mathematics (Fifth Edition), Wiley Eastern Ltd., New Delhi.

401. Physical Chemistry

Teaching Scheme		Examination Scheme						
Th.	Tu/pr	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	25	25	200

1. Chemical Kinetics : Rate of Reaction - Effect of time concentration etc. on the rate of reaction. Order and molecularity - Methods of determination of order of reaction - Pseudo unimolecular - Zero order reaction.
2. Phase rule (statement and definition) Application of phase rule to one component system (water and sulfur) Two component system, solid-liquid system (Eutectic compound solid solution formation Liquid-Liquid system (miscible and immiscible) Solvent extraction fractional distillation, Distillation (azeotripic and azeotropic systems). Deviation of Gibbs Phase rule Simple three components system. Application of phase rule to solid-liquid and Liquid-Liquid system.
3. Thermodynamics - First law of thermodynamics Application to compressor and expansion of ... Second law of Thermodynamics concept of entropy. Third law of thermodynamics entropy change in compressor, expansion chemical reaction and mixing.

   Concept of free energy criteria from spontanery of reaction. Gibbs Hemholtz partial molal properties Chemical potentials concept of activity and fugacity. Criteria for phase equilibrium Gibbs-duhem equation.

   Introduction to statistical and thermodynamics Maxwell Boltzmann distribution partial functions Entropy and free energy function Sackur-Tetrode equation.
4. Thermochmistry - Standard heat of formation, Standard Free energy of formation. Variation heat of reaction and free energy change of reaction with temperature and pressure.
5. Electro-chemistry - Laws of electrolysis, Electrolystic Measurement and application of transport number Ionic mobility strong and weak electrolyte. Interionic attraction theory Debye Huckle theory concept of ph, buffer solutions. Concept of acidity and basicity.

   Electromotive force, Electrolytic and galvanic cells types of electrodes and electrode reactions determination of standard E.M.F. electrode oxidation potential, reversible electrode and half cell reactions.
6. Surface Chemistry - Absorption and chemisorption, Absorption isotherms. Surface area of solids absorption from solution Chemisorption and Catalysis.
7. Colloids - Classification and properties of colloids, emulsions detergenics, miscellaneous gels ... Aerosol Industrial applications.

Practical and Term-work :

Practical work based on (i) chemical kinetics (ii) Thermo chemistry (iii) Surface chemistry (iv) Instrumental methods of chemical analysis etc.

Books :

(1) Physical chemistry : "Samul Glastone"
(2) Modern physical chemistry : "A J Mee"
(3) Physical chemistry : "Bahl & Tuli"
(4) Physical chemistry : "P. L. Soni & Dharma"

402. Organic-Chemistry

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	3	100	3	50	25	25	200

1. Organic reactions and their Mechanisms. Types of bond, hybridization, Types of reactions, and their mechanism.
2. Alkenes : Geometrical isomerism, Markownicobb rule, anti markownicobb rule. Types of dienes and characteristics, Polymerization.
3. Alkyl halides : SN, SN reactions. E and E Mechanisms. Gignard reagents and their importance.
4. Stereochemistry : Stereochemistry of compounds having, two asymmetric carbon atoms, Walden inversion etc.
5. Carboxylic acid : Mechanism of esterification and hydrolysis Tantomerism Preparation of ethyl acetoacetic ester and importance in organic synthesis.
6. Chemistry of organic compounds such as : Chloroform, carbon tetrachloride, ethyalalcohol, methyalalcohol, acetone, Acetic anhydride, Formaldehyde, acetic acid, EDTA etc.
7. Petrochemicals : Chemicals derived from petroleum products-Methane, Ethylene, Propane, etc.
8. Carbohydrates : Carbohydrates and classifications stru & Chemical reactions of Glucose, Fructose, & Starch, etc.
9. Synthetic applications and reaction Mechanism of following reactions-Alchohol, Canizaro, Stobe, Perkin, Reformatsky, Michael, Dieckmann, Welf-kishaner, Lucard reactions.
10. Preparation, Properties and reaction mechanism of follarj-Anyl halde, Nitrobenzene, Aromatic amine, Pheners aromatic sulfuric and carboxylic acids, Diazocompounds and importance

    Polynuclear aromatic compounds : Chemistry of Naphthalene, and their derivatives

    Chemistry of Heterocyclic compounds - Contains five membered and six membered rings

    Aromatic compounds and aromacity Huck's rule, Structure of Benzene Aromatic substitution electrophilic and Nuoleophilic reactions and their mechanism

Practical and Term-work :

Identification of organic compounds.
Estimation of organic compounds
Determination of saponification, Iodine, acid and ester value
Determination of Equivalent weight of an organic acid
Separation of purification of Binary organic mixtures
Preparation of some organic compounds
(1) Acetanilide (2) Dinitro benzene (3) Azo dye etc

Books :

(1) Organic Chemistry Vol I & II By I. L. Finar
(2) Organic Chemistry-Hendro son and Hamannd
(3) Advanced Organic Chemistry : by Jerry March
(4) Organic Chemistry : by P. L. Soni

403. Chemical Process Industries - I

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	25	25	200

1. Water : Water treatment for industrial and domestic use such as demineralisation, deionisation, desalination, reverse osomosis Sewage water and inds waste water treatment and disposal management
2. Fuels and Combustion : Types of fuels, proximate analysis ultimate analysis, Cocking and distillation of coal, hydrogenation of coal, properties of fuels, alternatives availability, furnace and burner design, testing

3. Energy and its alternate sources : Liquid and gaseous fuels, water gas, producer gas, forms and sources of energy, Nuclear energy, molecular reaction. Energy from unconventional sources such as solar energy, bio-mass, wind energy, OTEC etc.
4. Oils, Fats, Waxes, Soaps and detergents : Vegetable oils, soyabean oil by extraction, Animal fats, processing of animal fats and oils. Hydrogenation, Waxes, Detergents, Raw materials Manufacture of detergents, detergency, biodegradability of surfactants, fatty acids, Soaps, Glycerin.
5. Sulfur and Sulfuric acid . Mining of sulfur, manufacture of Sulfur and sulfuric acid by contact and DCDA process, its applications.

Manufacturing technologies, processes, properties, application, state of art with respect to technology, economy, availability and use pattern for all above industry/products should be discussed.

Practical and Term-work :

Experiments based on the above topics for the testing, identification, analysis and preparations etc should be given to the students.

Books :

1 Sherve's Chemical Process Industries- George Austin
2 Outlines of Chemical Technology- Charles Dryden
3 General Chemical Technology- Shukla and Pandey

404. Process Calculations

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	1	100	4	50	-	-	150

1 Dimensions and units : Dimensions and system of units, Fundamental and derived units, Dimensional consistancy, Dimensional equations. Different ways of expressing units of quantities and physical constant.

2 Basic chemical calculations : Composition of gaseous mixtures, liquid mixtures, solids etc. Ideal gas laws and its application. Dalton law, Raoult's law, Henry's law, solubility and distribution coefficient humidity and saturation.

3 Material balance without chemical reactions : Process flowsheet, Material balance with and without recycle: Bypass, Purge streams, Material around equipments related unit operations like absorber and stripper, Distillation towers. Exractors. Dryers, Evaporators, Crystallizers, Humidification and dehumidification towers. Material balance of unsteady state operations like mixing (system consisting of gases, gas-liquid, gas-solid, liquid-liquid, liquid-solid, solid-solid should be covered)

4. Material balance with chemical reactions : Concept of limiting and excess reactants, precentage conversion and yield etc, material balance involving reactions with special reference to fertilizers, petrochemicals, dyestuffs, electochemical industries (system consisting of gaseous gas-liquid, gas-solid, liquid-liquid, solid-liquid, solid-solid should be covered)

5 Energy balances : Heat capacity of gases and gaseous mixtures, liquids & solids, Sensible heat change in liquid & gases, enthalpy changes during phase transformation, enthalpy changes accompained by chemical reactions, thermo-chemistry of mixing process, dissolution of solids etc. Liquid-liquid mixtures, heat of solution by partial molal quantities, Energy balance for systems with and without chemical reactions, Energy balance for nuclear, electrochemical, photochemical & biochemical processes.

6 Fuels and combustion : Types of fuels, calorific value of fuels, problems on combustion of coal, liquid fuels, gaseous fuel, sulphur and sulphur pyrites etc. Proximate and ultimate analysis, combustion calculations, theoretical flame temp. etc.

7 Plant utilities : Estimation of the requirements of steam, electricity, water, compressed air, vacuum etc

8 Typical industrial applications . Material and energy balance of industrial processes such as manufacturing alkylated, cement, fertilizers, effluent treatment systems etc.

Text books :

1. 'Stoichiometry' : B. I. Bhatt & S. M. Vora, McGraw Hill ltd, 1976.
2. 'Chemical process principles' Part-I : O. A. Hougen, K. M. Watson, John Wiley and asia Publication, 1970.

Reference Books :

1. 'Stoichiometry' for chemical engineers' : Williams & Johnson, McGraw Hill, Kogakusha ltd
2. 'SI Units in chemical engineering and Technology', D. Wenkateshwarlu, Chemical engineering education development centre, IIT.
3. 'Chemical engineering calculations' S. D. Shukla, G. N. Pandya, Lion press, Kanpur.

405. Process Heat Transfer

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	25	25	200

1. **Introduction to three modes of heat transfer :** Conduction convection & radiation. General laws of heat transfer.

2. **Conduction :** Fourier's law. Conductivity, its variation with temp & pressure and its relationship with electrical conductivity.

   Heat transfer through composite walls and cylinders.

   Unsteady state heat transfer through some important shapes.

   Insulating materials general properties & application.

3. **Natural convection :** Natural convection from vertical plates & horizontal cylinders.

   Forced convection : In laminar flow - Heat transfer in plate & in tubes. In turbulent flow- Empirical equations for individual coefficients : inside tubes, outside tubes, outside bundle of tubes, flow past spheres.

   Significance of Prandtl No., Nusselt No., Grashof No., Graetz No. & Peclet No

   Correction for tube length, Correction for heating and cooling and other corrections Various analogies between heat & momentum transfer.

4. **Radiation :** Radiation laws like Stefan Boltzman's law Kirchoff's law, Wien's law, Plank's law etc. Black body, Grey body. Transmitivity, Absorptivity, Reflectivity, Emissivity of black bodies and grey bodies. Application of thermal radiation : Radiation Transfer between surfaces. Radiation through semi transparent materials

5. **Heat transfer with phase change :** Boiling of liquids condensation of vapor. Filmwise & dropwise condensation. Weighted LMTD & Overall Heat transfer Coefficient for desuperheating & subcooling.

6. **Evaporation :** Performance of tubular evaporator. Individual & overall coefficients Capacity & economy of evaporators. Boiling point elevation. Duhring's rule. Effect of liquid head & friction on pressure drop. Types of evaporators.

   --Multiple effect evaporators.

   --Vapor recompression-Thermal recompression & mechanical recompression

7. **Heat Exchange equipments :** Double pipe heat exchangers

   Individual and overall heat transfer coefficient LMTD. Variable overall Heat transfer coefficient fouling factors.

   Shell & tube heat exchangers LMTD correction factors. General constructions

   Extended surface equipment Fin efficiency. Fin effectiveness. Calculations of overall heat transfer coefficient for extended surface heat exchangers.

   --Agitated vessels

   --Scrapped surface exchangers

   --Heat transfer through fluidized beds.

8. **Industrial furnaces.**

Text books :

1. "Heat Transmission" : W. H. McAdams, McGraw Hill, 3rd Edition.
2. "Process Heat Transfer" : D. Q. Kern, McGraw Hill.
3. "Fundamentals of Heat Transfer": M. Mikheyev, Mir Publications.

Reference Books :

1. "Unit operation of Chemical Engineering": W. L. McCabe and J. C. Smith, McGraw Hill, 3rd Edition., 1976.
2. "Principles of unit operation" : A. S. Foust et al, Wiley International, 1960.

Practical and Termwork :

Experiments related to conduction, convection, radiation, evaporation, industrial furnaces etc.

Ru. 501. PRINCIPLES OF THERMODYNAMICS

Teaching Scheme		*Examination Scheme*						
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	1	100	3	50	-	-	150

1. **Introduction :**

   Conservation of energy and first law of thermodynamics, application to steady state flow process; enthalpy, internal energy, equilibrium state, phase rule, irreversible vs. reversible process, heat capacity and specific heat.

2. **Properties of pure substances :**

   PVT behaviour of pure substances, ideal and non-ideal gases, equation of states, Virial, Van der Waals, Be rthelot equ.etc. Calculation of constants in terms of Pc, Tc, Vc, Condition to be satisfied by any equation of state, reduced forms of equations of state, principles of corresponding states.

3. **Heat effects :**

   Heat capacities of gases as a function of temperature, Heat capacities of gases, liquids and solids, Concept of Cpm, Heat of vaporization, Heat of fusion, Heat of sublimation, Heat of formation, Laws of thermochemistry, Heat of combution, kHf from kHc, kHr, from kHf etc., thermoneutrality of salt solution, Heat formation of ions and atoms, Heat of solution, Heat of formation of compound in solution, Heat of solution of hydrate, Heat of mixing and enthalpy concentration diagrams.

4. **Second Law of thermodynamics :**

   Second law of thermodynamics, Thermodynamic temperature scale, Ideal gas temperature scale, Concept of entropy, entropy change and irreversibility, Introduction to third law of thermodynamics.

5. **Thermodynamic properties of fluids :**

   Network of thermodynamic equations, mathematical relations among thermodynamic functions, Maxwell relations, Interrelations between H, S, G, E, Cp, Cv, etc. in terms of PVT relations (exhaustive treatment), Thermodynamic properties of single phase and two phase systems, Effect of temperature and pressure, on various properties and their evaluations, Types of thermodynamic diagrams, generalized correlations of thermodynamics properties of ideal gas mixtures.

6. **Thermodynamics of flow process :**

   Fundamental equations and relationships flow in pipes, maximum velocity in pipe flow, nozzles, Single and Multistage compressors, ejectors.

7. **Refrigeration and liquification :**

   Carnot refrigeration cycle, Air refrigeration cycle, Vapour compression cycle, Absorption refrigeration, Heat pump, liquefication processes, Refrigeration through solar energy.

Text-book

1. 'Introduction to chemical engineering thermodynamics', J. M. Smith and H. C. VanNess, Kogadusha and McGraw Hill Co.
2. 'Chemical Thermodynamics', M. Kh. Karapetyants, Mir Publishers.
3. 'Chemical Engineering Thermodynamics', B. F. Dodge McGraw Hill.
   'Thermodynamics for Chemical Engineers', H. C. Weber and J. P. Meissner, Wilay Eastern.

Ru. 502. VULCANIZATION

Teaching Scheme		*Examination Scheme*						
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	2	100	3	50	50	25	225

* Introduction
* Sulphur Vulcanization
  -Practical systems for Natural & Synthetic Olefin Rubbers
  -Theory of Sulpher vulcanization
* Non-sulphur vulcanizing systems for olefin Rubbers
* Non sulphur vulcanizing agents for Non-olefin Rubbers
  -Metalic oxides, Polyfunctional amines, pyroxides, polyacryllates, Silicone Rubbers, Fluorocarbon Rubbers.
* The assessment of state of vulcanization.
  -Theoritical study of degree of cross linking.
  -Practical assessment of state of cure.
* Discussion of methods of measuring cure.
* Calculation of cure in thick articles.
* The relation between curing system type & properties (Sulphur poly olefins Rubbers)

Practical & Term work :

-Based on above topics

Books :

-Rubber Technology & Manufacture by Blow & Hepburn.
-Rubber Processing & Production Organization by Philip K. Freakley

Ru. 503. RUBBER TECHNOLOGY-I

Teaching Scheme		*Examination Scheme*						
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	4	100	3	50	25	25	200

* Introduction : History, concept of monomer, polymer, polymerisation classification etc.
* Addition polymerisation : (Chain polymerisation) Free radical, cationic, anionic, co-ordination polymerisation, use of Zigler-Natta catalyst.
* Condensation polymersation : (Step polymerisation) Type of condensation, Reaction polycondensation, Ring opening polymerisation, miscellaneous polymerisation reactions.
* Polymerisation techniques : Bulk polymerisation, solution polymerisation, suspension polymerisation, emulsion polymersation, melt etc.
* Chemical & Geometrical structure : Microstructure based on chemical structure, microstructure used on Geometrical structure.
* Glass Transition Temperature : Introduction, Glassy solids & Glass Transition, Transitions & associated properties, factors influencing the Glass Transition temperature, Glass Transition temperature and plasticisers etc.
* Polymer Degradation : Introduction, Types of degradation, thermal degradation, mechanical degradation, ultra sonic waves, photodegradation, degradation by high energy radiation, oxidative degradation, hydrolytic degration.
* Polymer Reactions : Introduction, hydrolysis, acidolysis, aminolysis, hydrogenation, addition and substitution reactions, cyclisation reactions etc.
* Experimental methods : Polymer synthesis, isolation & purification of polymers, polymer fractionation, determination of glass transition temp. etc.

Books :

- Polymer Science by G. V. Govrikar
- Polymer Science & technology of Plastics & Rubber by Ghosh

Reference Books

- Chemical Process Industries by Shreve

Ru. 504. RUBBER PROCESSING -I

Teaching Scheme		Examination Scheme					
Th	Tu pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	50	50	250

- INTRODUCTION :

  Different kind of Processing Terminologies, Introduction to Rubber Rheology & processing.

- Rheology

  Newtonian & Non-Newtonian fluids Time dependent & time independent non-newtonian fluids, Bringham model, newtonian laws, power law model, modeling of Birmingham & power law model fluids, flowing over flat surface & circular pipes.

  Stress - strain characteristics of solids and polymers : Hook's equation, Newton's equation, Maxwell's equation, model for viscoelasticity, Voigt's model for viscoelasticity, deformation behaviour of polymeric & rubber materials, relaxation & retardation material.

  Shear thinning & shear thicking systems : Molecular mechanism of shear response & flow (polymer melts, paste, solution & emulsions), dependence of shear modules with temp., molecular/segmental deformation at different zones & transitions.

  Relevance of Rheological studies with rubber processing : Compression, transfer, injection, injection mouldings, extrusion clandering.

  Control of Rheological characteristics of rubbers through compounding in control of performance, characteristics of end products.

  Equipments for Rheological studies like mooney viscometer, Brookfield viscometer etc.

- Compounding :

  ADDITIVES :

  Plastisizers, Extenders, Colours & Pigments, Blowing agents, Accelerators, Activators, Retarders, Anti oxidents, Antidegradants, Non-Black Fillers, Special purpose additives.

  Carbon Black :

  Introduction, Properties, Rubber compound aspects, Furnace process, Thermal process channel or impringement process, Lampblack process, Particles size, Structure, Particle porousity, Classification.

  Art of compounding :

  Calculation of compound cost of a receipe, Calculation of compound volume of a reciepe, Calculation of compound specific gravity of a reciepe, formulation of mix, Processing requirments.

  Princple of Compounding :

  Introduction, The ingrediants & formulation of a mix, Compounding to meet processing requirements, Compounding of vulcanize properties, Compounding for bounding to non-rubber substrates.

  Reinforcement by fillers :

  Introduction, reinforcement, Factors infullancing elastomers reinforcement, fillers characteristics, main effects of fillers, characteristics of vulcanize properties, Infulence of fillers characteristics on the cross linking process, Filler in corporation, the roll of bound rubber, reinforcement and cross link density, The mechanisium of reinforcement & its applications.

- Processing behaviour of NR, SR, & Latex processing techniques like mixing, mastication, moulding, callendering, extrustion, injection moulding.

Books :

1. Polymer Science by G. V. Gowarikar
2. Natural Rubber Science & Technology by Roberts
3. Hand book of Rubber Projects, Technology & Product formulary By : SBP Consultants & Engineers (P) Ltd.
4. Rubber Technology & Manufacturing. By : C. M. Blow

Ru. 505. RUBBER ENGINEERING - I

(Rubber processing Equipments & processing Techniques)

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	50	50	50	250

- MIXING MILL :

  Open mill mixer-internal mixer-semi continuous & automatic mixing equipments, single geared & double geared mills, energy & economic consideration, Knewlers, Transfer mix, Banbury mixer, Tandem mixing.

- CALENDERS :

  Types & sizes of typical machines, roll configurations, roll cambering, single trip & double rip arrangements for sheeting, equipments for coating of textile fabrics, friction coating, axis crossing devices, roll bending etc.

- EXTRUDERS :

  Ram type & screw type extruders, hot & cold feed extrusion direct powder extruders, effects of screw length/dia ratio, temp.control & ancillary equipment, extruder drives & power rating, machine selection.

- MOULDING MACHINE :

  Blank preparation for moulding, Blank heating methods, injection moulding machine, types, screw & ram type machines, vertical injection moulding machines ejection techniques, compression moulding machines, transfer moulding machine.

- HAND BUILDING & FORMING EQUIPMENTS :

  Equipments for tank & pipe lining, roller covering, low pressure unreinforced hoses making.

- VULCANIZATION EQUIPMENTS :

  Equipments for Volume by methods other than moulding, autoclave, curing methods, equipments for continuous vol. hot air tunnel, molten salt bath, fluidised bed, microvave curing.

- FINISHING OF RUBBER COMPONENTS :

  Equipments for flash & spew removal, hand riming, roller trim, buffing, low temp tumbling, punching, grinding, shot blasting, painting & lacquering.

- Latex processing & testing equipments Planatery mixer, turbo mixer, Jar mill, Indentation hardness tester, lox resistance tester, Mechanical stability, Latex tester.

- SAFETY IN THE USE OF RUBBER MACHINERY :

  Construction, use & maintenance of guards, fixed guards, interlocked guarding, trip devices, photo electric & pressure sensitive devices, maintenance of guards

Books :

1. Rubber Technology & Manufacturing : by C. M. Blow
2. Calendering & Extrusion Technology by : Arun V. Apte

Ru. 601. RUBBER EQUIPMENT DESIGN - I

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	4	100	3	50	50	25	225

- DESIGN OF MIXING MILLS :

  -Mixing mills & internal mixer, Control of mixing newer methods including continuous mixing, relative merits & their uses.

  -Design aspects of mixing mills & internal mixers, automation controls, dispersion requirements & characteristics.

  -Safety-human aspects, machine aspects.

  -Mixing equipments lay-out, organization & capabilities.

  -Capital & running costs of various systems.

  -Exercises in design & drawing of mixing mills.

- DESIGN OF HYDRAULIC PRESS :

  Major components, Process design & Mechanical design, part design

* DESIGN OF CALENDERING MACHINES :

  -Process controls.

  Temp. controls by use of cold water, hot water, steam etc., centrally & paripheraling drilled rolls, control of product thickness, non-Newtonian behaviours of rubber comp methods used for thickness control.

  -Roll design.

  -Calculation of roll separating force.

  -Calculation of roll deflection.

  -Specification of calender machine.

* DESIGN OF AUTOCLAVE :

  Major components, Process design & Mechanical design.

Books :

1. Rubber Products Manufacturing Technology By : Anil K. Bhowmick
2. Rubber Processing & Production Organisation By : Philip K. Freakley.
3. Calendering & Extrusion Technology By : Arun V. Apte.

Ru. 602. RUBBER IND. MANAGEMENT & ECONOMICS

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	-	100	3	50	-	-	150

* The historical background of industrial development fundamentals of management economics production capital-specification, integration, monopoly, markets & exchange, the stock exchange, value & price distribution, vague & welfare, Fundamental consideration in industry, Basic management decisions, plant location etc.
* INDUSTRIAL ORGANISATION : Forms of Business enterprises, Organisational structure line, Staff line & staff organisation, function & responsibilities.

  Organisation development & types of organisation, Co-ordination & moral, Product development & research, simplification & standarisation of product & materials, processed & material inspection, productivity, profit & human relations.
* PERSONNEL MANAGEMENT : Functions of personnel department, Manpower planning, job design & Evaluation, Recruitment, Selection, Induction & Training.
* Individual needs & motives, Theories of work motivation, Group & inter group process, Managing conflicts & resistance to changes.
* Wages, Plans, incentives, job evaluation, Trade unions & their functions, industrial fatigue & accidents causes & remedial measures. Business ethics & social responsibilities.
* SOURCE OF FINANCE : Own capital, Loan from Financial Institutions, Equity & preferencial shares, Debt Issues Working capital Finance Etc.
* The sales & purchase departments. Budget, managerial control & office administration, Classification & identification, Material production control, Routing, Scheduling & mass production industries, Business statistics, index numbers, charting, ratio- forecasting, quality control, ISO 9000 concept, comparison of indian scenario with various models in highly developed countries.
* ELEMENTS OF ECONOMICS : Laws of scarcity, diminishing return & increasing costs, Capital & labour, Depreciation & taxes, Investment criteria, Business cycles & forecasting Banking system installation. Basic economic concepts, Demand, Supply loan & grants, Economic planning etc.

Ru. 603. RUBBER TECHNOLOGY-II

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	4	100	3	50	50	25	225

* Introduction to NR, SR & thermoplastic rubber, NR structure, dry rubber preparation, modern forms of NR, properties of NR, Rubber derivatives, modified rubbers, technically specified rubber, vulcanization systems of NR.

* Chemical modification of natural rubber : Introduction, modification, research, chemical reactivity of NR simple addition reaction of olefins, double bond, electrocyclic reactions, degradation reaction.
* Graft copolymers from natural rubber : Introduction, thermoplastics, rubber grafting chemistry, physical properties of polyestrene graft copolymers, grafting of other backbones, graft chains other than polyestrene, alternative grafting, heavyplus material & related material.
* Diffusion of liquids & solids in rubber : Introduction, diffusion theory, experimental methods, diffusion of hydrocarbon liquids & oils,blooming of waxes, diffusion of water in rubber, practical relequance.
* Crystalinty in Polymers : Crystalline solids & their behaviour towards x-rays, polymers & x-ray diffraction, degree of crystallinity, crystallnity etc. Low temperature crystallisation in NR Crystallisationn NR theories, experimental techniques, tensile strain, compression, shear, crystallisation in bridge bearing.
* Reclaim rubber : Introduction, types of reclaim rubber, different manufacturing process of reclaim rubber, applications of reclaim rubber.
* Rubber adhesives : Selection of solvent, formulations, advantages of latex adhesives over rubber solution.
* Blends of natural rubber with thermoplastics : Introduction, preparation of TPNR blends, soft blends, hard blends, applications.

Books :

1. Natural Rubber Science & Technologyby : Roberts.
2. Hand book of Rubber Projects, Tech. & Product Formulary by : SBP Consultants & Engineers (P) Ltd.

Ru. 604. RUBBER PROCESSING - II

(Latex and latex goods)

Teaching Scheme		Examination Scheme					
Th	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	4	100	3	50	50	50	250

* LATEX TAPPING & CONCENTRATION METHODS : Theory of creaming & centrifuging. Standrads for centrifuged Concentrated latex, Parameters, Significance of Specification limits, Test methods theory & practice, Preparation of emulsion and dispersion of stabilizers, Compound ingrdiants, Vol. agents, All anti-oxidants & Fillers.
* FUNDAMENTAL LATEX CHARACTERISTICS : Particle size & distribution, Stability & destabilisation of lattices, Coacerration, viscosity, concentration relationship, surface, free energy & wetting behavior, zeta-potential, electrical prop. of colloidal systems, thermal measurement of molecules, kinetics of brownian motion.
* NATURAL LATEX COLLOID : Preservative, redox-potential changes, degradation lending to volatile fatty acid formation, constitution of fresh & ammonia preserved NR latex, prop of centrifuged latex as required for foam & dipped goods mfg. synthetic latexes.
* GELATION OF NATURAL LATEX : Zinc oxide solubility with pH, Heat gelling systems. Delayed action gelling system using sodium silicofluoride, significance of pH/time gelation cure foaming, frothing time cure, foam, viscosity, delayed action gelling.
* STABILITY TESTS FOR NATURAL LATEX, MECHANICAL & CHEMICAL . KOH number test, [illegible] oxide viscosity test, zinc oxide thickening test, kalaxon stability tester mechanical stability test, Determination of gelling pH.
* MANUFACTURE OF FOAM RUBBER : Preparation of latex, Compounding, maturing, batch foaming process, selection of mould, mould filling continuous foaming, gelling, vulcanising, drying,talo-cay process. & other mfg. process. physical pro of dry.
* LATEX DIPPED GOODS : Outline of dipping process, dipping methods, production of articles like gloves-balloons etc. Mfg. process. Articles & specification tests.
* LATEX-THREAD : Compounding, formulations. Mfg process.
* LATEX CASTING & MOULDING : Slush moulding, Rotational moulding, casting with porous & non-porous moulds compounding.
* LATEX COATING : Rubberised fabrics, Carpet bedding, artificial valvet, upholtery fabric backing.

Books :

1. Natural Rubber Science & Technology By : Rorberts.
2. Hand book of Rubber Projects. Tech. & Product Formulary. By : SBP Consultants & Engineers (P) Ltd.

Ru. 605. RUBBER ENGINEERING - II
(Testing of Latex and Rubber)

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	50	250

* TEST OF NATURAL & SYNTHETIC RUBBER : Plasticity, Scorch & Cure rate, tack, Plasticity, Retention index, Determination of Sp.Gr. Green Strength, Shirinkage
* CONTROL & SERVICE TESTING : Need for standardisation-viscosity, scorch, instruments used & their calibration, optimum cure & the use of curometer.
* Determination stress strain prop.(Tensile, Compression & shear) Abrasion Resistance, Tear strength, Hardness.
* Flex-cracking & cut growth, Hysteresis, Fatigue test, set, Rebound resilience, volume swelling, influence of temp. on prop. creep & stress relaxation, law temp. tests.
* PERMEABILITY : Resistance to Determination, Aging rubber to textile adhesion, Rubber to metal bond, Dynamic tests, all aging tests, Brittleness point, impact strength of Ebonite.
* ELECTRICAL TEST : Volume, surface resistivity, Dielectric strength, Dielectric const, Power tester, Carona resistance.
* TEST FOR LATEX : Total solids, Dry rubber content, Total alkalinity, viscosity, coagumn content, sludge content, pH, KOH rubber, Mechanical stability, VFA number, Surface tension, Determination of mooney viscosity of contained polymer, Determination of rubber styrene of contained polymer.
* Rubber from Natural Sources : Volatile matter-Dirt-Ash content & analysis Acetone Extract, Nitrogen content, Plasticity Retention index, Rubber hydrocarbon.
* RUBBER PRODUCTS - 'Chemical Analysis' : Identification of Rubber, Polymer, Spot test & Pyrolysis, extract analysis, Total sulfur, Organic sulfur, In-organic sulfur, Free sulfur, Filler Analysis, Estimation of NR, IR, SBR, IIR, NER.
* YARNS-GENERAL : Appearance & grading of cotton yarns, Braking load & elongation, Co-efficient of friction-yarn to melts, yarns to yarn etc.
* FABRICS - GENERAL : Abrasion Resistance of textile fabrics, moisture content & moisture regain of fabrics, Stiffness of fabrics, Thickness of textile measurements.
* TYRE CORDS & TYRE FABRICS : Tyre cords, tire cord fabrics, tire fabrics other than tire cords, identification of yarns, adhesion test cord etc.

Books :

1. Testing of Rubber, By : Brown

Ru. 701. POLYMER REACTION ENGINEERING:

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	2	100	3	50	25	25	200

* INTRODUCTION : Introduction to Chemical kinetics, Classification of reactions, Variables, affecting rate of reaction, definitions of reaction rates.
* KINETICS OF HOMOGENOUS REACTIONS : Concentration derendant term of rate equation, single, multiple, elements & non-elementary reactions, molecules Hg & order of reaction. rate constant, representation of reaction rate, kinetic model & its testing, temp. dependent term of rate equation from Archeniun law, thermodynamics, collison theory, transition state theory, compression of theories, activation energy, searching mechanism, predictability of reaction rate.
* Interpretation of batch reactor data constant & variable volume batch irreversible 1st and 2nd order reactions, Integral & differential method of analysis, search for a rate equation.

* Introduction to heterogeneous reaction, kinetics rate equation for heterogeneous reactions, contacting patterns, illustrations of fluid particles & fluid-fluid reactions solid & catalyzed reaction.
* MOLECULAR WEIGHT & SIZE : Average number average, Weight average molecular weight, molecular weight and degree of polymerization, Molecular weight distribution in polymers, Practical significance of polymer molecular weight, size of polymer molecules
* KINETICS OF POLYMERIZATION : Introduction, free radical, cotionic, Amonic, Chain Polymerization kinetics, Kinetics of condensation reactions
* CO-POLYMERIZATION : Kinetics of free radical polymer & ionic Co-polymerization. Co-poly condensation.
* POLYMER REACTOR DESIGN : Introduction, ideal batch, mixed flows, plug flow, reactors, space time, space velocity, holding time mixed Vs. plug flow reactors 1st and 2nd order reaction.

Books :

-Polymer Reaction Engineering By : Anil Kumar

-Chemical Reaction Engineering By : Octave Levenspial

-Polymer Science & Technology By : By Gowarikar

Ru. 702. RUBBER PROCESSING- III

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	25	25	200

* CELLULAR RUBBER : Introduction, Difference between sponge & Expanded Rubber, Manufacturing of sponge rubber, Manufacture of expanded rubber.
* EBONITE RUBBER : Introduction, Properties, applications. Manufacturing of ebonite rod
* SPORTS GOOD : Tennis ball, Conventional ground golf ball, Solid golf ball
* HOSPITAL RUBBER GOODS : Comp. design, formulations. Manufacturing process of Hot vater bag, Rubber sheets, surgical tubing.
* RUBBER GASKET, WASHERS & SEATS : Prop. of seal materials, selection of Rubber for oil seals, Types of seals, methods of mfg.
* RUBBER BAND : Comp. design, Formulations, Mfg. process, limitations.
* RUBBER TO METAL BONDING : Metal cleaning, Application of bonding medium moulding testing of finished products Rubber lining Electro deposition of Rubber on metals
* RUBBER CABLES : Comp. design, Formulations, Mfg. process, causes remedies
* RUBBER ROLLERS : Introduction, Application, Method of Mfg.. Comp design, Diff types of rollers.
* PRINTING BLANKETS : Introduction, Comp. design. Method of mfg Practical problems Remedies, Applications etc.
* RUBBER IN AUTOMOBILE INDUSTRIES : Introduction, Automobile brake lines, brake chamber diaphragm, Formulation
* DEFENCE RUBBER ARTICLES : Introduction, Comp design, Procedure for Mfg Applications etc.
* Engineering application of Rubber.
* Processing of thermoplastic elastomers like polyolefin, Polyester, Polyurethane Block polymers etc.

Compounding thermoplastic elastomers for specific applications

Books :

1. Hand book of Rubber Project Tech. & Product Formulary By SBP Consultants & Engineers (P) Ltd.
2. Rubber Technology By : C. M. Blew.

Ru. 703. RUBBER TECHNOLOGY - III
(Synthetic Rubbers &Thermoplastic Elastomers)

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	[illegible]	[illegible]	[illegible]

* MONOMERS FOR SYNTHETIC RUBBER PRODUCTIONS : Butadyne stirene, akrlonitrile, isoprene, chloroprine, ethylene, propylene, isobutene, acryllic monomers, vinyl chloride, vinyl acetate.
* BUTADYNE POLYMERS & CO-POLYMERS : Introduction, emulsion polymerised stirene butadyne rubber, emulsion polymerised, acrylonitrile butadyne rubbers,emulsion polymerised rubbery terpolymers of stirene vinyl pyrdine & butadyne, Solution polymerised butadyne rubbers, Solution polymerised stirene butadyne rubbers.
* RUBBERS OBTAINED FROM BUTADYNE DERIVITIES : Introduction, Isoprene rubber, Chloroprene rubber.
* RUBBERS DERIVE FROM OLIFINES & FROM OLIFINES OXIDE : Introduction, Isobutene-Isoprene rubbers, Halogenated isobutane-isoprene rubber, EPM & EPDM rubber, CSM & CM rubbers. Polychloroprene : Properties, synthesis of polymers, oxidation & aging, Technological comparison of polychloroprenes.
* OTHER TYPES OF SYNTHETIC RUBBERS : Carboxylated rubbers, ACM rubbers, FKM rubbers, Urethane rubbers, Polypentenamer & Plasticised polynorbronene, TR rubbers, Nitroso rubbers, Inorganic rubbers, Hudrogel rubbers.
* NOVEL DEVELOPMENTS IN THE TECHNOLOGY OF SYNTHETIC RUBBERS : Introduction to Thermoplastic Elastomers, Thermoplastic elastomer vs. General elastomers, Polyolefin Thermoplastic elastomers. Polyester Thermoplastic elastomers. Polyurethane thermoplastic elastomers. Emerging TPE like ethylene Co-polymers, ionic TPE, Polysilicoxane based TPE, 1-2 Polybutadiene TPE. Current applications in footwear adhesives, Automobile, Impact modifications. Testing of TPE, Desirable improvements in TPE, Future of TPE compounds.
* PLASTICISED POLYVINYL CHLORIDE : Introduction, Plasticisation of polyvinyl chloride, Stabilisation of polyvinyl chloride, Polyvinyl chloride plastisols.
* OXIDATION PROPERTIES OF RUBBER : Oxidation of saturated & unsaturated hydrocarbous, sulphides & olefin, sulphide system, oxidation of diene rubber net work, theory of mastication & machnochemistry.

Books :

1. Synthetic Rubbers, their chemistry & Tech. By : D.C.Blackley.
2. Handbook of thermoplastic elastomer By : Benjamin M.Walker.

Ru. 704. RUBBER EQUIPMENT DESIGN - II

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	50	50	250

* MOULD DESIGN : Introduction, Materials for moulds, General considerations & computations, Mold shirnking cooling, Mold durability, Mold making processes and machines used. Planning of the mould lay-out partition line locations, nozzle runner, coring, air vents & other details, design of moulds for injection moulding, compression moulding & transfer moulding operation, calculation of machine capacity requirements.
* DIE DESIGN : Planning the general arrangements of the die, different parts, selection of dies for hot & cold extrusions, dies for extrusion of tube, pipe, & sheeting, machine capacity calculations.
* DESIGN OF EXTRUDER : Major components, Process design & mechanical design of single screw extruder, Part design.
* DESIGN OF INJECTION MOLDING MACHINE : Major components, Process design & Mechanical design.

Books :

1. Rubber Products Manufacturing Technology By : Anil K. Bhowmick
2. Rubber Processing & Production Organisation By : Philip K. Freakley.
3. Calendering & Extrusion Technology By : Arun V. Apte.
4. Extrusion Technology By : Rapra Report
5. Injection molding of Rubber By : M. A. Wheelary

Ru. 705. RUBBER PLANT & PROCESS ENGINEERING

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	-	100	3	50	-	-	150

* INDUSTRIAL SANITATION & HOUSEKEEPING.
* INDUSTRIAL SAFETY : General introduction, Safety science, Technology of hazard identification, Nature of fire & explosion & their Remedies, Safety in use of Rubber machinries & Equipments. Toxic hazards of Rubber Chemicals & their handling.
* INDUSTRIAL POLLUTION : Various types of Environmental pollution by Rubber Industries, Their impact & remedial measures.
* LOCATION & LAYOUTMENT : Factory location & layout, Plant location & layout, Equipment layout.
* Motion & time study-establishing time value of time study, processing & use of time study date.
* Introduction to project identification & Formulation for Rubber products.
* COST ESTIMATION & PROFITABILITY ANALYSIS : Costing, Fixed, Variable & over head costs, Job costing & Process costing, Product Cost, Cost analysis, balance sheet. Investment, Profitabilityanalysis, Balance sheet.

Books :

1. Rubber Processing & Production Organisation. By : Philip K. Frenkley
2. Toxic Hazards of Rubber Chemicals By : A. R. Nutt.

Ru. 706. Seminar/Minor Project

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
-	4	-	-	-	25	25	50

Under the above subject each student will be assigned one topic related to Rubber Technology field by the concerned staff member. The student will make an upto date literature survey/experiemental work with reference to topic assigned under the supervision of staff members and will submit two copies of the work. The student will present the work done in the from of a paper by giving a talk (to be followed by discussion) during the regular seminar periods.

The copies of the work submitted by the student will be evaluated as term work followed by viva of each candidate.

Ru. 707. Industrial Training

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
-	-	-	-	-	25	25	50

Training of individual student in any Rubber industry.

The duration of the inplant training will be of the order of 6-8 weeks during vacation of V and VI semesters. The student will be required to submit a report of the training to the concerned faculty. It will be evaluated as Term-work and viva.

Ru. 801. TYRE & TUBE TECHNOLOGY

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	50	25	225

* Introduction & Terminology production of variety of tyre in india & abroad.
* STRUCTURE OF THE PNEUMATIC TYRE : Functions of the pneumatic tyre, tube & rim assembly, Construction of tyre tread, casing & bead general features, Principles of Cross-ply, radial & bias-belted construction, tubeless tyre, Tyre construction, Methods, Cord path, Aspect ratio.
* TREAD DESIGN : Composition of tyre CB & non-black fillers, Comp for casing, tread & bead.

* TYRE CORD & CORD TO RUBBER BONDING : Physical prop. of tyre cords from cotton rayon, nylon etc outline of bonding methods, etc.
* BEAD CONSTRUCTION : Forces on beads & their measurement.
* Evaluation of tyres by machine tests. Contact pr & its relation to traction & wear, tyre steering & road interaction.
* General developments in material construction & performance Assessments. Tyre standards, Performance & design criteria for cycle, Motor cycle, automobile, truck, earthmover, air-craft & tubless tyre
* TUBES : Principles of tube design, mfg. tubes, extrusion valveing, joining, inflation & curing in presses, load testing.
* Types of valves & principles of valve design, long & short cores, Valve components & assembly, pressure retention.

Books :

1. Tyre Manufacturing & Engineering By : F. J. Kovac
2. Tyre Technology By : Tom French.

Ru. 802. BELTS, HOSE & FOOTWEAR TECHNOLOGY

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	50	25	225

* CONVEYER BELTING : Functions of Conveyer belting, Components, driving gear, idlers, Conveyer belt design, Choice of belt width & Spread, Elevator belt design.
* BELT CONSTRUCTION : Cover, Carcass & insulation, effect of textile components of performance, Belt selection, Belt joining, Care & maintenance of belting.
* POWER TRANSMISSION BELTS : Flat belts-vbelts-main types of power transmission belt-grooved v-forms, timing belts. out length belonging. flat belting, Belt tension, Cabled cord. Care & maintenance of power transmission belts.
* HOSES : Hose design & construction, Mfg. Process, Hose fittings & Couplings, Hydraulic assemblies. Hose Standardization testing & specification, care & maintenance of hose.
* FOOTWEAR : Various mfg. processes, types of adhesives, Preparation & testing of various adhesives like solvent based rubber, mfg. of various components like soles, insoles, footbed, counter, toe. puff, stiffeners, finishers etc. speciality.

Books :

1. Hand book of Rubber Projects, Tech & Product Formulary By : SBP Consultant & Engineers P Ltd.
2. Rubber Technology By : C. M. Blow.

Ru. 803. RUBBER ENGINEERING-III

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	50	25	225

(Instrumentation Process Control & Safety Management in Rubber Industries.)

* INSTRUMENTATION & PROCESS CONTROL : Industrial managements for measurement & Control of process variables such as temp., pressure, gas, Concentration. Sp.gravity, pH. liquid level, liquid flow, humidity etc., Principles of automatic control, Proportional, Integral & derivtive modes of control, elements of analogue & digital computer application, microprocessor control.
* SPECIFICATIONS : The writing of specifications, Materials, Subcomponents, Machine settings, Manual Operations, products.
* PROCESS-CAPABILITY STUDIES : Utility & General Considerations, Design of processing trails, Empirical modeling & statistical analysis of process performance, Representation & optimization of process performance, tolerance bands & process precision.
* PROCESS MONITORING : General considerations, temp. measurement pressure measurement, position, Displacement & viscosity measurement, product Dimensions & wt., energy & power measurement, Data acquisition system, Data analysis & presentation.

* PROCESS CONTROL : General consideration, Local automatic & closed-lopp control, adaptive control, sequence control, safety & machine integrity, computer control systems
* QUALITY CONTROL : General considerations, sampling inspection, patrol inspection & validation, subjective inspection etc.

Books :

-Rubber Processing & Production Organisation By : Philip K. Freakley
-Rubber Products Manufacturing Technology By : Anil K. Bhowmick
-Industrial Instrumentation By : Donald Eckman
-Automatic Process Control By : Donald Eckman

Ru. 804. RUBBER PROCESS COMPUTER AIDED DESIGN

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	50	25	225

* Algorithms for interpolation, extrapolation, least square fitting of polynomials, numerical differentiation & integration, solution of engineering/technological/design problems relating to polymer/monomer synthesis, polymeric reactions, polymer processing, polymer products etc. Introduction to graphics.

Books :

-Rubber Products Manufacturing Technology By : Anil K. Bhowmick
-Numerical Methods in Science and Engineering By : Dr. B. S. Grewal.

Ru. 805. Project

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
-	6	-	-	-	100	50	150

Each student is required to submit project report on the designing of a Rubber Processing Plant. The report will consist of important chapters such as the following

(i) Introduction
(ii) Literature Survey
(iii) Selection of process and porcess details with justification
(iv) Physic-chemical data and properties
(v) Material & Energy Calculation.
(vi) Process design of various equipments and optimum operting conditions
(vii) Fabrication drawing of one of the major equipments with all relevant necessary details
(viii) Other important consideration such as instrumentation and process control, plant layout, safety precautions etc.
(ix) Cost estimation & Profitibility analysis
(x) Conclusions

પરિશિષ્ટ "૩૪"

કામકાજ ક્રમાંક ૨ (૩૭)

TEACHING AND EXAMINATION SCHEME

REVISED Syllabus B.E. II. Semester (III & IV) (Chem; Rub; Pl) *(in force from Sept., 1997)*

Sub. No.	Name of Subject	Teaching Scheme Th	Tu/pr	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
301	Inorganic Chemistry	4	4	100	3	50	25	25	200
302	Fluid flow operations	3	4	100	3	50	25	25	200
303	Material Sci. & Tech.	3	1	100	3	50	-	-	150
304	Computer Programming	3	4	100	3	50	25	25	200
305	Maths-III	4	-	100	3	50	-	-	150
		17	13	500	-	250	75	75	900

REVISED

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
401	Physical Chemistry	3	3	100	3	50	25	25	200
402	Organic Chemistry	4	3	100	3	50	25	25	200
403	Chemical Pro. Inds.-I	3	3	100	3	50	25	25	200
404	Process Calculations	4	1	100	4	50	-	-	150
405	Proc. Heat Transfer	3	3	100	3	50	25	25	200
		17	13	500	-	250	100	100	950

Note: B.E.II Sem III & Sem IV are common for Chemical, Plastic & Rubber.

B.E.III Semester (5 & 6)(Chemical Engg.)

REVISED

Sub. No	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
501	Mass Tr. Oper.-I	3	4	100	3	50	50	50	250
502	Chemical Pro. Inds.-II	3	4	100	3	50	50	25	225
503.	Chem. Engg. Thermo-I	3	1	100	3	50	-	-	150
504.	Chem.Engg. Compu.	4	1	100	3	50	-	-	150
505.	Mech.Oper. & Part. Tech.	3	4	100	3	50	50	25	225
		16	14	500		250	150	100	1000

REVISED

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
601.	Mass Tr. Oper.-II	3	4	100	3	50	50	50	250
602.	Chem. Engg. Termo-II	3	1	100	3	50	-	-	150
603.	Enterpreneur Development	4	-	100	3	50	-	-	150
604.	Proc.Equip. Design-I	3	4	100	4	50	50	25	225
605	Inst.& Pr. Control	4	4	100	3	50	50	25	225
		17	13	500		250	150	100	1000

B.E.IV SEM VII (CHEMICAL) REVISED

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
701	Chemical Reaction Engg.-I	3	4	100	3	50	50	25	225
702.	Proc.Equip. Design-II	3	4	100	4	50	50	25	225
703.	Elective-I	3	4	100	3	50	50	50	250
704.	Chemical Engg. Eco. & Project Engg.	3	-	100	3	50	-	-	150
705.	Envmtl. Protection & Safty Magmt.	3	-	100	3	50	-	-	150
706.	Seminar	-	3	-	-	-	25	25	50
707	Inplant Training	-	-	-	-	-	25	25	50
		15	15	500		250	200	150	1100

B.E.IV SEM VIII (CHEMICAL) REVISED

Sub. No	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
801.	Chemical Reaction Engg.-II	4	3	100	3	50	50	25	225
802.	Transport Phenomena	3	3	100	3	50	50	50	250
803.	Elective-II	4	-	100	3	50	-	-	150
804.	CAD & Proc. Optimization	4	3	100	3	50	50	25	225
805	Project	-	6	-	-	-	100	50	150
		15	15	400		200	250	150	1000

Elective - I :

1. Fertiliser Technology
2. Petroleum Refining & Petrochemicals
3. Dyes & Intermediate
4. Food & Oil Technology
5. Modeling & Simulation

Elective - II :

1. Unit Process
2. Energy Technology
3. Biochemical Engineering
4. Cryogenic Engineering
5. Advance Seperation Techniques

Semi. III

301. Inorganic Chemistry

Teaching Scheme		Examination Scheme					
Th.	Tu pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	4	100	3	50	25	25	200

1. Atomic structure : Bohr's theory H atom Wave mechanics, schrodinger wave equation, Quantum Nos. distribution of electrons.
2. Periodic table : Modern periodic law and long from periodic table. Periodic tends in size, atomic radii, Electron affinity etc.
3. Nature of Chemical bonding : Ionic, co-valent, co-mote nate bond, and its properties. V.B. and M.O. Theory, Hydridization & resonancer, electron pair repulsion theory. H-bond, vander waal forces.
4. Metallurgical processes and metals : principles involved in concern of ores. extraction, refining and physical-Chemical properties of Iron, Steel. Ti. Al, Cu, Th, Uranium, Ni, Zn. and Ind. application.
5. Chemistry of Non-Transitional elements : H,N, P, S. and its compound.
6. Chemistry of complex salt . Werner's Co-ordination theory, isomerism complex, Chelation stability of complex. Theory of Co-ordinate bond in metal complex.
7. Inorganic reactions : Dissociation, addition, free radicals, substitution, exchange reactions and its mechanisms. oxi-red. reaction. Organometallic compounds and Inorganic polymers.

Practical Term-work :

Volumetric analysis : Preparation of standard solution. Acid-base,oxi-red., Orgentometric, complexo metric titration, Iodometric titration. Determination of Mn. from pyrolusite.

Gravimetric analysis : Determination of Fe, Ni, SO and Cl, analysis of Iron-alloy.

Preparation : (a) Chrome-Alum (b) Potash-Alum (c) Micro-cosmic salt (d) Cuprous coloride etc.

Books :

(1) Advan. Inorganic Chemistry - By Cotton & Wilkinson.
(2) Inorganic Chemistry - By Gilrith.
(3) Inorganic Chemistry - By P. L Soni

302. Fluid Flow Operations

Teaching Scheme		Examination Scheme					
Th	Tu pr	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	4	100	3	50	25	25	200

Nature of fluid. fluid statics, transport properties, boundary layer; drag force; mass velocity; average velocity. potential flow; streamlines etc

Reynold number and its significance, laminar and turbulent flow;

Equation of continuity, Bernoulli's equation, frictional losses in channels, Measurement of flow. Transportation of fluids; pumps, its characteristics and pump design; pipe fittings; fluid moving machinery. flow passed bodies. aerodynamics, Fluidization. Settling of solids, two phase gas-liquid flow in pipes, Handling and Storage of Fluids.

Dimensional Analysis

Practical and Term-work :

Experiments based on metering devices such as venturimeter, orificemeter, rotameter etc.

Experiments based on Characteristics of pumps, fans, compressors etc.

Experiments based on measurements of pressure drops.

Study experiments on laminar and turbulent flow visualization.

Books :

1. Unit Operations of Chemical Engineering- W.L.Mccabe and J.C. Smith.
2. Chemical Engineering Vol. 1- Coulson and Richardson.
3. Fluid Dynamics and Heat Transfer- Knudson and Katz.

303. Material Science and Technology

Teaching Scheme		Examination Scheme					
Th.	Tu./pr.	Theory marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	4	100	3	50	—	—	200

1. Engg.Materials : classification, structure of solids, complex structures-polymorphism, amorphours and partly crystalline structures.
2. Phase Transformations & Phase Equilibria : phase transitions-solid solutions and intermetallic compounds, phase rule, cooling curves, phase equilibrium diagrams for solid solutions, phase transformations, phase equilibrium diagrams for alloy systems like steel, Cu-Zn, Cu-Sn, Cu-Ni, Cu-Ag, Cu-Al, Al-Si, Ni-Cr etc., Non-equilibrium cooling, Time-temp transformations and continous cooling transformations for alloys, heat treatments for alloys.
3. Polymers : Thermosetting and Thermoplastic polymers, structure property relationship in polymers, elastomers, polymer processing and reprocessing.
4. Corrosion : Importance for chemical Engg., classification of different types, basic mechanisms of corrosion, polarisations, factors influencing corrosion-environmental and internal factors, passivity.
5. Corrosion control & prevention : Protection by design, inhibitors, corrosion resistance of ferrous, copper, aluminium,nickel,titanium, lead etc. and their alloys in diferent conditions with effect of different alloying elements.
   —Cathodic protection
   —Anodic protection
   —Protective materials : corrosion resistant coatings, linings & cladding with types, techniques & applications.
6. Engg. Materials For Chemical Process Industries.
   —applications in different conditions for low carbon & low alloys steels, cast iron, stainless steel, nickel & alloys, copper & alloys, Al & alloys, Titanium & alloys, lead. glass, polymers, rubbers & elastomers, carbon & graphite etc.
7. Selection of materials for chemical industries :
   (a) Analysis of requirements (b) Selections of class of materials
   (c) Value analysis & final selections.
8. Recent trends in Chemical Engg. materials & composites.

Books :

1. Nature and properties of Engineering Materials- D. Zester Zebski
2. Engineering Physical Metallurgy- Yu Lakhtin.
3. Elements of material science- Van Wale.
4. The Science and Engineering of Materials- Donald R. Askland.

304. Computer Programming

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	4	100	3	50	25	25	200

1. Introducfion to computers : computer languages like machine language and high level languages, hardware terms etc.
2. Programming with Basic, C or other advanced developed languages with development of flow charts and algorithms.
3. Problems in process design, mathematical models for simple processes. programs for flowsheet, material and energy balances calculations.
4. Chemical Engg. application of scftware etc. The above topics should be discussed with respect to its application for chemical engg. and allied industries. Chemical Engg. problems should be discussed.

Practical and Term-work :

Experiments based on the above topics for the for preparing algorithms programmes etc. for various problems.Practice for operation of various ready made software and preparing tailor made software should be given during the laboratory hours. Exercises for computation and applications should be given based on the above topics

Books :

1 Computer primer- D.Rajaraman and V.Rajaraman
2 Computer Today- D.H. Sanders
3 Computer and common sense- R. Hunt and J. Shelly
4 Programming in ANSI C by E. Balaguruswamy OR Gottfried
6 Programming in Basic by E. Balaguruswamy OR Gottfried.

305. Mathematices-III

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	-	100	3	50	—	—	150

Syllabus of this subject is unchanged and is common with other branches of Engineering.

Semi. IV

401. Physical Chemistry

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	25	25	200

1. Chemical Kinetics : Rate of Reaction - Effect of time concentration etc. on the rate of reaction Order and moleculiarity - Methods of determination of order of reaction - Pseeudo unimolecular - Zero order reaction.
2. Phase rule (statement and definition) Application of phase rule to one component system (water and sulfur) Two component system, solid-liquid system (Eutectic compound solid solution formation Liquid-Liquid system (miscible and immiscible) Solvent extraction Fractional distillation, Distillation (azeotripic and azeotropic systems). Deviation of Gibbs Phase rule Simple three components system. Application of phase rule to solid-liquid and Liquid-Liquid system.
3. Thermodynamics - First law of thermodynamics Application to compressor and expansion of gases Second law of Thermodynamics concept of entropy. Third law of thermodynamics entropy change in compression expansion chemical reaction and mixing.

   Concept of free energy criteria from spontanery of reaction. Gibbs Hemholtz partial molal properties Chemical potentials concept of activity and fugacity. Criteria for phase equilibrium Gibbs-duhem equation.

   Introduction to statistical and thermodynamics Maxwell Boltzmann distribution partial functions Entropy and free energy function Sackur-Tetrode equation.
4. Thermochemistry - Standard heat of formation, Standard Free energy of formation. Variation heat of reaction and free energy change of reaction with temperature and pressure.
5. Electro-chemistry - Laws of electrolysis, Electrolstic Measurement and application of transport number. Ionic mobility strong and weak electrolyte. Interionic attraction theory Debye-Huckle theory concept of ph, buffer solutions. Concept of acidity and basicity.

   Electromotive force, Electrolytic and galvanic cells types of electrodes and electrode reactions determination of standard E.M.F. electrode oxidation potential, reversible electrode and half cell reactions.
6. Surface Chemistry - Absorption and chemisorption, Absorption isotherms. Surface area of solids absorption from solution. Chemisorption and Catalysis.
7. Colloids - Classification and properties of collbids, emulsions detergenics. miscellaneous gels foams Aerosol. Industrial applications.

Practical and Term-work :

Practical work based on (i) chemical kinetics (ii) Thermo chemistry (iii) Surface chemistry (iv) Instrumental methods of chemical analysis etc.

Books :

(i) Physical chemistry : "Semul Glastone"
(ii) Modern physical chemistry : "A J Mee"
(iii) Physical chemistry : "Bahi & Tuli"
(iv) Physical chemistry : "P. L. Soni & Dharma"

402. Organic-Chemistry

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	3	100	3	50	25	25	200

1. Organic reactions and their Mechanisms. Types of bond, hybndization, Types of reactions, and their mechanism.
2. Alkenes :Geometrical isomersism, Markownicobb rule, anti markownicobb rule, Types of dienes and characteristics, Polymerization.
3. Alkyl halides : SN, SN reactions. E and E Mechanisms. Gignand reagents and their importance.
4. Stereochemistry : Stereochemistry of compounds having. two asymmetric carbon atoms Walden. inversion etc.
5. Carboxylic acid : Mechanism of esterification and hydrolysis Tantomerism. Preparation of ethyl acetoacetic ester and importance in organic synthesis.
6. Chemistry of organic compounds such as: Chloroform. carbon tetrachloride, ethyalalcohol, methyalalcohol, acetone, Acetic anhydride, Formaldehyde, acetic acid, EDTA etc.
7. Petrochemicals : Chemicals derived from petroleum products-Methane, Ethylene, Propane, etc.
8. Carbohydrates : Carbohydrates and classifications stru & Chemical reactions of Glucose, Fructose, & Starch, etc.
9. Synthetic applications and reaction Mechanism of following reactions-Alchohol, Canizaro, Stobe, Perkin, Reformatsky, Michael, Dieckmann, Welf-kishaner, Lucard reactions
10. Preparation, Properties and reaction mechanism of follarj-Anyl halde, Nitrobenzene Aromatic amine, Pheners aromatic sulfuric and carboxylic acids, Diazocompounds and importance.

    Polynuclear aromatic compounds : Chemistry of Naphthalene, and their derivatives.

    Chemistry of Heterocyclic compounds - Contains five membered and six membered rings

    Aromatic compounds and aromacity Huck's rule, Structure of Benzene. Aromatic substitution electrophilic and Nuoteophilic reactions and their mechanism.

Practical and Term-work :

Identification of organic compounds.
Estimation of organic compounds
Determination of saponification, Iodine, acid and ester value
Determination of Equivalent weight of an organic acid.
Separation of purification of Binary organic mixtures.
Preparation of some organic compounds.
(1) Acetanilide (2) Dinitro benzene (3) Azo dye etc.

Books :

(1) Organic Chemistry Vol I & II By I.L.Finar
(2) Organic Chemistry : Fendro son and Hanannd.
(3) Advanced Organic Chemistry : by Jerry March
(4) Organic Chemistry : by P.L.Soni

403. Chemical Process Industries - I

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	25	25	200

1. Water : Water treatment for industrial and domestic use such as demineralisation deionisation, desalination. reverse osomosis. Sewage water and inds waste water treatment and dispoal management.
2. Fuels and Combustion : Types of fuels. proximate analysis ultimate analysis Cocking and distillation of coal, hydrogenation of coal, properties of fuels, alternatives availability, furnace and burner design, testing

[illegible] its alternate sources : Liquid and gaseous fuels, water gas, producer gas, forms [illegible] energy. Nuclear energy, molecular reaction, Energy from unconventional [illegible] solar energy, bio-mass, wind energy, OTEC etc.

[illegible] Fats, Waxes, Soaps and detergents : Vegetable oils, soyabean oil by extraction, Animal fats processing of animal fats and oils. Hydrogenation, Waxes, Detergents, Raw materials, Manufacture of detergents, detergency, biodegradability of surfactants, fatty acids, Soaps, [illegible]

Sulfur and Sulfuric acid : Mining of sulfur, manufacture of Sulfur and sulfuric acid by contact and DCDA process, its applications.

Manufacturing technologies, processes, properties, application, state of art with respect to [illegible] economy, availability and use pattern for all above industry/products should be [illegible]

Practical and Term-work :

[illegible] based on the above topics for the testing, identification, analysis and [illegible] should be given to the students.

Books :

1. [illegible]'s Chemical Process Industries : George Austin
[illegible] of Chemical Technology : Charles Dryden
[illegible] Technology : Shukla and Pandey

404. Process Calculations

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
[illegible]	[illegible]	100	4	50	—	—	150

[illegible] units : Dimensions and system of units, Fundamental and derived units, [illegible] Dimensional equations, Different ways of expressing units of [illegible] physical constant.

[illegible] calculations : Composition of gaseous mixtures, liquid mixtures, solids etc. [illegible] its application. Dalton law, Raoult's law, Henry's law, solubility and [illegible] coefficient humidity and saturation.

3. Material balance without chemical reactions : Process flowsheet, Material balance with and without recycle; Bypass, Purge streams, Material around equipments related unit operations like absorber and stripper, Distillation towers. Exractors, Dryers, Evaporators, Crystallizers, Humidification and dehumidification towers. Material balance of unsteady state operations like mixing (system consisting of gases, gas-liquid, gas-solid, liquid-liquid, liquid-solid, solid-solid should be covered).

4. Material balance with chemical reactions : Concept of limiting and excess reactants, percentage conversion and yield etc., material balance involving reactions with special reference to fertilizers, petrochemicals, dyestuffs, electochemical industries (system cosisting of gaseousgas-liquid, gas-solid, liquid-liquid, solid-liquid, solid-solid should be covered).

5. Energy balances : Heat capacity of gases and gaseous mixtures, liquids & solids, Sensible heat change in liquid & gases, enthalpy changes during phase transformation, enthalpy changes accompained by chemical reactions, thermo-chemistry of mixing process, dissolution of solids etc. Liquid-liquid mixtures, heat of solution by partial molal quantities, Energy balance for systems with and without chemical reactions, Energy balance for nuclear, electrochemical, photochemical & biochemical processes.

6. Fuels and combustion : Types of fuels, calorific value of fuels, problems on combustion of coal, liquid fuels, gaseous fuel, sulphur and sulphur pyrites etc. Froximate and ultimate analysis, combustion calculations, theoretical flame temp. etc.

7. Plant utilities : Estimation of the requirements of steam, electricity, water, compressed air, vacuum etc.

8. Typical industrial applications : Material and energy balance of industrial processes such as manufacturing alkylated, cement, fertilizers, effluent treatment systems etc.

Text books :

1. 'Stoichiometry' : B. I. Bhatt & S. M. Vora, McGraw Hill ltd, 1976.
2. 'Chemical process principles' Part-I : O. A. Hougen, K. M. Watson, John Wiley and asia Publication, 1970.

Reference Books :

1. 'Stoichiometry' for chemical engineers' : Williams & Johnson, McGraw Hill, Kogakusha ltd.
2. 'SI Units in chemical engineering and Technology', D. Wenkateshwarlu, Chemical engineering education development centre, IIT.
3. 'Chemical engineering calculations' S. D. Shukla, G. N. Pandya, Lion press, Kanpur.

405. Process Heat Transfer

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	3	100	3	50	25	25	200

1. **Introduction to three modes of heat transfer :** Conduction convection & radiation. General laws of heat transfer.
2. **Conduction :** Fourier's law. Conductivity, its variation with temp. & pressure and its relationship with electrical conductivity.
   Heat transfer through composite walls and cylinders.
   Unsteady state heat transfer through some important shapes.
   Insulating materials general properties & application.
3. **Natural convection :** Natural convection from vertical plates & horizontal cylinders.
   Forced convection : In laminar flow - Heat transfer in plate & in tubes. In turbulent flow-Empirical equations for individual coefficients : inside tubes, outside tubes, outside bundle of tubes, flow past spheres.
   Significance of Prandtl No., Nusselt No., Grashof No.,Graetz No. & Peclet No.
   Correction for tube length. Correction for heating and cooling and other corrections. Various analogies between heat & momentum transfer.
4. **Radiation :** Radiation laws like Stefan Boltzman's law, Kirchoff's law, Wien's law, Plank's law etc. Black body, Grey body. Transmitivity, Absorptivity, Reflectivity, Emissivity of black bodies and grey bodies. Application of thermal radiation : Radiation Transfer between surfaces. Radiation through semi transparent materials.
5. **Heat transfer with phase change :** Boiling of liquids condensation of vapor. Filmwise & dropwise condensation. Weighted LMTD & Overall Heat transfer Coefficient for desuperheating & subcooling.
6. **Evaporation :** Performance of tubular evaporator. Individual & overall coefficients. Capacity & economy of evaporators. Boiling point elevation. Duhring's rule, Effect of liquid head & friction on pressure drop. Types of evaporators.
   —Multiple effect evaporators.
   —Vapor recompression-Thermal recompression & mechanical recompression.
7. **Heat Exchange equipments :** Double pipe heat exchangers.
   Individual and overall heat transfer coefficient LMTD. Variable overall Heat transfer. coefficient fouling factors.
   Shell & tube heat exchangers . LMTD correction factors. General constructions
   Extended surface equipment. Fin efficiency. Fin effectiveness, Calculations of overall heat transfer coefficient for extended surface heat exchangers
   —Agitated vessels.
   —Scrapped surface exchangers.
   —Heat transfer through fluidized beds.
8. **Industrial furnaces.**

Text books :

1. "Heat Transmission" : W. H. McAdams, McGraw Hill, 3rd Edition
2. "Process Heat Transfer" : D. Q. Kern, McGraw Hill.
3. "Fundamentals of Heat Transfer" . M. Mikheyev, Mir Publications

Reference Books :

1. "Unit operation of Chemical Engineering" : W. L. McCabe and J. C. Smith, McGraw Hill, 3rd Edition., 1976.
2. "Principles of unit operation" : A. S. Foust et al, Wiley International, 1960.

Practical and Termwork :

Experiments related to conduction, convection, radiation, evaporation, industrial furnaces etc.

Semi. V

501. MASS TRANSFER OPERATIONS-I

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	4	100	3	50	50	50	250

1. Introduction to mass transfer operations.
2. Molecular & Eddy Diffusion in fluids : Estimation of diffusivities and mass transfer coefficient in laminar flow and turbulent flow their co-relations, analogies in transfer process. Simultaneous heat and mass transfer, phase relationship for absorption, distillation, drying & crystallization. Applications of Diffusion.
3. Inter phase mass transfer : Concept of overall mass transfer coefficient mass transfer in packed bed and fluidized bed concept of effective difusivity.

   Film, penetration and surface renewal theory, equilibrium.
4. Gas Absorption : Solubility of gasses in liquids, idea and non ideal solu. Choice of solvent for absorption, material balance and liquid gas ratio for absorption and stripping counter current multi stage operation (isothermal) continuous contact equipment introduction to multi component absorption, concept of HETP and HTU, NTU and jh factor. Industrial absorbers.
5. Liquid Liquid extraction & leaching : Ternay liquid liquid equilibrium and tie line data choice of solvent, single stage & multistage extraction. co-current and cross current extraction. Continuous counter current multistage extraction with and without reflux theory & performance of continuous contact equipments, single stage & multistage equipments. introduction to extraction with two solvents, applications of liquid extraction. Steady state and unsteady state leaching equipments, single stage leaching, multistage cross current and counter current leaching, rate of leaching, recovery of solvent vapors,application of leaching.
6. Mass transfer with Chemical Reactions : Mass transfer with chemical reaction in case of absorption, extraction leaching, introduction to back mixing in various contacting devices.

Text Books :

1. "Mass transfer operation" by R. E. Treybal, Mc-Graw Hill Kogakusha Ltd.
2. "Mass transfer with Chemical Reaction" by G Astavita Elsevier Co.
3. "Fundamentals of Mass Transfer" by V. Katarov, Mir publishers.

502. CHEMICAL PROCESS INDUSTRIES-II

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	4	100	3	50	50	25	225

1. Dyes and Intermediates : Classification of dyes according to constitution and application, various dyes such as Azo dyes, Anthroquione dyes, Triamyl dyes, dispersed dyes, Misc. dyes such as azine, oxazines, thiazines, thiazoles, nitro dyes etc.

   Various dye intermediates based on unit processes such as Nitration-Nitrobenzene, Reduction-Aniline, meta nitroaniline, Similarly for Amination for ammonolysis, Sulphonation, Halogenation, Hydrolysis, condensation, oxidation, alkylation etc.
2. Drugs and Pharmaceuticals : Classification as per chemical conversion, Various drugs and pharmaceuticals based on following unit processes—Alkylation-phenobarbital, barbital: Carboxylation, Dehydration, Halogenation, esterification, condensation, oxidation, sulfonation etc. Antibiotics such as penicillin, streptomycin etc.; Biological, steroids hormones, vitamins etc.
3. Chlor-alkali and Heavy Inorganic industry : Techniques and manufacture of Soda ash, Sodium bicarbonate, Chlorine, Caustic soda, bleaching powder and its applications.

4. Sugar, Paper, Paints, Pigments : Sugar, starch, pulp, rayon and paper chemicals, Acetic acid, methanol,ethanol by distillation, Paints, diff. types of pigments such as white, blue, red, yellow, green, brown etc Toner and lakes, Varnishes, lacquers, Inds. coatings. printing inks, inds.polishes etc.
5. Biotechnology and its application : Scope of biotechnology in modern industry, characteristics of biological materials, Application in manufacture of pharmaceuticals, chemicals methodologies transformation etc & fermentation products.

Practical and Term-work :

Experiments based on the above topics for the testing, identification, analysis and preparations etc. should be given to the students.

Books :

1. 'Sherve's chemical process industries' : George Austin.
2. 'Biotechnology, Chemical feedstocks and Energy utilization' : D. F. Gibbs.
3. 'Biochemical Engg. and biotechnology Handbook' : Atkinson.

503. CHEMICAL ENGINEERING THERMODYNAMICS-I

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	1	100	3	50	—	—	150

1. **Introduction :** Conservation of energy and first law of thermodynamics, application to steady state flow process; enthalpy, internal energy, equilibrium state, phase rule, irreversible vs reversible process, heat capacity and specific heat.
2. **Properties of pure substances :** PVT behaviour of pure substances, ideal and non-ideal gases, equation of states, Virial, Van der Waals, Be rthelot equ. etc. Calculation of constants in terms of Pc, Tc, Vc, Condition to be satisfied by any equation of state, reduced forms of equations of state, principles of corresponding states.
3. **Heat effects :** Heat capacities of gases as a function of temperature, Heat capacities of gases, liquids and solids, Concept of Cpm, Heat of vaporization, Heat of fusion, Heat of sublimation, Heat of formation, Laws of thermochemistry, Heat of combution, kHf from kHc, kHr, from kHf etc., thermoneutrality of salt solution, Heat formation of ions and atoms, Heat of solution, Heat of formation of compound in solution, Heat of solution of hydrate, Heat of mixing and enthalpy concentration diagrams.
4. **Second Law of thermodynamics :** Second law of thermodynamics, Thermodynamic temperature scale, Ideal gas temperature scale, Concept of entropy, entropy change and irreversibility, Introduction to third law of thermodynamics.
5. **Thermodynamic properties of fluids :** Network of thermodynamic equations, mathematical relations among thermodynamic functions, Maxwell relations, Interrelations between H, S, G, E, Cp, Cv, etc in terms of PVT relations (exhaustive treatment), Thermodynamic properties of single phase and two phase systems, Effect of temperature and pressure, on various properties and their evaluations, Types of thermodynamic diagrams, generalized correlations of thermodynamics properties of ideal gas mixtures.
6. **Thermodynamics flow process :** Fundamental equations and relationships flow in pipes, maximum velocity in pipe flow, nozzles, Single and Multistage compressors, ejectors
7. **Refrigeration and liquification :** Carnot refrigeration cycle, Air refrigeration cycle, Vapour compression cycle, Absorption refrigeration, Heat pump, liquification processes, Refrigeration through solar energy.

Text-book :

1. 'Introduction to chemical engineering thermodynamics', J. M. Smith and H. C. VanNess, Kogadusha and McGraw Hill Co.
2. 'Chemical Thermodynamics', M. Kh. Karapetyants, Mir Publishers.
3. 'Chemical Engineering Thermodynamics', B. F. Dodge McGraw Hill.
4. 'Thermodynamics for Chemical Engineers', H. C. Weber and J. P. Meissner Wiley Eastern

504. CHEMICAL ENGINEERING COMPUTATIONS

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr.*	*Theo marks*	*hr*	*Sess. marks*	*Pr. Oral marks*	*Term work*	*Total marks*
4	1	100	3	50	—	—	150

1. Introduction.
2. Numbers and Errors
3. Solution of Algebraic and Transcendental equations.
4. Solution of Simultaneous Algebraic Equations.
5. Matrix inversion and Eigen value problems.
6. Empirical laws and curve fittings.
7. Interpolation.
8. Numerical differentiation and Integration.
9. Numerical solution of ordinary differential equations and Partial differential equations.

For all above topics Chemical Engineering Application to be considered

Books :

1. 'Numerical Methods in Science and Engg.' Dr. B. S. Grewal.
2. 'Numerical methods' Sastri
3. 'Numerical Analysis' K. Kunz.

505. MECHANICAL OPERATIONS & PARTICULATE TECH.

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr.*	*Theo marks*	*hr*	*Sess marks*	*Pr. Oral marks*	*Term work*	*Total marks*
[illegible]	1	100	3	50	50	25	225

1. Solids and its flow properties
2. [illegible] management, Screening.
3. Fluidization and conveying
4. Filtration and sedimentation
5. Mixing and agitation.
6. [illegible] like elutriation [illegible] jigging, electrostatic and magnetic [illegible] classifier [illegible] etc

Practical and Term-work :

Experiments based on the above topics for the testing, identification, analysis and preparations etc. should be given to the students.

Books

1. 'Unit Operations of Chem Engg.' by W. L. McCabe & J. C. Smith
2. 'Introduction to Chemical Engineering' by W. L. Badger & J. T. Banchero.
3. 'Unit Operation' by Brown & Associates.

Semi. VI

601. MASS TRANSFER-II

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr. Oral marks*	*Term work*	*Total marks*
[illegible]	[illegible]	100	3	50	50	50	250

(I) Distillation :

Binary System : Introduction, Vapour-liquid equilibria, P-X-Y, T-X-Y diagrams, concept of volatility and effect of P and T on equilibrium data, Ideal solutions, Raoult's Law as applied to distillation operations, Deviation from ideality minimum and maximum boiling azeotropic mixtures, Enthalpy-concentration diagrams, their characteristics.

Flash distillation, steam distillation, simple distillation, continuous rectification, Batch fractionation etc., Determination of number of stages, by Ponchon and Severit method and McCabe Thiele method, multi tray towers, concept of minimum, total and optimum reflux ratio, Reboilers, use of open steam multiple feeds, partial condensers, cold hot circulating reflux etc. Rectification of azeotropic mixtures

Continuous contact equipments like packed towers sieve, bubble cap towers etc. Determination of no. of transfer units and height of transfer units.

Multicomponent System : Vapour-liquid equilibrium data, Definition of K etc ideal systems, limitations, Key components, Reflux, Lewis and Matheson calculations liquid-vapour ratio, method of Thiele and Geddes, Enthalpy balances for conventional columns, conventional method, Introduction to complex columns, convergence method, calculations of 'S', Material balance equation etc, Determination of minimum Reflux ratio for conventional and complex columns.

Use of efficiencies, Modified Murphee and vaporization efficiencies. Determination of plate efficiencies

Concept of A.S.T.M., T.B.P., azeotropic and extractive distillation, also molecular distillation

(II) Other operations :

1. **Humidification and dehumidification :** Vapour liquid equilibria, Enthalpy of saturated and unsaturated vapour liquid mixtures, adiabatic saturation curves, concept of wet bulb and dry bulb temp. Lewis relation, water cooling with air, Dehumidification of air-water vapour, water cooling towers.
2. **Absorption and ion exchange :** Types of absorption, Nature of absorbents, absorption equilibria, absorption of single gas/vapour from gaseous mixture, dilute and concentrated liquid solutions, fixed bed, ion-bed absorbers, principles of ion exchange. Equilibria and rate of ion exchange.
3. **Drying :** Equilibrium relationship. Drying operations and equipments, Equilibrium moisture, Bound moisture, unbound moisture, free moisture etc. Batch drying, rate of drying, time of drying, Cross-circulation drying, concept of NoG and HoG, Drying at low temperature, freez drying etc. Mechanism of various drying operations should be discussed in detail, continuous drying equipments-Tunnel dryers, Rotary dryers, Spray dryers etc
4. **Crystallization :** Saturation, nucleation, crystallization rate, effect of impurities, effect of temperature on solubility, caking of crystals, Batch crystallizers, continuous crystallizers
5. **Less conventional operations :** Introduction to fractional crystallization sublimation, foam separation, membrane separation, Thermal diffussion etc.

Books :

(1) 'Mass Transfer Operations', R. E.Treybel, McGraw Hill Publication

(2) 'Chemical Engg.' Vol. II, Richardson and Coulson, Pergamon Press

Reference Books :

(1) 'Fundamentals of Mass Transfer', V. Kafarov, Mir Publishers.

(2) 'Introduction to Chem.Engg.' Badger and Bencharo, McGraw Hill Publication

Practicals and Term Work :

Experiments related to Distillation, Humidification, Absorption Drying Crystallization etc

602. CHEMICAL ENGINEERING THERMODYNAMICS -II

Teaching Scheme		*Examination Scheme*					
Th.	*Tu pr.*	*Th. marks*	*hr*	*Sess marks*	*Pr. Oral marks*	*Term work*	*Total marks*
[illegible]	1	100	3	50	—	—	150

1. **THERMODYNAMIC PROPERTIES OF FLUIDS** (continued) : Partial Molar properties. Mathematical model for the chemical potential, Ideal and nonideal solutions, Fugacity, Pure component fugacity, Fugacity coefficient and its evaluation. Effect of Pressure and temperature of Fugacity, Fugacity of mixtures, Gibb's Duhem Theorem, composition in phase equilibrium.
2. **PHASE EQUILIBRIUM :** Criteria of Phase equilibrium, Duhem's theorem VL Equilibrium idealization, Phase diagram for Miscible systems, Immiscible systems, partial miscible systems. Testing of VLE data, Gibbs Duhem Equation, Van Laar equation, Margules equation, evaluation of various constants, Redlich Kister equation, modified form of Raoult's law modification, Excess properties of mixtures

Qualitative treatment for phase behaviour at low pressures [illegible] High pressures [illegible] diagram [illegible] treatment for phase behaviour [illegible] ideal solution [illegible] condensation, VL equilibrium of ideal and nonideal solution [illegible] Positive and Negative deviation. Construction of diagram [illegible]

Quantitative treatment for phase behaviour at high pressures, Evaluation of K and construction of K-charts.

Equilibrium relations for complex reactions with special reference to Petroleum Fractions, critical temperature and Pressure of Petroleum fractions. Concept of Phase diagram. Focal pressure and temperature of Petroleum fractions.

3. **Chemical Equilibrium** Criteria of chemical equilibrium. Equilibrium conversion Xe, Equilibrium constant. Effect of temperature and pressure on K, evaluation of K by various methods Evaluation of Xe, Calculations of Xe for exothermic, endothermic reversible, irreversible reaction and various combinations Thermodynamic analysis of some important technical reactions. introduction to liquid phase and heterogenous reactions, electrochemical reactions. equilibrium of complex reactions, simultaneous, consecutive reaction and various combinations, non-adiabatic reactions.

4. **Introduction to statistical thermodynamics and prediction method :** Basic concepts, fundamental postulates and their relationship to the three laws of classical thermodynamics, calculation of thermodynamic properties of ideal gas and perfect crystal. Intermolecular forces and the virial equation of state, simple theories of fluids, prediction of thermodynamic properties by group contributions methods, empirical and non empirical methods etc.

Text books

1. "Introduction to chemical engineering thermodynamics" : J. M. Smith and H. C. Van ness, McGraw Hill
2. "Chemical Engineering Thermodynamics" : B. F. Dodge, McGraw Hill
3. "Chemical Thermodynamics" : M. K. karapetyans, Mir Publishers.

603. ENTREPRENEURSHIP DEVELOPMENT & PRODUCTION MANAGEMENT

Teaching Scheme	Examination Scheme					
Th.	Theo. marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
	100	3	50	--	--	150

(A) Production Management :

(1) **The system Concept :** What is system, the production/operations functions as a system, the pom system as an open system, the system concept and the production/operation manager, Lessons to be absorbed, the transformation, the control process, self regulating systems feed back characteristics of feed back system, the law of requisite variety, large managerial system and self control, System Boundaries.

(2) **Decision making for POM system :** Introduction, the art of modelling processes, normative and descriptive system of analysis, the process analysis with examples, probabilistic models, continuous probability models, constrained dacision making

(3) **The Internal Environment :** Introduction the marketing system conflicting objectives, reducing system conflict, three different POM systems, other interphases, the marketing POM interphase the financial and accounting system, possible organisational roles for POM

(4) **Management and external environment :** Introduction, political legal economic factors sociological factors, determining the nature and direction of external environment of costing providing POM system flexibility in a dynamic environment

(5) **Forcasting for planning :** Purpose for forcasting, their timing, Technique for forcasting. Technological forcasting.

(6) **Aggregate Scheduling :** Cost factors, responses, cost of employment charges, Analytical approach to aggregate scheduling, approaches for smoothing employment. Analytical and not so analytical approaches.

(7) **Inventory control :** Inventory as a money stock, Functions of inventory system, Total inventory system, using models. Inventory related to flow rates, How much to make or buy at one time, Setting a reorder point. Relaxing more assumptions, Fixed order cycle. other invenory systems

(8) **Introduction to inspection and quality control.**

(B) Entrepreneurship Development :

(1) **Promotion of S. S. I. :** Entrepreneurship and dynamic development science like management, importance of entrepreneurship development, Development of small scale enterprise (Entrepreneur qualification, qualities, functions and responsibilities). Net work of various agencies to help on entreprenurs at state and national level, industrial protection, the importance of small scale industry (SSI) in the national context - comparision with SSI with medium / large scale sector. Industrial policy, resolution of govt. of India of 1965 and 1977, list of products reserved for exploitation of SSI.

(2) **Infrastructure :** Its understanding, its importance, working of industrial township, industrial estate, facillity for power and water etc.

(3) **Credit facillities and financial planning :** Knowledge of credit facillities, deposits, shares, debentures with their merits and demerits, industrial finance corporation, their help to engg. entrepreneurs, financial planning of project calculation of total capacity required, details of running capital and turnover, preparing the project, how to manage small scale industry.

(4) **Present status of SSI :** Present status of SSI in the country, regional characteristics, production employment generation, quality of products, scope of future, trends abroad-SSI in Asia, Middle east, African, Latin and American countries, parallel Indian context.

(5) **Legal Awareness :** Company registration and factory laws, municipal acts, taxation laws, labour relations and labour laws, legal formalities.

(6) **Psychic Importance :** Psychic impediments will factor, unawareness of one's own and initial incompetence, modern industrial pioneers, causes of failure etc.

Books :

(1) " Modern Production Management" : E. S. Buffa Wiley, East Press 1971

(2) "Production/Operation Management" : E. I. Levin & Others, Tata McGraw Hill 2974

(3) "Small Industries Production Handbook" : K. K, Mohan Productivity service International Trades Bombay 1971.

Reference books :

(1) "Production Management" : H. N. Broom, D. B. Tarapurwala, 1971.

(2) "Promotion of Small and Medium Sized Firms", Development Centre Organization and Economic Corporation,. 1967.

(3) "Small Industries in Service", Ram K. Vepa, Vikas Publications Delhi, 1971

604. PROCESS EQUIPMENT DESIGN-I

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
3	4	100	4	50	50	25	225

Criteria & factors for design, need for design. Basic considerations in Equipment Design. Materials & Protective coating

Process design of following Chemical Engg. Equipments Like

1. Heat Exchangers & Condensers.
2. Distillation Column : Tray Towers, Packed Towers etc.
3. Absorption & Desorption Column.
4. Dryers : Tray, Rotary, Spray etc.
5. Cooling Towers
6. Crystallizers
7. Recent developments.

Practical and Term-work :

The detail design of above equipments should be given to students. The report of the same be submitted by students in form of journal, drawing sheets etc.

Books :

1. 'Plant Design & Economics for Chemical Engineers'- Peters & Timmer Hans
2. 'Mass Transfer Operations' - Robert E. Treybal.
3. 'Process Equipment Design for Petrochemical Plants' - R E Ludwig
4. 'Chemical Engineering' - Vol. 6 - Richardson & Coulson

605 INSTUMENTATION AND PROCESS CONTROL

Teaching Scheme		Examination Scheme					
Th	Tu pr.	Theo. marks	hr	Sess marks	Pr Oral marks	Term work	Total marks
4	4	100	3	50	50	25	225

Process Control :

1. **Introduction :** Steady state system, Process control, Feedback control, transient response, proportional control Integral control, block diagram, parts of control system
2. **Laplace transforms :** Definition, transforms of simple functions, ramp functions, sine functions, solutions of differential equations Inversion of transform function by partial fractions, qualitative nature of solutions Final value and initial value of theorems, translation of transforms, transforms of unit impulse functions, transforms of integral.
3. **Response of First Order Systems :** Mercury thermometer, transient response of step functions, sinusoidal input, impulse functions.
4. **Physical examples of first order systems :** Liquid level, mixing process, RC circuit, linearization.
5. **Response of first order system in series :** Non interacting system of liquid level, generalization of several non interacting systems in series, interacting systems
6. **Second order systems :** Development of transfer functions, damped vibrator, liquid [illegible], thermometer in thermopocket, step response of e<1, e=1, e>1, overshoot, decay ratio, rise time, response time, period of oscillation, natural period of oscillation, impulse [illegible] impulse response for e<1,e>1,e=1, sinusoidal response, transportation lag.
7. **The control systems :** Block diagram, negative and positive feedback, servo problem v/s [illegible] development of block diagrams, process measuring element, controller, [illegible]
8. **Controller and final control elements :** Control valve, proportional controlling, on off control, proportional integral(PI) control, proportional derivative (PD) control, proportional integral derivative (PID) control, motivation for addition of integral and derivative modes, block diagram [illegible] control system
9. **Closed loop transfer function :** Standard block diagram symbols, overall transfer function for single loop system, overall transfer function for change in load, overall transfer function for multiloop control system
10. **Transient response of simple control systems :** Propotional control for Set point change (Servo Problem), Propotional control for load change (Regulator Problem),Propotional integral control for load change, Propotional Integral control for set point change, Propotional control for system with measurement lag
11. **Stabilty :** Concept of stability, defination of stability (linear system), stability criterion, characteristic equation, Routh test for stability, Routh array theorems of rough test, Nyquist stability criterion
12. **Frequency response analysis :** Fortunate circumstances, transportation lag, Bode diagrams, first order system, first order system in series, graphical rules for Bode diagrams.
13. **Control system design by frequency response :** Tank temperature control systems, Bode stability criterion, Ziegler Nicholas controller settings, transient response phase margin magnitude ratio, phase shift open loop Bode diagrams of various controllers
14. **Controller Mechanism :** Actual v/s Ideal controller, electrical controller mechanism PI, PD & PID controllers, phase angle plots, integral controllers, pneumatic controller mechanism baffle nozzle, propotional controller merhanism, analysis, PI control, PD control, PID control, relay bellows, interaction in the three modes of controllers, hydraulic controller mechanism, hydraulic integral controller, hydraulic power supply, hydraulic propotional integral control
15. **Setting of different modes of controllers :** Frequency response Bode plots, controllers tuning based on Bode plots, Nyquist diagram, Root locus method, Reaction curve method, Search techniques
16. **Final control element :** Pneumatic actuators, electro pneumatic actuators, hydraulic actuators, flow through control valves, control valve characteristics, linear type, non linear of decreasing sensitivity and equal percentage type, control valve.

17. **Control of complex processes :** Control of distillation tower, interacting control system, choice of different modes of control, cascade control, feed forward control, combined feed forward feedback system, dead time, compensation, control of heat exchanger

Process Measurement :

1. **Introduction :** Elements of instruments, parts of instruments, static and dynamic characteristics.
2. **Temperature Measurement :** Scales, Expansion thermometers like constant volume gas, mercury in glass, bimetallic, filled system thermometer like pressure spring thermometer, static accuracy of thermometer,response of thermometer, dip effect in thermometer errors in thermometer of liquid and gas filled type like cross ambient effect, head effect, methods of compensation

   Thermo electric temp. measurement : Thermo couples, laws of thermo electricity, material of construction of lead wires, thermal well response of thermocouple, thermocouple circuit for various [illegible] situations, null potentiometer circuit

   Resistance thermometer: materials for bulb circuits, null bridge etc., deflection resistance thermometer, thermometers etc

   Pyrometers : laws of radiation, radiation energy distribution, radiation receiving element, [illegible] photo electric pyrometers, optical pyrometers, errors in optical pyrometers.
3. **Pressure Measurement :** Liquid column manometer, enlarged leg manometer, well manometer, inclined tube manometer, ring manometer, tilting U tube manometer, bourdon gauge, bellows, diaphragm pressure elements, bell [illegible] pressure gauge, bellows differential pressure gauge, pneumatic balance pressure differential elements, electric pressure gauge slack and corrugated diaphragm liquid seals, volumetric seals, [illegible] syphon, purge system

   Vacuum Measurement : Ionization gauge, knudsen gauge, McLeod gauge, [illegible] vacuum gauge, thermocouple vacuum gauge, installation of pressure measuring instruments
4. **Liquid level measurement :** direct measurement, float and tape float [illegible] hydraulic [illegible] bubbler system, diaphragm system, air trap system, [illegible] pressure [illegible] float and spring, pneumatic balance, displacement [illegible] gauge [illegible] nuclear radiation [illegible] system photo [illegible] measurement of level of solid [illegible]
5. [illegible] flow meter, orifice plate, [illegible] heat flow meter, flow nozzle, venturi tube, pitot tube, [illegible] flow [illegible] meter, [illegible] orifice plate [illegible] approach [illegible] for [illegible] piston meter, [illegible] meter, gas flow meter, weirs and flumes [illegible]
6. Density measurement : liquid level method, displacement meters, [illegible]
7. Viscosity measurement : [illegible]
8. [illegible] method, wet bulb [illegible] electrolytic water analyzer [illegible] method, [illegible]
9. [illegible] electrode for pH measurement, calomel reference electrode [illegible]
10. [illegible] conductivity cell [illegible] magnetic [illegible] absorption [illegible]

[illegible]

(1) "Process [illegible] & [illegible]" Coughanowr and Koppel, Mc Graw Hill [illegible]

(2) "Process Control", [illegible] Education [illegible] York

[illegible] Donald P Eckman, [illegible]

(1) [illegible] Donald P Eckman

(2) [illegible]

(3) [illegible] Process C [illegible]

Practical and term work for Instrumentation and Process control

Experiments based on the above topics for Study of response of first order system, second order system, Integral controller, PI controller, PD controller, PID controller, differential pressure cell.

Calibration of flow measuring, temperature measuring, pressure measuring instruments.

Experiments based on gas analysers like chromatograph, measurement of density, viscosity, humidity, PH etc.

Study of two position control, U tube manometer.

701. Chemical Reaction Engineering I

Teaching Scheme		*Examination Scheme*				
Th	*Tu/pr.*	*Theo. marks*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	4	100	50	50	25	225

1. **Kinetics of homogenous reactions :** Classification of reactions Definitions of reactions rate, variables affecting reaction rate concentration dependent term of rate equation for elementary, nonelementary, single and multiple reactions. Molecularity and order of reaction. Kinetic models for non elementary reactions. Testing kinetic models. Temperature dependant term of rate equations. arrhenius theory, collision theory. Temperature dependancy from thermodynamics, comparison of theories. Prediction of reaction rate by theories.

2. **Kinetics of electrode process :** Kinetics of hydrogen evolution hydogen over potential and current density, electrode material, effect of composition and nature on hydrogen over potential of effect of temperature and other factors. Mechanism kinetics of the oxygen evolution. General description of process and mechanism of anodic oxygen evolution.

   Kinetics of electrochemical reduction and oxidation. General redox reaction. Experimental data. effect of electrode material and electrode potential. Effect of solution composition, theory of electrochemical reduction and oxidation reactions. Rate determination electron addition step, rate determining addition of hydrogen atoms, rate determining addition of activated hydrogen atom.

3. **Kinetics of reactions in solutions :** Collision theory and reaction in solutions. Rate of chemical reactions in solutions. Very rapid, normal and slow reactions. Activated complex theory and reactions in solutions.

   [illegible] ionic strength of solution on rates. Reaction and between ions. Influence of pressure on reaction rate, effect of substitutes in organic molecules, hetrolytic and homolytic reactions, nucleophilic and electrophilic reactions electron transfer reactions and conjugated reactions.

   Kinetics of enzymes catalysis, enzymes. Kinetios of enzymes. Kinetics of photo chemical/ reaction quantum yield and classification of photochemical processes, overall and local rate of photochemical reactions. Temperature dependence of rate of photochemical reactions.

4. **Kinetics of chain and high molecular compound formation reactions :** General examples of chain reaction length of chain and branch; chain branching. Kinetics of unbranching reactions; Branching. change reaction kinetics of oxidation of hydrogen.

   Radical polymensation, copolymerisation ionic coordination polymerisation, polymerisation with ring opening of poly condensation.

5. **Interpretation of Batch reactor data :** Integral and differential methods of analysis of data for constant volume and variable volume cases, first order, second order autocatalytic reaction related reversible and irreversible reactions, searching a rate equation and mechanism to fit experimental data.

6. **Introduction to reactor design :** Mass and energy balances around a volume element. Single ideal reactors under steady state conditions. batch mixed flow & plug flow reactors, space time and space velocity Introduction to semibatch reactor.

7. **Reactor design for single reactions :** (With reference to first and second order reactions) the comparison of single reactors, Batch reactor mixed versus plug flow reactor, general graphical comparison.

   Multiple reactor system, plug flow reactors in series, mixed flow reactors in series, reactors of different types in series, recycle reactors and autocatalytic reactions.

8. **Reactor design for multiple reactions :** Reversible and irreversible reactions of various order . Series, parallel and complex reactions. Contacting patterns and product distribution.

Performance characteristics, kinetic study and design for mixed and plug flow reactor.

9. **Temperature and pressure effects :** (Single Reactions) Calculations of heats of reactions and equilibrium constants. General graphical design procedure Optimum temperature progression. Energy balance equations in adiabatic and non adibatic case Performance of mixed, plug flow and semibatch reactors.

10. **Temperature and pressure effects** (Multiple reactions) . Product distribution and temperature, temperature and vessel size for maximum production

11. **Industrial applications :** Nitration, sulfonation & sulfation, Hydrolysis, Alkylation Esterification, polymerization, oxidation, reaction, fermentation, chlorination, photo chlorination cracking, etc. Should be discussed with reference to types of reactors utilised in these unit processes

Text Books :

(1) "Chemical reaction Engineering", Octave Levenspiel wiley Eastern pvt Ltd

(2) "Chemical Kinetics and Catalysis", G. M. Panchencov and V. P. Lebedav, Mir Publishers, Moscow.

Reference Books

(1) "Chemical Engineering Kinetics" D.M. Smithy, McGraw-Hill

(2) "Reaction Kinetics for Chemical Engineers",S.N.Wales.McGraw-Hill

(3) "Chemical Reactor Theory", K.G.Denbigh and D.C.R.Turner, English Language Book Society and Cambridge University Press.

Practicals and Term Work for Chemical Reaction Engineering :

Experiments based on the kinetics of homogenous reactions, kinetics of electrode process, rate determining reactions etc.

702. Process Equipment Design II

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr*	*Theo marks*	*hr*	*Sess. marks*	*Pr. Oral marks*	*Term work*	*Total marks*
4	[illegible]	100	4	50	50	[illegible]	225

Mechanical Design of following equipment :

1 Pressure vessel design
2 Reactors
3 Storage vessel design
4 Distillation & Fractionation Equipments
5 Dryers
6 Evaporators & Crystalizers
7 Filters
8 [illegible] Pressure Vessels
9 Supports [illegible]
10 Agitat[illegible]
11 Pre[illegible]
12 [illegible] developments

[illegible] and Term work :

[illegible] actual design of [illegible] equipment [illegible] should be given to students

Sketches [illegible] accessories [illegible]

[illegible] ooks :

1 Process Equipment Design - [illegible]
2 Process Equipment Design - V[illegible] - L. E. Br[illegible] & D. [illegible] Young
3 [illegible]

703 [illegible]ective [illegible]

[illegible]

[illegible] elective Subject should be opted from the list given below.

1. Fert[illegible] Technology :

A. Introduction : Need of fertilizers, types of fertilizers (straight mixed compound) (N,P,K), Merits & demerits of fertilizers applications of fertilizers.

B. Nitrogenous Fertilizers Ammonia : Sources of Nitrogen and Hydrogen, Industrial Methods of obtaining Nitrogen, Hydrogen and Syngas, Synthesis of Ammonia, Study of various types of converters used for ammonia synthesis.

Urea : Its properties, Urea as fertilizers. Processes for manufacture of Urea. Its comparative study, merits and demerits.

Nitric Acid : Manufacture of Nitric acid by different processes.

Ammonium Nitrate - properties & manufacturing processes.

Sodium and Potassium Nitrate.

C. Phosphatic Fertilizers : Mining of Phosphate rock, handling & storage, phosphate rock processing.

Superphosphates (Normal & triple)

Phosphoric Acid - properties, application & manufacturing procress.

Phosphates : Calcium metaphosphates, diammonium phosphate, nhitrophosphate.

D. Potassic fertilizers : Mining & manufacture of Potash. Other potassic fertilizers like potassium sulfate, potassium trisulfate, potassium nitrate, potassium hydroxide.

E. Mixed Fertilizers : Manufacture & granulation of mixed fertilizers. Trace salts in fertilizers

F. [illegible] Industry in India and its comparison with world's fertilizer Industry.

2. Petro[illegible] Refining and Petrochemicals :

A. Types of Crudes

B. [illegible] of Oil stocks & Refinery Products.

C. [illegible] of Crude and Products

D. [illegible] of Petroleum Atmospheric Distillation and Vacuum Distillation, Various ways of [illegible] Distillation Schemes.

E. [illegible] Operations for Crude and Refinery Products.

F. [illegible] and Catalytic Processes Employed in Refineries.

G. [illegible] Types and Refineries in India

H. Manufacturing processes of : Chemicals from methane, C2 compounds, C3 compound, Aromatics, polymers etc. engineering problems associated with processes, Major uses of petrochemicals & recent developments in the processes.

3. Dyes & Intermediates :

Classification of Cyclic Intermediates according to Unit processes such as Nitration, Reduction, Amination by ammonolysis, Sulphonation, Helogination, Alkylation, Condensation [illegible] Chemical Conversions.

Classifications of Dyes according to its applications & Colour index, Chemistry of dyes, [illegible] processes of various Dyes such as Azo, Anthraquinone, Vat, Chrome black -blue, [illegible] etc.

Various equipments used for dye industries.

Testing methods & chemical analysis of some important dyes.

[illegible]

1. [illegible] chem process industries by G.E. Austin.
2. [illegible] outlines of chemical technology by G.Rao & M.sitting.
3. Dyes & their intermediates by E.N. Abrahatt.
4. Dyes & intermediates by S.Venkaraman.

4. Food & Oil Technology :

Food Technology : Chemestry of food constituents. Bio-Chemistry & Nutrition, Food Additives, Food preservatives & principle of preservation, food Microbiology, manufacturing of [illegible] Dairy products, Bakery products, Confectionary food juce concentrate, Synthetic Flavours etc. Analysis of foods, Processing of foods.

Oil Technology : Vegetable oils, Hydrocarbon Oils, properties & Testing of oils, Chemical Physical treatments, Manufacturing of Oils, Uses of Processes.

5. Modelling & Simulation :

Steady state process simulation, process optimization, using techniques such as method of classical calculus, mathematical programming etc., Dynamic modelling & Simulation of Chemical processes.

Practical and Term-work :

Experiments based on the above topics for the testing, identification, analysis and preparations etc. should be given to the students.

704. Chemical Engineering Economics & Project Engineering

Teaching Scheme — *Examination Scheme*

Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr. Oral marks	Term work	Total marks
3	-	100	3	50	-	-	150

1. **Introduction :** Basic considerations in chemical engineering plant design-project identification-preliminary techno-economic feasibility
2. **Process design aspects :** Selection of process-factors affecting process selection. Importance of Laboratory development pilot plant, scale up methods, safety factors, types of flow diagrams.
3. **Selection of process equipments :** Standard versus special equipment-material of construction for process equipments, selection criteria, specification sheets
4. **Process auxillaries :** Piping design, layout, supports for piping insulations. Pipe fittings, types of valves, selection of valves, process control and instrumentation control system design
5. **Process utilities :** Process water, boiler feed water, water treatment, waste treatment and disposal, disposal, steam, oil heating system chilling plant compressed air and vacuum.
6. **Plant location and layout :** Factors affecting plant location, factors in planning layouts, principles of plant layout, use of scale models
7. **Cost estimation :** Factors involved in project cost estimation - Total capital investment, Fixed capital and working capital, types and methods for estimation of total capital investment, Estimation of equipment cost production, factors
8. **Estimation of total products cost :** Factors involved in project cost of production, factors affecting investment and production costs.
9. **Depreciation :** Types and methods of determining depreciation, evaluation of depreciation methods.
10. **Profitability, alternative investments and replacement :** Methods for profitability evaluation, Practical factors in alternative investment and replacement studies
11. **Economic considerations in process and equipment** design : Inventory control scheduling a project using CPM/PERT methods, project management
12. **Optimum design :** General production rates in plant operation optimum conditions optimum production rates in plant operation [illegible] conditions in cyclic operation

Books

1. Plant design and Economics for Chemical [illegible] by M.S. Peters and Timmerhaus Mc Graw Hill (japan) 2nd Ed. [illegible]
2. Chemical Engineering Plant Design [illegible] Vilbrandt [illegible] E. Dryden McGraw Hill (New York) Foruth edition 1959

70[illegible] Environmental Protection & Safety Management

Teaching Scheme — *Examination Scheme*

Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr. Oral marks	Term Work	Total marks
3	-	100	[illegible]	50		-	150

1. Introduction to ecology, Pollution and its effect on environment
2. Need for environment con[illegible] Pollution of [illegible] pollution in Chemical industry
3. Safety [illegible] Hazards [illegible] for chemical [illegible]
4. Prevention control and remedy of hazards etc.
5. C[illegible] problems and topics [illegible] environment in [illegible] industry

Environmental protection :

Concept of environment and ecology, various natural cycles in environment and ecology, effect of human activities on environment and ecology.

Various types of environmental pollution in general and in chemical and allied industry in particular. sources and causes of environmental pollution, effect of pollution on environment, environmental impact assessment and EIS, methodologies for environmental pollution prevention including process technology upgradation, development, invention etc.), control, abatement and treatment and waste disposal.

Rules, regulations, laws etc regarding environmental protection, pollution prevention and control, waste disposal etc. Role of government, semi/quasi govt. and voluntary organizations.

Current trends and topics.

Safety Management :

Current practices and topics in safety management, rules, regulations, laws etc for safety management in industry

1. **General Introduction** : Historical Background, Grown of Safety Science, Aims of Safety Science, Safety and the Organisation.
2. **Basic Concepts of Safety Science :** Hazard, Risk, Nature of the accident process, Use of Engineering Fundamentals in safety science.
3. **Techniques of Hazard Identification** : Hazasrd and Operatibility Studies (HAZOP), Safety Audits, Hazard Analysis.
4. **Fault and Event Tree Analysis for Risk Prediction.**
5. **Source Models** : Models of Accidental Release of Toxic/Flammable liquids and vapours, Models of flow of liquids and vapours through pipes.
6. **Dispersion Model** : Mathematical Models for prediction of Dispersion patterns to toxic/ flammable materials released into atmosphere, various types of "plume" and "puff" models of [illegible]
7. **[illegible] fires and explosion** : Calculation of Blast damage due to over-pressure, prevention [illegible] and explosions.
8. **Introductory ideas on toxicology/industrial hygiene.**
9. [illegible] Major Chemical Hazards : Emergency Control and disaster planning.

Selected Reference

1. [illegible] "Loss Prevention in Process Industries"
2. David A Colling, "Industrial Safety : Management and Technology".
3. W Hammer "Occupational Safety Management and Engineering".
4. V C Marshall "Major Chemical Hazards".
5. B S Dhillon "Reliability Engineering in System Design and Operation".
6. D A Crowl and J F Iouvar, "Chemical Process Safety" Fundamentals with Applications.
7. Safety & Accident prevention Methods Vol I & II. By National Safety Council U.S.A.

706. Seminar

Teaching Scheme		Examination Scheme					
Th.	Tu/pr	Theo marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
	3	-	-	-	25	25	50

Under the above subject each student will be assigned the topic related to Chemical engineering & allied field. The student will make an upto date literature & information survey with reference to the topic assigned to him under the supervision of teaching staff members and will submit requisite no. of copies. He will present the material / literature in the form of a paper / report by giving a talk.

707. Inplant Training

Teaching Scheme		Examination Scheme					
Th.	Tu/pr	Theo marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
		-	-	-	25	25	50

Training of individual student in any chemical industry.

The duration of the inplant training will be of the order of 6 to 8 weeks. The student will be required to submit a report of the training to the head of department.

801. Chemical Reaction Engg. - II

Teaching Scheme		Examination Scheme					
Th.	Tu/pr	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	3	100	3	50	50	25	225

1. **Non Ideal Flow** Residence time distribution, The E.F. and C. Curves. Their inter relationship, ways of using age distribution function, Models for nonideal flow, Dispersion model, Chemical Reaction and dispersion Intensity of fluid mixing. Tanks in series model conversion, Multiparameter model, Deviation from plug flow, Models for real stirred tanks.
2. **Mixing of Fluids** Self mixing of single fluid, degree of segregation, Early and late mixing, models for partial segregation. Mixing of two miscible fluids, Product distribution in multiple reactions
3. **Kinetics and Design for uncatalyzed Hetrogeneous system** : Rate equation for hetrogeneous reactions, Combining linear rate expressions. Combining non linear rate equations. contacting patterns for two phase systems.
4. **Fluid Fluid Reactions :** Rate equation, Kinetic regimes for mass transfer and reaction, Rate equations for instantaneous reactions. Fast and intermediate ratre equatrions. Rate equation for slow reaction rate equation for infinitely slow reaction, film conversion parameter M Towers for fast and slow reactions, mixer settlers. Semibatch contacting patterns. Reactive distillation and extractive reactions
5. **Fluid particle Reactions** : Selection of a model. Unreacted core models for unchanging size spherical particles. Spherical particles of changing size. Diffusion through gas film and through ash layer controlling chemical reaction controlling. Shrinking spherical particles

   Plug and mixed flow of unchanging size solids under uniform gas composition, particles of single size and mixture of particles of various sizes. Fluid and fixed beds with solids entrainment, instantaneous reactions
6. **Catalysts** : Physical properties of catalyst, surface area, void volume, solid density pore volume distribution, Classification and preparation of catalyst, catalyst promoter. Catalyst inhibitors, Catalyst poisons, Nature and Mechanism of Catalytic reaction, Physical and chemical absorption
7. **Porous Catalyst :** Interpellet heat and mass transfer. Mass transfer with chemical reaction Effect of internal resistances of selectivity and poisoning.
8. **Deactivating Catalyst** Mechanism and rate equation for catalyst deactivation. Batch solids, rate for independent deactivation, Parallel series and side by side deactivation

   Flowing solids, Experimental reactors, mechanism to decay from experiment design and performance with a batch of decaying [illegible] Reactor with fluidized flowing catalyst Reactor and regenerator [illegible]
9. **Solid catalysed reactions** Rates of chemisorption. Adsorption isotherms and rates of adsorption and desorption. Adsorption desorption rate controlling surface reaction rate controlling. Quantitative interpretation of kinetic data. Experimental methods of finding rates. Differential, integral mixed batch and recycle reactors. Determining reactor size from rate equations. Product distribution in multiple reactions. Staged adiabatic packed reactors with intercooling. Staged mixed reactors, bubbling bed model
10. **Fixed bed Reactors** Global reaction rates. Mass energy balance equation for fluid flowing through bed of catalyst. Isothermal and adiabatic reactors, Heat transfer through reactor wall, Wall Film coefficient, Effective thermal conductivity. One and two dimensional model Calculations of external concentration difference and temperature difference with [illegible] and finite diffusion resistances. Effect of internal resistance on selectivity
11. **Slurry** [illegible] Effect of external transport resistance on global rate of reaction. [illegible] transfer [illegible] gas bubble [illegible] liquid Mass transfer [illegible] particle, Effect of mass transfer on [illegible] rates. [illegible] slurry reactors.

12. **Fluid bed Reactors** : Heat transfer and mixing in fluidized bed heat transfer to wall, Conversion in plug flow with axial dispersion, model, bubbling bed model, Duel reactors and trickle bed reactors

13. **Industrial application** Examples illustrations based on cracking of hydrocarbons, alkylation, nitration, ammination, sulfonation, sulfation, halogenation, hydrogenation, esterification, hydrolysis, oxidations, and polymerizations with special reference to reactors utilized in the above unit processes

Books Same as for Chemical Reaction Engineering I

Term Work and Practicals :

Experiments based on kinetics of heterogenous reactions, fluid reactions in towers, mixers, settlers etc

802. Transport Phenomena

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr.*	*Theo marks*	*hr*	*Sess marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	3	100	3	50	50	50	250

1. **Transport by molecular motion** : Review of momentum energy and mass transport by molecular motion

2. **Transport in Laminar on dimensional flow :**

(i) Momentum transport Shell momentum balances, velocity profiles in cases like adjacent flow of two immiscible liquids.

(ii) Energy transport Shell energy balances, Temperature profiles, Heat conduction with an electrical heat source, with viscous and chemical heat sources

(iii) Mass transport Concentration distribution in solid and in laminar flow, Shell mass balances Diffusion with hetrogenous chemical reaction, Diffusion in to falling liquid film

3. **Transport in arbitrary continum :**

(i) Momentum transport Equation of change for isothermal system, Equation of ... in rectangular, cylindrical and spherical coordinates

(ii) Energy transport ... equation of energy, equation of motion for forced and free convection in non isothermal flow.

(iii) Mass transport Equation of continuity for binary mixtures. Equation of change for multicomponent systems Mass flux in terms of transport properties Use of equation of change.

4. **Transport with two independent variables :**

(i) Momentum transport Unsteady viscous flow. Two dimensional viscous flow, Boundary layer momentum transport

(ii) Energy Transport Heat conduction in viscous flow, Boundary layer energy transport

(iii) Mass transport Unsteady diffusion. Diffusion in viscous flow. Two dimensional diffusion in solids, Boundary layer theory

5. **Transport in turbulent flow :**

(i) Momentum transport Time smoothing of equation of change for in compressible fluid and review of Empirical law of velocity distribution.

(ii) Energy transport Temperature fluctuations and time smoothing of temperature and energy equation Semi-emperical equations for turbulent energy flux Temperature profiles in circular tubes

(iii) Mass transport Time smoothing of equation of change turbulent concentration profiles

6. **Transport between two phases :**

(i) Momentum transport Friction factors for flow in tubes, flow rate and pressure drop relations, friction factors for packed columns.

(ii) Energy transport Non isothermal system, heat transfer coefficients, dimensionless correlations for forced and free convection in tubes and around submerged objects. Heat transfer coefficient for forced convection through packed beds.

(iii) Mass transport Mass transfer coefficients, correlations for binary systems in one phase and at low mass transfer rates. Definition and correlation for binary mass transfer coefficient in two phases at low mass transfer rates. Trasnfer coefficients for high mass transfer rates, Boundary layer theory.

7. **Transport in large flow systems :**

Macroscopic mass balance momentum balance and mechanical energy balance Estimation of friction losses. Macroscopic energy balance in non isothermal systems, Use of balances to solve steady state and unsteady state problems

Text Books

1 Transport Phenomena by R H Bird, W.E Stewart
2 Momentum transfer operations by S.K Gupta, Tata McGrawHill.

803. Elective-II

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr*	*Theo marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4		100	3	50	-	-	150

Note One Elective Subject should be opted from the list given below

1. **Unit Processes** : Various Unit processes in detail such as Nitration, Halogenation, Sulfonation, Oxidation, Alkylation, Hydrolysis, Amination, Ammation ...

Book Unit Processes in Organic Synthesis by P H Groggins

2. **Energy Technology** Potential for Renuable Energy sources, Energy conservation, Solar energy, Thermal & Photo electrical, Ocean Thermal energy sources, Geothermal energy utilisation, Wind energy, Bio-gas principles, reactors, Hydrogen sources of ... solar & chemical production of hydrogen, Metal hydride, Mocrohydel systems ... Heat pump applications in process engineering

Book 1 Non Conventional Energy Sources by G.D Rai

3. **Bio-chemical Engineering** Scope & possibilities, Characteristics & ... of biological matters, Kinetics of microbial growth, balance equation for batch & continuous ... Kinetics of enzyme catalysed reactions, Analysis of mixed microbial population ... & analysis of biological reactors productions isolations & ... transport ... in biological system, different improvement techniques ...

Books

1 Bio-chemical engineering by S. Alba, A.E Humphery, N.F Mills, 2nd Edition
2 Bio-chemical Engineering Fundamentals by J.E. Bailey, D.F. Ollis 2nd Edition 1986
3 Bio ... reactor, by B. Atkinsons (1974)

4. **Cryogenic Engineering** : ... applications areas of cryogenic, ... temperatures & energy/energy considerations Gas liquification ... liquifiers & cryogenic refrigerators, cryogenic ... thermo-physical properties at cryogenic temperature ... cryogenic separations, storage & transportation ... & vaccum technology, measurement techniques ... functions & their behaviour at cryogenic temperature

Books

1 Cryogenic systems by R. Barron, 2nd edition 1975
2 Cryogenic fundamentals by G. G. Haseldin (1971)
3 ... in Cryogenic Engineering by K. D Timmerhaus

5. **Advance Separation Techniques** : The new Mass Transfer ... (... Ion exchange, Chromatography), ... Electrodialysis ... ultrafiltration, pervaporation, Osmosis). Thermal ... fractional crystallisation etc

804. CAD & Process Optimization

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	3	100	3	50	50	25	225

1. Use of computer for Design Problems, Design of Chemical Process equipments and plants using computers with the help of various languages and packages.
2. Autocad
3. Optimisation of Chemical Processes :
   (a) Problem Formulation : The nature and organisation of optimization problems, Fittings, Models to Data, Formulation of Objective functions etc.
   (b) Optimization Theory and Methods :
   Basic concepts of optimisation, optimisation of unconstrained functions; one dimensional search, unconstrained multi variable optimisation, linear programming and applications, non linear programming with constraints, optimisation of stacked and discrete processes.
   (c) Application of optimisation:
   Heat transfer and energy conservation, separation processes, fluid flow systems, chemical reactor design and operation etc.
4. Simulation for various Chemical Engg. Operations such as Distillation, Absorption, Mixing, Evaporation, etc.

Practical & Term-work

Preparation of Computer Programs based on the above mentioned topics & Simulation of various Chemical Engg. Operations.

Text Books

1. Optimisation of chemical processes by T. F. Edgar and D. M. Himmelblau, McGraw Hill Chemical Engg. Series.

Reference Books

1. Operation Research by D.K. Gupta & D. S. Hira.
2. Numerical Methods in Science & Engineering-by Dr. B. S. Grewal, Khanna Publishers, Delhi.

805. Project

Teaching Scheme		Examination Scheme					
Th.	Tu/pr	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
-	6	-	-	-	100	50	150

Each student is required to submit project report on the designing of a chemical plant. The report will consist of important chapters such as the following :

(i) Introduction.
(ii) Literature Survey.
(iii) Selection of process and porcess details with justification.
(iv) Thermodynamics and kinetics considerations.
(v) Physio-chemical data and properties.
(vi) Material balance with flow sheet.
(vii) Energy balance with flow sheet.
(viii) Process design of various equipments and optimum operting conditions.
(ix) Fabrication drawing of one of the major equipments with all relevant necessary details.
(x) Other important consideration such as instrumentation and process control, plant layout, safety precautions etc.
(xi) Cost estimation.
(xii) Conclusions.

પરિશિષ્ટ '૩૫'

કામકાજ ક્રમાંક ૨ (૩૮)

IT 105 Application Packages-I

Teaching Scheme		Examination Scheme					
Th	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
0	3	0	3	0	50	50	100

Microsoft Word : Overview of Microsoft Word, formatting text and documents, Headings, Footers and Footnotes, Tabs, Tables and Sorting, Working with Graphics. Templates, Wizards and sample documents, Tools-Spell Check, Mail Merge.

Microsoft Excel : Overview of Microsoft Excel, Worksheets, Formatting. Introduction of functions, Chart features, Excel's Macros.

Microsoft Power Point : Overview of Power Point, Creating and formatting presentations, Working with text, Working with Graphics.

Practicals & Term work :

Laboratory work should include minimum 30 assginment covering all packages

Reference Books :

* 'Manuals of Microsoft Office'.
* 'The Compact Guide to Microsoft Office Professional'- Ron Mansfield - BPB Publications.
* 'Microsoft Office Professional' - Instant Reference - BPB Publications.

IT 107 Programming Languages

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
2	2	100	3	50	50	50	250

1. *Introduction* : Introduction to computers, organisation of computers (block diagram), modes of operation, types of programming languages, basic strucure of C programs, programming style, execution of C program.
2. *Constants, variables and data types in C* : Character set, C tokens, keywords and identifiers, constants, variables, data types, declaration of variables, value assignment, symbolic constants.
3. *Operators and Expression* : Arithmetic, relational, logical, assignment, increment, decrement, conditional, bitwise and special operators. Arithmetic expression, priority and evaluation, type conversion.
4. *Data Input and Output* : Reading and writing a character, formatted input and output.
5. *Control Statements - Branching* : IF and IF ELSE statements, Nesting, ELSE IF ladder, switch statement ? operator, GO TO statement
   Looping : WHILE, DO and FOR statements and jumps in loops.
6. *Arrays* : One dimentional, two dimentional arrays and their initialisation, multidimentional array.
7. *Character strings* : Declaring and initialising, reading and writing strings, Arithmetic operations, concatenation, comparison and handling of strings.
8. *Functions* : C functions, necessity, categories, calling and nesting of functions, arguments with and without return values, recursion, functions with arrays, noninteger functions and their handling.
9. *Structures and Unions* : Definition, initialisation, assignment of values, comparision of structure variables, arrays, structures with in structures, structures and functions, unions, size of structures, bit fields.
10. *Pointers* : Introduction, pointers and arrays, pointers and strings, pointers and structures, pointers miscellany.
11. *File Management in C* : Defining, opening and closing a file, input, output and error handling, random access to files, command line argument

12 *Dynamic memory allocation and linked lists* : Dynamic memory allocation, linked lists, advantages and types, pointers revisited, basic list operations and application of linked lists.

13 *Pre processor* : Macro substitution, file inclusion, compiler control directives, additions.

14 *C programming guide lines* : Development of algorithms and flowcharts, design, coding common errors, testing, debugging, efficiency.

15 *Graphics* : General graphical statements and program segments to draw point, line, circle and geometrical figures and graphs, selection of colours and filling colour into the figure.

16 *Programs* . Complete programs on typical applications.

Practical and termwork should include minimum 35 assignments based on the above topics, giving due weightage to each topic.

Books :

- 'Programming in C'; E. Balagurusamy, TMH
- 'Understanding pointers in C'; Yashwant Kanetkar, BPB
- 'Programming with C', Bkyron S. Gottfried, Schaum series, TMH.

પરિશિષ્ટ '૩૬'

કામકાજ ક્રમાંક ૨ (૩૯)

REVISED TEACHING AND EXAMINATION SCHEME

(In force from Sept., 1997)

B.E. CIVIL (Construction Technology and Management)

Semester III

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
301	Advanced Surveying	4	2	100	3	50	25	25	200
302	Fluid Mechanics	4	2	100	3	50	25	25	200
303	Elements of Geotech. Eng.	5	2	100	3	50	25	25	200
304	Mathematics-II	4	-	100	3	50	-	-	150
305	Adv. Constru. Materials	3	-	100	3	50	-	-	150
306	Computer Application-I	-	4	-	-	-	50	50	100
		20	10	500	-	250	125	125	1000

Semester IV

Sub. No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr/Oral marks	Term work	Total marks
401	Structural Analysis-I	4	2	100	3	50	25	25	200
402	Building Construction	4	2	100	3	50	25	25	200
403	Railway and Bridge Engg.	4	-	100	3	50	-	-	150
404.	Architecture and Building Planning	2	2	100	4	50	25	25	200
405.	Concrete Technology	3	2	100	3	50	25	25	200
406.	Computer Applications-II	3	2	100	3	50	25	25	200
		20	10	600	-	300	125	125	1150

Semester V

Sub No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr/Oral marks	Term work	Total marks
501.	Structural Analysis-II	4	2	100	3	50	25	25	200
502.	Adv. Construction-I	4	2	100	3	50	25	25	200
503.	Highway and Traffic Engg.	4	2	100	3	50	25	25	200
504.	Environmental Engg.	4	-	100	3	50	-	-	150
505.	Foundation Engg.	4	2	100	3	50	25	25	200
506.	Field Visit-I	-	6	-	-	-	50	50	100
		20	14	500	-	250	150	150	1050

Semester VI

Sub No.	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
601.	Design of Structures	4	4	100	3	50	50	50	250
602.	Adv. Construction-II	4	-	100	3	50	-	-	150
603.	Harbour and Airport Engg.	4	2	100	3	50	-	-	150
604.	Public Health Engg.	4	2	100	3	50	25	25	200
605.	Quantity Surveying, Estimating & Valuation	4	2	100	4	50	25	25	200
606.	Field Visits-II	-	6	-	-	-	[illegible]	[illegible]	100
		20	14	500	-	250	[illegible]	[illegible]	[illegible]

Semester VII

Sub No.	Name of Subject	Teaching Scheme Th	Tu pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
701	Design of Reinforced and Prestressed Concrete Str	4	4	100	4	50	50	50	250
702	Cons Plant & Eqp.	4	-	100	3	50	-	-	150
703	Engg Contracts, Tendering and Specifications	4	-	100	3	50	-	-	150
704	Construction Manage -I	4	-	100	3	50	-	-	150
705	Project Management-I	4	-	100	3	50	-	-	150
706	Project-I	-	10	-	-	-	75	75	150
		20	14	500	-	250	125	125	1000

Semester VIII

Sub No	Name of Subject	Teaching Scheme Th.	Tu/pr.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
801	Design of Steel Mesonary and [illegible] structures	4	4	100	4	50	50	50	250
802	Mai[illegible] & [illegible]ation	2	2	100	-	50	25	25	200
803	Ir[illegible]n Engg	4	-	100	3	50	-	-	150
804	[illegible]n Manage -II	4	-	100	3	50	-	-	150
805	Proje[illegible]gement-II	4	-	100	3	50	-	-	150
80[illegible]	Proj[illegible]	-	10	-	-	-	75	75	150
		[illegible]8	16	500	-	250	150	150	1050

301 Advanced Surveying

Teaching Scheme Th	Tu pr	Examination Scheme Theo. marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	50	25	25	200

Theodolite Traversing : Theodolite - Precision, Measurements of Angles, Errors affecting angular measurements, Types of traverse, Orientation of traverse surveys, Theodolite traverse - Field work. Latitude, departure. Co-ordinate system of traverse, Adjustment of close traverse.

Plane Table Survey : Plane table accessories, Advantages & Disadvantages, Methods of plotting - Radiation, Intersection & Traversing.

Tacheometry : Tangential tacheometry. Stadia tacheometry, Use of tangential and stadia tacheometry. Horizontal staff tacheometry, self reducing tacheometers.

Advanced Levelling & Contouring : Automatic levels, Booking of level books and R.L. computations, correction for curvature & Refraction, various types of levelling, trigonometric levelling contour plotting using radial line & square grids, Precise levelling.

Computation of Areas & Volumes : Computation of area of regular & irregular boundary, Trapezoidal & Simpson's rule, Electronic planimeters, computation of volume for earthwork in cutting & filling, capacity of reservoirs.

Curve Settings : Basics of Curves, Elements & Geometry, Designation of Curves, Problems in Curve location, setting out of circular and transition curves, vertical curves.

Hydrographic Survey : Significance of hydrographic survey, Tide gauges, sounding, Locations, Locating stations using sextants.

Introduction to Photogrammetry & Aerial Surveys : Photogrammetry, definitions, Principles of elevated & aerial photographs, methods of photogrammetry, Interpretation of photographs, mirror Stereoscope, Measurement of distance on photographs, Parallax bars, Remote Sensing applications in construction technology.

Use of Survey in Construction Works : Setting out bridge elements, road alignment and [illegible]s, Dams etc. Use of surveying and levelling methods during construction of engineering works.

Term Work : Will consist of field works and drawings based on the syllabus.

Text Books :

Surveying and Levelling, Vol. I & II : Kanetkar and Kulkarni

Surveying and Levelling : B. C. Punmia

Surveying and Levelling : Duggal.

References :

Surveying and Levelling : S. C. Rangwala

Elements of Photogrammetry : Paul R. Wolf

Advanced Surveying : V. Natrajan

Advanced Surveying : Agor.

302. Fluid Mechanics

Teaching Scheme Th	Tu pr	Examination Scheme Theo. marks	hr	Sess. marks	Pr. Oral marks	Term work	Total marks
4	2	100	3	50	25	25	200

Properties of Fluids : Density Specific weight, Specific Volume, Specific Gravity, Viscosity, Surface tension, Capillary

Pressure and its Measurement : Pascals Law, Absolute Pressure, Gauge Pressure, Atmospheric Pressure, Vacuum Pressure, Manometer-various types

Hydrostatic Forces on Surfaces : Total pressure, centre of pressure, vertical, horizontal and inclined plane surfaces, concept of Buoyancy, metacentric height

Dynamics of Fluid Flow : Equation of motion, Euler's equation, Bernoulli's Equation, Venturimeter Orifice meter, Notches and Pitot tube, Relation equilibrium

Pipe Flow System : Minor and major losses, Darcy Wiesbach equation, Pipe network, [illegible] in series and parallel, compound pipe, Laminar flow, concept of boundary layer

Dimensional and Model Analysis : Primary and secondary [illegible], dimensional homogeneity, Buckinghams theorem, dimensionless numbers, introduction to model analysis

Flow in Open Channel : Stable unstable, uniform, non-uniform, laminar and turbulent flow, critical section, specific energy, most economical section, Hydraulic jump

Term Work :

Will consist of atleast eight experiments and associated tutorial problems based on the syllabus.

Text Book :

'Fluid mechanics and Hydraulic machinery' : Modi and Seth

References :

'Fluid mechanics and Hydraulic machinery' : R K Bansal

'Fluid mechanics and Hydraulic machinery' : Arora

'[illegible] problems in [illegible]' : Subramanium

'Open channel flow' : [illegible]anya

'Open channel flow' : [illegible] Raju

'Fluid Mechanics' : Streeter

303. Elements of Geotechnical Engineering

Teaching Scheme Th	Tu pr	Examination Scheme Theo marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
[illegible]	2	100	[illegible]	[illegible]	25	25	200

[illegible]oduction to Geology : The earth [illegible] planet, scope of geology, Geological studies for [illegible] Formation [illegible]

Structural Features of Rocks : [illegible], folds, joints, faults, unconformities, overlap [illegible] outcrop etc

S[illegible] of Rocks : classification [illegible] sedimentary [illegible] metamorphic rocks [illegible] composition, texture & structure [illegible] of rocks

Geological Investigations : Various methods of Geological investigations, mapping. Interpretation of reports, case studies.

Introduction to Soil Mechanics : Definition, soil as construction material, limitations of soil mechanics.

Soil Properties : Soil as three phase system, related properties. Index properties, Atterberg limits, classification of soils & field identification, soil structure and mineralogy, soil-water properties

Permeability : Permeability, Factors affecting permeability, measurement of permeability, coefficient of permeability of common soils . seepage and seepage force, Quick conditions.

Compaction & Consolidation : Definition, Compaction, methods, standard and modified compaction tests, determination of dry density & optimum moisture contents. factors affecting compaction. Consolidation. Compressibility of soils, settlement analysis, Terzagi's one dimensional consolidation theory, settlement characteristics of clay & its evaluation.

Shear Strength : Definitions, different shear tests, interpretation of results, shear strength parameters & theory. shear strength of cohesive & non-cohesive soils.

Term Work : Will consist of atleast eight experiments based on the syllabus.

Text Books :

Geotechnical Engineering : C. Venketramiah

Engineering & General geology : Prabin Singh

References :

Text Book of geology : P. K. Mukherjee

A text book of soil Mechanics : Samsher Prakash

Soil Mechanics : Lambe & Whitman

Engg. properties of soil : Shashi Gulati

Soil Engg. in theory & practice : Alam Singh

Soil Mechanics & Foundation Engineering : B. C. Punmia

Basic soil Mechanics : R. Whitlow

Fundamentals of soil Mechanics : D. M. Tayler

Soil mechanics for Engineers : Spangler.

304. Mathematics - II

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	-	100	3	50	-	-	150

Fourier Series : Periodic functions, Dirichlets conditions, Fourier series, Euler's formulae, Fourier expansion of periodic functions with period 2 Π, Fourier series of even and odd functions. Fourier series of periodic functions with arbitrary periods, Half range Fourier series.

Laplace Transforms : Motivation, Definition, Linearity property, L.T. of elementary functions. Shifting theorem, Inverse Laplace transforms, Laplace transforms of derivatives and integrals. Convolution theorem. Application of Laplace transforms in solving ordinary differntial equations. Laplace transforms of periodic, unit step and impluse function.

Ordinary differential equations : Linear defferential equation of higher order with constant coefficients, method of variation of parameters, higher order linear differential equation with variables coefficients (Cauchy's and Legendre forms), simultaneous linear differential equation, model for the real world problems and their solutions, in particular, modelling of electric circuits, Deflection of beams. Free oscillations, forced oscillations. Resonance, Solution of Bessel and Legendre equations by series method. Definition and properties like Recurrence relations, orthogonallity.

Partial Defferential equations : Formulation of partial defferential equations. Directly integrable equations, Models of Engg. problems leading to first order P.D.E.'s, Lagrange's equation. Solution of special type of first order P.D.E.'s, Homogenous linear equations with constant coefficients, Application of partial differential equations, Boundary value problems and method of separation of variables, Modelling of vibration of a stretched string-one dimensional wave equation.

Numerical Methods : Motivation, errors : truncation error, rounded off error, absolute error, relative error and percentage error, solution of algebraic and transcendental equations by Newton-Raphson, bisection, false position and iteration and extended iteration mehtods, Convergence of these methods.

Text Books :

'Higher Engineering Mathematic' : B. S Grewal

'Appllied Mathematics', Vol. I & II : Wartikar & Wartikar

'Engineering Mathematics' : Dhavan & Shrivastav.

305. Advanced Construction Materials

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess marks*	*Pr. Oral marks*	*Term work*	*Total marks*
3	0	100	3	50	-	-	150

Introduction : Introduction to basic building materials. Introduction to soil, Stone, Lime, Cement, Timber, Aggregate, Mortar, Brick with their uses

Bricks And Blocks : Substitution for brick.. Concrete block, Flyash bricks, Sand lime or calcium silicate bricks, Specially shaped bricks, Facing bricks, Heavy duty bricks, Perforated bricks, Hollow bricks, Sewer bricks, Acid resistant bricks, Refractory bricks

Metals : The use of metals in civil engineering, general types, Structural steel (Plain carbon steel, Notch ductile steels, Selection of structural steel, Corrosion protection of steel), Concrete reinforcement, High tensile steel, High tensile bolt steel, Railway steels, Steel forgings, Steel and Iron casting, Cast steels, Cast Irons, Bearing pads, Aluminum with casting alloys and applications, Copper, Zinc, Lead, Commercial forms of metals

Polymers : Polymers in civil engineering, Structural plastics, Pipes, PVC pipes tiles etc., Polymer membranes, Permeable membranes, Fabric Structures, Coatings, Adhesives , Polymer concrete. Other uses, Epoxy and Resins

Glass and Insulating Materials : Introduction, Types of glass, Suitability and use of glass, Glass fiber or glass wool, Thermal Insulation, Types of insulating materials with their suitability, Sound insulation, Types of acoustical materials with their suitability

Bituminous Materials : Introduction, Binder mixtures (cutback & emulsion, rubberized binders, binder mixtures for roads, [illegible]), Bitumen [illegible], Permittivity of bitumen, Bituminous road materials

Finishes : Cladding, Glazing, Paint, Varnishes, Distempering, White washing, Lamination, Finishing of surface with Concrete and mortar, False ceiling

Utilization of Waste : General, By-products use as Cement Replacement, Coal ash, Rise husk ash, Silica fume, By-Product use as Aggregates Replacement, Blast furnace slag, Fly ash, Bottom ash, Boiler slag, Reclaimed concrete, Anthracite coal refuse

Miscellaneous : Use of coir, Ferrocement, Fiber concret with steel fibers, glass fibers, asbestos fibers, synthetic fibres, Natural fibers, Sealants, Cost aspect and Environmental consideration in construction [illegible] construction material, Aggregates for Road & Airport runways, Ballasts for railways

Text Books

'Civil Engineering materials' : Neil Jackson & Ravindra K. Dhir

'Civil Engineering materials' : Technical Teachers Training Institute

'Engineering [illegible]' : S. C Rangwala

References

Journal of construction management' : NICMAR

'Civil engineering & construction review' : CE & CR

'Construction materials purchase'

'Materials for Civil & Highway Engineers' : Derucher Korfiatis Ezeldin

306. Computer Application - I

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess marks*	*Pr. Oral marks*	*Term work*	*Total marks*
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Introduction : Introduction to computer and its accessories viz. monitor, keyboard, CPU, printer, scanner, mouse, digitizer etc., use of DOS commands for operating files, copying, making and changing directories etc.

MS Excel : An overview of workbooks, Entering text, values, dates and times, selecting ranges, saving Workbook, working with multiple workbook. Efficient data display, calculations, printing, sorting data, list basics, filtering records, fancy formatting, plotting charts, customizing charts, creating and supporting tables, creating the estimate worksheet, completing the estimate, Civil Engineering Applications.

Autocad : Introduction to autoCAD, its advantages and limitations, Drawing commands viz. point, line, circle, arc, polyline etc. to draw elemental drawings. Utility commands viz. save, status, limits, units, files, menu. Edit and Inquiry commands viz. erase, copy, move mirror, change, break, extend. Display commands and Drawing aid viz. zoom, pan, view, redraw, regenerate, fill, array. Layer commands, colour commands, linetype, LTscale, style, fonts, block, wblock, insert Dimensioning commands - leader, text, dim, dim1 etc. Attributes and base link commands viz. attdef, attdisp, attedit Slide commands viz. mslide, slide and Customization of menu. 3D commands viz. vpoint, hide, elevation, 3D-view, 3D-poly, Civil Engineering Applications

Term Work :

Use of EXCEL in civil engineering applications for bill preparation, quantity calculations, costing etc

Plan, elevation and/or section of a typical Residential/Public/ Industrial building using AutoCad application.

Text Books

'Mastering Excel' : BPB Publication

'Illustrated AutoCad' : BPB Publication

References

'Mastering AutoCad' : George Omura

'Inside Autocad' : Racker & Rice.

401. Structural Analysis - I

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	50	25	25	200

Internal Forces : Computation of internal forces in statically determinate structures such as plane frames, gables, beams curved in plan and planar truss.

Arches : Analysis of the three hinged arches (segmental and parabolic shapes only)

Slope and Deflection of Beams : Differential equation of elastic curve, relation between moment, slope and deflection, double integration method, Macaulay's method, moment area method

Strain Energy : Resilience, strain energy in tension, shear, bending, torsion, proof-resilience, modulus of resilience, impact and sudden loads.

Direct and Bending Stress : Members subjected to eccentric loads, middle third rule, kernel of the section, structures such as dam, chimney, tall buildings, retaining walls etc. subjected to wind or hydraulic loads.

Columns and Struts : Standard cases of end conditions and corresponding effective length, buckling, radius of gyration, principle axes, Mohr's circle of inertia, Euler's and Rankine's formula, eccentrically loaded columns, columns with lateral loadings.

Influence Lines : Influence line diagram for support reactions, shear force, bending moment for statically determinate beams and axial forces in trusses, criterion for maximum effect due to point loads and udl.

Planar Structures : Types of statically determinate and indeterminate planar structures, static and kinematic indeterminacy, principle of superposition, Maxwell's reciprocal relation, stable/unstable structures.

Propped Cantilever : Analysis of propped cantilever beams by consistent deformation method, rigid and elastic supports, beams of varying moment of inertia.

Fixed Beams : Computation of fixed-end actions for point load, uniformly distributed load, varying load and couples, settlement and rotation of supports, beams of varying moment of inertia.

Term Work :

Will consist of atleast twenty problems based on the syllabus.

Text Books :

'Basic Structural Analysis' : C. S. Reddy

'Mechanics of Structures', Vol.-I : S. B. Junnarkar and H.J. Shah

'Mechanics of Structures', Vol.-II : S. B. Junnarkar

References :

'Intermediate Structural Analysis' : C .K. Wang

'Mechanics of Materials' : Timoshenko and Gere

'Mechanics of Materials' : E. P. Popov.

402. Building Construction

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	50	25	25	200

Setting out of Buildings : Various shape of Buildings, Setting out buildings, marking of Horizontal & Vertical controls.

Excavation & Backfilling : Methods of excavations - shallow & Deep, Manual & Mechanised, types & methods of supports for different types of soil, Backfilling.

Treatments : Anti-termite treatment, waterproofing & D.P.C.

Foundation Construction : Construction sequences of deep & shallow footings / foundation in buildings, footing, wall footing etc.

Masonary Constructions : Construction of masonry walls, load bearing & non load bearing, various types of masonry bonds, Masonry lintels, Arches, Roof etc. in bricks & stones.

Concrete Constructions : Common concrete elements, foundation, floors, column, beam & slabs. Method of construction, Do's & Don'ts.

Roof : Various types of roofs, flat & sloped construction, laying of tiles, construction in brick concrete, wood & tiles, mud.

Flooring : Flooring for various types of Building, skirting, preparation of floor bases, concrete, RCC, tile, IPS, Screed, vacuum wood flooring etc.

Openings : Doors, windows & Ventilators, types, their constructions & installations

Finishing : Type of finishing, Internal & External finishing, pointing, plastering, cladding, white washing, distempering, varnishing & painting, wall papers etc.

Stairs : Stairs - types & their suitability, construction of stairs.

Term Work : Will be based on above topics. Students will visit various construction site and prepare a report based on information collected.

Text Books :

'Building Construction' : Bindra & Arora

'Building Construction & Technology' Vol. I to IV : R. Chudley

'Building Construction' : S. C.Rangwala

'Building Construction' : B. C.Punmia

References :

'Building construction & Technology' Vol.I to IV : W. Mackay

'Building construction' Vol. I & II : George Mitchell

'National Building code' :

'Building Construction' : Sharma & Kaul

'Building Construction' : Arora & Gupta

'Building Construction' : Gurucharan Singh

403. Railway and Bridge Engineering

Teaching Scheme		Examination Scheme					
Th	Tu/pr.	Theo. marks	hr	Sess marks	Pr/Oral marks	Term work	Total marks
4	-	100	3	50	-	-	150

RAILWAY ENGINEERING

Railway Transportation And Its Development : Role of railways in transportation, Classification of modes, Characteristics of transportation modes. Land transportation, Comparison of railway and highway transportation. Advantages of railways. Political, social and economic advantages. Classification of Indian railways.

Rails And Railway Track : The permanent way. Requirements of an ideal permanent way, Capacity of a railway track. Gauges in railway track. Railway track cross-section. Coning of wheels and theory of coning. Functions of rails. Requirements of rails. Types of rail sections double headed, bull-headed, flat footed rail, merits and de-merits. Length of rails. Welding of rails. Buckling of rails. Damaged rails. Rail failures. Wear on rails & methods to reduce wear. Unigauge. Gauge conversion. High speed tracks.

Creep of Rails : Definition. Indications of creep. Theories of creep including wave theory, percussion theory, drag theory. Effects of creep. Measurement of creep. Remedies or preventions of creep. Pulling back the rails. Anti-creepers. Use of steel sleepers.

Sleepers, Rail Fixtures, Fastenings & Ballast : Functions of sleepers. Requirement & classification of sleepers. Timber sleepers. Spacing of sleepers & sleeper density. Purpose of [illegible] Fish plates including sections & failure requirements. Spikes and its [illegible] dog spike, screw spike, round spike standard and classic spike. Chairs for B.H. and [illegible] C.I. chains and slide chains. Functions & requirement of good ballast. Types of ballast. Renewal of ballast.

Geometric Design Of The Track : Necessity. Gradients and grade compensation including [illegible] momentum gradient, pusher or helper gradient, gradients in station yards, grade compensation on curves. Speed of the train. Radius or degree of the curve. Superelevation or [illegible] objects of providing superelevation [illegible] with gauge, speed and [illegible] of the curve, [illegible] of cant deficiency, negative superelevation, [illegible] effects of curvature, types [illegible] requirements of transition curves.

[illegible] Control Systems & Safety Of Railway : Objects of signaling. Classification of signaling-detonating hand, fixed, semaphore, Warner, shunting, coloured light. Automatic train control systems. Causes of accidents and their prevention. Crossings.

BRIDGE ENGINEERING

Introduction : Development, classification and importance, identification of bridges, Selection of bridge site. Alignment. Traffic requirement of highway bridge, waterway of a bridge. Maximum flood discharge.

Foundations And Substructures : Essential requirement of a good foundation. General principles of design, Sub-soil exploration. Types of foundations & cofferdams. Abutments, Piers, Wing walls. Materials for substructures.

Super Structures : Essential requirement of good super structures, type & general principles of design. Bridge architecture.

Loading on Bridges : Buoyancy pressure, Centrifugal forces. Dead load. Deformation stresses. Earth pressure. Erection stress. Impact load. Live load. Longitudinal forces. Seismic load. Temperature variation forces, water pressure. Wind load & design of bridge foundations.

Temporary Bridges : Materials used. Fastenings used. Types. Bridges with intermediate supports. Bridges without intermediate supports. Floating bridges. Bridge bearings. Economic span of bridge.

Maintenance of Bridges : General aspects for maintenance of bridges and bridge components.

Text Books :

Railway Engineering : Saxena & Arora

Bridge Engineering : S. P.Bindra

Railway Engineering : S. C.Rangwala

Bridge Engineering : S. C.Rangwala.

References :

Text book of Railway Engineering : P. K. Bhattacharjee & A. K. Basu

Railway Engineering : N.K.Vaswani

Essentials of Bridge Engineering : D.J.Victor

Bridge Engineering : Agarwal & Sodhi.

404. Architecture and Building Planning

Teaching Scheme		Examination Scheme					
Th	Tu/pr.	Theo. marks	hr	Sess marks	Pr/Oral marks	Term work	Total marks
2	2	100	4	50	25	25	200

Introduction : Architecture. History of architecture. Vedic architecture. Indian architecture, contemporary architecture.

Principles of Architecture : General elements, architectural proportions, composition and planning. Functional planning.

Planning of Buildings : Planning of buildings from different fields of human activities viz. habitation. Education, Health, Recreation, Industry and Transportation, Spatial and land use planning. Techniques of organising spaces of different kinds in relation to each other, modular planning, selection of appropriate materials and techniques of construction. Planning for earthquake - resistant and fire - resistant structures.

Building bye Laws : Objectives, importance of bye laws.F.S.I.,Principles [illegible] building bye laws, rules governing setback, lightplane, parking etc.

Elements of Perspective Drawing : Types of perspectives, birds eye view, method of drawing perspective.

Term Work : Working drawings i.e. Plan,Elevation and Section of residential and public building along with perspective view.

Text Books :

Elements of building planning : Shah & Kale

Elements of perspective drawing : Shah & Kale

Building drawing : Shah,Kale & Patki

References :

Planning and designing of buildings : Y. S. Sane

Planning and drawing of buildings : S. C Agrawal

National building code of India.

Civil Engineering Drawing & Design : Shahu

405. Concrete Technology

Teaching Scheme		Examination Scheme					
Th	Tu/pr.	Theo. marks	hr	Sess marks	Pr/Oral marks	Term work	Total marks
[illegible]	2	100	[illegible]	50	25	25	200

Introduction : Concrete as building material, advantages of concrete over conventional building materials, future of concrete.

[illegible] Role of different ingredients cement. Manufacture [illegible] types, suitability [illegible] of [illegible] cement [illegible] properties of cement. Hydration process [illegible] types [illegible] water. Role of water on [illegible] [illegible] chemicals [illegible] plasticizers, superplasticizers [illegible]

Fresh Concrete : [illegible] concrete & their measurement, quality control. Role of [illegible] concept of maturity.

[illegible] properties of hardened concrete and their measurement. Dimensional [illegible] Carbonation, sulphate attack, acid attack etc. [illegible] Destructive, Semi-destructive [illegible] testing [illegible]

[illegible] requirements, [illegible] statistical [illegible] of mix design. Mix [illegible] with & without admixtures

Special Techniques : Extreme weather concreting, mass concreting, pumped concrete, underwater, guniting & grouting.

Advances In Concrete : Architectural concrete, Prepacked concrete, light weight structural concrete, High Strength, High Performance Concrete, High density concrete, Polymer concrete, Ready mix concrete etc.

Term Work : Shall consist of atleast ten experiments based on the syllabus.

Text Books :

Properties of Concrete : A. M. Neville

Concrete Technology : M. L. Gambhir

References :

Concrete Technology : A. M. Neville

Concrete Vol. I, II, III : Orchard

Composition & Properties of concrete : Troxel Davis & Kelly

Concrete structures, Properties & materials : P. Kumar Mehta

Testing of concrete in structures : Bailey.

406. Computer Applications – II

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	2	100	3	50	25	25	200

Introduction : Introduction various programming languages.

Flowcharts and Algorithms : Definitions, rules for drawing flowcharts and writing algorithms, examples.

C Language : Fundamentals of C programs : Introduction,structure of C program, include statement, Concept of function, comments in C, operands in C, Data-types in C : Integer, Real, Enumerated etc. Branching and looping in C if, if-else, and switch statements, while, do-while and for loop,break and continue statement in loop, nesting of loops. Arrays and Functions in C Declaration of arrays, initialization of arrays, single and multidimentional arrays, arrays of characters, global and local variables, dividing a complex task into small modules, functions that make arguments, standard functions in header files. Structure, union and pointers in C : Declaration of structures, accessing structure members, arrays as structure member, structure initialization, array of structures, structure as function arguments, union, typed of declaration, array, address of array as function argument, Input and output using screen and files, introduction of pointers and memory addressing.

Term Work : At least ten applications Programs including for matrix operations, solution of quadratic equations, support reactions, shear force and bending moment diagrams, programmes for concrete mix designs, surveying, fluid mechanics and soil mechanics etc

Text Book :

Programming in C : E.Balaguruswami

References :

C-Programming : Brian W. Kernighan and Dennis M. Ritchie

Mastering Turbo C : Stan Kelly-Bootle.

501. Structural Analysis - II

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	50	25	25	200

Moment Distribution Method : Analysis of statically indeterminate beams and frames by moment distribution method, settlement and rotation of supports.

Slope Deflection Method : Analysis of Continuous beams by slope-deflection method.

Energy Principles : Castilango's theorems, application to statically determinate and indeterminate structures.Types of skelotal structures, Internal forces and deformations.

Matrix Methods : Types of skeletal structures, Internal forces and deformations. Introduction to flexibility method, application of stiffness method to analyse beams, trusses and plane frames.

Suspension Bridge : Unstiffened three hinged parabolic and catenary type- force, length and anchorage.

Approximate Methods : Introduction of substitute frame and approximate method of analysis.

Vibration : transverse, longitudinal and torsional vibration, single and two degree of freedom, natural frequencies, resonance, differential equation of vibration, amplitude and mode shapes.

Term Work : Will consist of at least 20 problems based on the syllabus

Text Book :

Matrix Analysis of framed structures : Gere and Weaver

Mechanics of Structures (Vol.-2) : S. B.Junnarkar

Basic Structural Analysis : C. S.Reddy

Mechanical Vibration : Grover

References :

Intermediate Structural Analysis : C.K. Wang

Indeterminate Structures : J.F. Kinney

Analysis of Structures (Vol -2) : Vazirani and Ratwani

Mechanics of Structures (Vol -2) : B.C Punamia

502. Advanced Construction - I

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr*	*Theo marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	50	25	25	200

Building Services : Various services in modern buildings viz. Plumbing, thermal control, electrification, vertical transportation, fire control, building automation, maintenance of services, safety in services, land scaping.

Deep Excavations : Shoring, strutting, underpinning, dewatering, mechanised excavation.

Deep Foundations : Construction of deep foundation, pile, raft foundation, caissons / well foundation, pneumatic caissons, vibrofloatation, bored and precast pile construction, diaphragm walls, heavy equipment foundations.

Fabrication And Erection of Steel Elements : Steel Structures, working details of fabrication, drawings, erection technique and safety code.

Large Span Construction : Construction of shell roof, folded plate roof, tee beam etc.

Tall Structures : Chimneys, building towers, cooling towers, elevated water reservoirs.

Term Work : Will be based on the topics students will visit various construction sites and prepare a report based on the information collected.

Text Books :

'Building Construction & Technology' Vol. I to IV : R. Chudly

'Building Construction : Barry

Building Construction : Gurucharan Singh

References :

Building construction & Technology Vol I to IV : W. Mackay

Building construction Vol. I & II : George Mitchell

Building Construction : Bindra & Arora

National Building code

Heavy Construction : Vazirani & Chandola

Foundation Design & Construction : Tom Limson

503. Highway and Traffic Engineering

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr*	*Theo marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	50	25	25	[illegible]

Introduction : Modes of transportation. Characteristics of road transport, Advantages of roads, Importance of roads in India, Requirements of an ideal road, Scope of highway engineering

Highway Planning And Alignment General, Objects of highway planning, Classification of highway, Formulae for road length, Highway alignment and factors effecting it, Highway re-alignment, works of realignment, general principles of re-alignment.

Geometric Design of Highways : Road structures, Width of pavement or carriage way, Traffic separation or medians, Kerbs, Road margins, Width of roadway, typical cross-sections of roads, Design speed, Stopping sight distance, Crossing and over-taking sight distance,Over-taking zones,Sight distance of intersections, Road gradient, Grade compensation on horizontal curves, Super elevation, Horizontal & vertical curves.

Pavement Design : Types of pavements, design consideration and parameters, design of flexible pavements, design of rigid pavements and joints, special pavements.

Types of Roads & Construction : Low cost roads; classification of roads, Bituminous roads; Advantages and disadvantages, Bituminous materials and-contribution of bituminous roads, Cement Concrete roads: Advantages & disadvantages, Comparison with bituminous roads, Construction and Other form.

Hill Roads Importance of hill roads, Classification of hill roads, Basic principles [illegible] planning of hill roads, Alignment of hill roads, Protective works for hill roads, Drainage in hill roads [illegible] Maintenance of hill roads.

[illegible] Drainage And Highway Maintenance : Sources of water entering the road structure, [illegible] due to improper highway drainage, Requirements of a good highway drainage [illegible], Surface and sub-surface drainage, Road construction in water logged [illegible] of failures of pavements, earth roads, gravel roads, W.B.M roads, bituminous roads and C.C. roads.

Traffic Engineering General, Objects of traffic engineering, Traffic surveys, Road [illegible], Parking, Traffic congestion, Traffic control, One way streets, Road junctions or [illegible] Types of intersections Traffic control devices, Peculiarities of traffic.

[illegible] Making Machines Excavation and grading equipment, Compacting equipment, Road rollers, Equipment for construction of bituminous roads and C.C. roads,pavers,hot mix plants bitumen boilers and sprayers.

Term Work : Will consist of at least eight experiments based on the syllabus.

Text Books

Highway and Traffic Engineering : Khanna & Justo
Highway Engineering : L. R. Kadiyali
Highway and Traffic Engineering : S. C.Rangwala

References :

Highway and Traffic Engineering : Richard Broker
Highway and Traffic Engineering : S. P.Bindra

504. Environmental Engineering

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	0	100	3	50	—	—	150

Impact of Man On Environment : The biosphere, The Hydrological cycle, The nutrients, Consequences of Population Growth, Energy problem, Pollution of Air,Water and Soil, Towards a solution.

Air Pollution Sources and Effects : Definition and Concentration,Classification and Properties of Air Pollutants, Emission sources, Major Emission from Global Sources, Behaviour and fate of [illegible] Pollutants, Photochemical smog, Effect of Air Pollutants on Health,Vegetation and Construction Material Damage, Air Pollution Laws and Standards, Metrological Aspects of Air Pollutant Dispersion: Tamperature Lapse,Rates and Stability, Plume Behaviour

Control Methods And Eqipments : Control Methods, Source Correction Method Cleaning of Gaseous Effluent, Particulate Emission Control concept of Gravitational Settling Chambers, Cyclone Saperator, Fabric Filter, Electrostatic Precipitator, Wet Scrubbers, Selection of Particulate Collector, Control of Gaseous Emission: Absorption by Liquids, Adsorption by Solids, Combustion.

Sources And Classification of Water Pollutants : Water Resources, origin of Wastewater, Types of Water Pollutants and Their Effect, Oxygen Demanding Wastes, Disease Causing Agents, Synthetic Organic Compounds, Plant Nutrients, Inorganic Chemicals and Mineral Substances, Sediments, Radioactive Substances, Thermal Discharge, Oil, Water Pollution Laws and Standards.

Wastewater Sampling And Analysis : Sampling, Methods of Analysis, Determination of physical, chemical and bacteriological parameters, Water Quality Standards.

Solid Waste Management : Sources and classification, Public Health, Aspect, Method of Collection, Disposal Method, Potential Method of Disposal.

Noise Pollution : Introduction, Effect of Noise, Community, Noise Sources and Criteria, Noise Control.

Radioactive Pollution And Control : Introduction, Sources, Discharge in Sea, Basic types of Radiations, Radioactive Decay, Personal Monitoring, Maximum permissible doses.

Text Book :

Environmental Pollution Control Engineering : C. S. Rao

References :

Environmental Engineering : G. N. Pandey
Environmental Engineering : Peavy
Environmental Sanitation : J.A.Salvato
Waste Water Engineering Treatment disposal and reuse : Metcalf & Eddy

505. Foundation Engineering

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr.*	*Theo. marks*	*hr*	*Sess marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	50	—	2[illegible]	200

Soil Investigation : Methods of exploration, exploratory borings, sampling - disturbed and undisturbed samples, penetration tests miscellaneous methods of exploration, record of field exploration and laboratory tests, and investigation reports, [illegible] in rocky strata, plate load test.

Types of Foundation : Shallow foundation [illegible] isolated footing, combined footing, strap footing, strip footing, raft foundation [illegible] foundation etc. Deep foundation : well foundation, pile foundation [illegible] foundations, factors affecting choice of foundation [illegible]

Bearing Capacity of Foundation : Bearing capacity of shallow and deep foundation based on shear and settlement criteria, bearing capacity in sands and clays [illegible] factors affecting soil bearing capacity, bearing capacity from penetration tests, bearing capacity of rock [illegible] strata, clay strata,

Settlement of Foundation : Causes of settlement, [illegible] on sand strata, clay strata, layered soil, factors affecting settlement, [illegible] settlement.

Design of Foundation : Design of shallow foundation [illegible] isolated, combined, raft foundation and deep foundation, pile and well foundation, foundation [illegible] lateral loads, design of cofferdam and caissons.

Earth Pressure And Retaining Structures : Active and passive earth pressure due to cohesive [illegible], noncohesive soil, [illegible] level and inclined backfill, Rankine's theory, Coulombs theory, pressure calculation for [illegible] walls, design of [illegible]

Stability of Slopes : Stability of slopes in cohesive [illegible] safety, method for analysis of stability of slopes.

Ground Improvement Techniques : [illegible] of soils, vibroflotation, sand piles [illegible]

Introduction of Soil Dynamics [illegible]

Introduction of Soil Structure Interaction

Term Work : Will consist of atleast eight experiments based on the syllabus.

Text Book :

A text book of soil mechanics : Samsher Prakash & Bharat Singh

Analysis and Design of Foundation : Samsher Prakash

References :

Foundation analysis and design : N. P. Kurian

Geotechnical Engineering : B. L. Kasmalkar

Basic soil mechanics : R. Whitlow

Modern geotechnical engineering : Alam Singh

Soil mechanics and foundation : B. C. Punmia

Design aids in soil mechanics and foundation engineering : Kaniraj

Soil engineering in theory and practice : Alam Singh

Foundation analysis and design : J. E. Bowles

Soil mechanics in Engg.practice : Terzaghi & Peck

Foundation Engineering : Peck,Hanson & Thornburn

Foundation Engineering : Leonard G. A.

506. Field Visits I

Teaching Scheme		Examination Scheme					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
-	6	-	-	-	50	50	100

Visit to civil engineering construction sites and study of the projects with respect to :

Drawings : Architectural, Planning, Structural detailing,Scheduling and Services.

Construction Activities : Materials, type, methods,controls,layout.

Tools,Plants & Equipments : Tools of masonry contruction,Different plants and equipments.

TERMWORK

Semester end presentation of the work in the form of Site Report & Jury/oral.

Semi. VI

601. DESIGN OF STRUCTURES

Teaching Scheme		Examination Scheme					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	4	100	4	50	50	50	250

Loads : Indian standard specifications for dead, live and wind load on buildings, wind loads on typical trusses.

Reinforcement : Different types of reinforcement and their properties.

Design Methods: Elastic method, Limit state method, ultimate load method, general principles and applicability.

Reinforced Concrete : Theory of simple bending as applied to R.C.C, elastic and limit state methods, rectangular beams with tension and/or compression reinforcement, simply supported slabs (one way and two way reinforced), one-way reinforced continuous slabs, Tee and ell beams, shear and bond, temperature and shrinkage reinforcement, axially loaded short and long columns, links and helical reinforcement, isolated footing, staircase, deflection of beams.

Steel Structures : Tension and Compression members, single and built-up sections, Choice of sections. Connections: Riveted, bolted and welded joints. their strength and efficiency, eccentric loading. welded joints subjected to bending and torsion.Simple roof truss, spacing, form, rise and camber, end connections, simple beams and purlins, rolled sections, deflections, simple connections of beam to beam, beam to column, column to base, connections. to transfer direct reaction with or without moment, stiffened and unstiffened connections, axially loaded columns, single and built-up sections, choice of sections, lacing and battening, splices;Foundations: Gusseted, grillage, slab base and base plate.

TERM WORK : It shall consist of twenty problems based on above syllabus.

TEXT BOOKS

Limit state theory and design of Reinforced Concrete — Shah & Karve

Design of Steel Structures — Arya and Ajmani

I.S. CODES

I.S. 456, I.S. 800, I.S. 875, SP 16, SP 34, SP 6(1)

REFERENCES

Design of Concrete Structures — A. K. Jain

Reinforced Concrete Design — S. N. Sinha

Design of Reinforced Concrete — Dayaratnam

Design of Steel Structures — Dayaratnam

Design of steel Structures — S.K. Duggal

602. ADVANCED CONSTRUCTION II

Teaching Scheme		Examination Scheme					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	-	100	3	50	-	-	150

Construction of Retaining Wall And Storage Structures : Retaining walls, water tanks, storage silos, chimneys.

Waterfront Constructions : Dams - gravity and earthen, regulators, canals,Underwater construction such as wharves, jetties, docks, piers,coffer dams etc.

Bridge Construction :Construction of foundations, substructures, superstructures.

Underground Construction : Tunneling, box pushing, various methods of tunneling, safety in construction below ground etc.

Construction In Earthquake Suspected Area :Requirements of building in earthquake prone areas construction methods.

Special Techniques : Grouting, guniting etc., ferrocement construction

Temporary Strucures : Requirements of temporary structures, elements, joints, shuttering and deshuttering, trestles, formwork for typical structures - arch,dam etc.

Modelar Coordination : Principles & techinques

Prefab & Precast Construction : Methodes of prefabrication & precasting, lifting of these elements & jointing, Safty in prefab precast constructions.

TEXT BOOKS

Building construction vol II III IV — R.Chudley

REFERENCES BOOKS :

Building construction & Technology vol I to IV — W. Mackay

Building construction Vol. I & II — George Mitchell

National Building [illegible]

Building Construction — Bindra & Arora

Building Construction — Barry

Construction of Structures and Management of Works — S.C.Rangwala

[illegible]. HARBOUR AND AIRPORT ENGINEERING

Teaching Scheme		Examination Scheme					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	-	100		50	-	-	150

AIRPORT ENGINEERING

Aircraft Char[illegible] Airport Planning : General [illegible] Military & civil Aircraft, [illegible] of [illegible] Relation [illegible] to landing facilities [illegible] new airport [illegible] Aircraft Characte[illegible] General Regional planning [illegible] for site selection, airport site selec[illegible]

Airport Obstructions: Zoning laws, Classification of obstructions, Imaginary surfaces, Approach zone, Turning zone.

Runway And Taxiway Design : Runway orientation, Basic runway length, Corrections for elevation, Temperature & gradient (Including Examples), Airport classification, Runway geometric design, Airport capacity, Runway configurations, Factors controlling taxiway layout, Geometric design standards, Exit taxiways, Separation clearance, Holding apron, Turnaround or bypass taxiway.

Terminal Area And Airport Layout: Terminal area, Building and building area, Airport erosion control, Blast fences, Typical airport layout, Hangers(Introduction).

Air Traffic Control: General, Need of aircraft control, control network, control aids.

Design of Heliports : Introduction to heliports, Helicopter characteristics, Planning of heliports.

HARBOUR ENGINEERING

Elements of Harbour . Water transportation, Harbours: artificial, natural and seminatural, Natural and artificial road streads, Accessibility, size and shape of harbours, Harbour depth, Features of a harbour, Defects in harbour. Ports: classification, design and requirements of a good port.

Break Waters : Break waters, Alignment, Forces acting, Classification of breakwaters, Breakwater height and failures, Comparison of mound type and wall type break waters.

Docks : General Open berths, Approaches to basins and docks, Depth of docks and basins, Location and internal arrangement, Design and construction of basin or dock walls, Dock entrances and caissons for dock entrances, Sizes of dock entrances, Wet docks, Dry docks.

Berthing Structures : Jetties, Piers, Wharves, Quays.

Navigational Aids : Light-house, bouys, anchors, moorings.

Transit Sheds & Warehouses : Planning,design and specific requirements.

TEXT BOOKS

Airport engineering	Khanna & Arora
Docks and Harbour Engineering	Oza & Oza
Harbour Engineering	S.C.Rangwala
[illegible]	Srinivasan
[illegible]	Horonjeff

REFERENCES

Airport Engineering	S.C.Rangwala
Airport Engineering	V.B.Priyani
Airport Engineering	Ashford & Wright
Harbour and Docks	R.Srinivasan
Notes on Harbour Engg.	Gopal Krishanan
Harbour Engineering	M.K.Rajan & Iyenger

604. PUBLIC HEALTH ENGINEERING

Teaching Scheme		Examination Scheme					
Th	Tu/pr.	Theo marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	50	25	25	200

Water : Mans environment: Importance of environmental sanitation Sources of water: Ground water and surface water.Availability of water: storage of reservoir.

Water Treatment : water qualities and standards,water classification and treatment system - flocculation,Coagulation, sedimentation, filteration, absorption, chemical oxidation/ disinfection Softening. Lime-soda sofening and Iron exchange sofening.Reactor Design - Mixing and flocculation rapid mix and flocculation, Sedimentation tank Filteration units such as Rapid sand filter Water plant waste management - sludge production and charactristics, minimization of sludge generation,sludge treatment.

Water requirement and waste volume : Design Period, Water requirement, factors affecting use of water residential use and its variation, fire demand, commercial, industrial and agricultural use Quantities of waste water generation, Residential wastewater flows and its variation.

Water Distribution Systems : Population forecasting, capacity of ESR required, various distribution systems, Design of water distribution systems. Water quality management Water pollutants and their sources, water quality management in rivers, water quality mangement in lakes.

Wastewater : Flow equations, pipe and open channel flow, velocity considerations, sewerage systems. Sanitary sewers, House and building connections, collecting and intercepting sewers, materials. System layouts, concept of Hydraulic Design, Sewer appurtenances, man-hole, drop manhole, building connections, junction chamber, inverted syphons, ventilating shaft.Waste water microbiology,charactristics of domestic waste water,on-site disposal systems,Municiple wastewater Treatment systems, Unit operations of pretreatment, primary treatment,unit processes of Secondary Treatment, Disinfection,Advanced wastewater treatment.

Sludge Treatment And Disposal : Sludge treatment,Effluent disposal, Receiving water and effluent standards, Effluent disposal by dilution stream pollution and oxygen sag, land disposal.Wastewater reuse: Municipal, Industrial, Agricultural and Recreational use.

TERMWORK : will consist of atleast eight experiments based on the syllabus.

TEXT BOOK

Introduction to Environmental Engineering	Mackenzie L. Davis & Daved A. Cornwell

REFERENCES

Water and wastewater engineering	Fair G M, Geyer J C and Okun D A
Water supply and pollution control	Clark J W, Viessman W and Hammer M
Wastewater treatment, disposal and reuse	George Tchobanoglous
Principles of water quality criteria	T.H.Y Tibbet
Water and Wastewater management	Steel and McGhee
Water supply and Sewerage	Mc Ghee
Water supply and Sewerage	E.W. Steel
Water supply and Sanitary engineering	S.C. Rangwala
A Text book of water supply	V.N. Gharpur
A Text book of Sanitary engineering	V.N. Gharpur
Municiple and Rural Sanitation	Victo M Ehlers and Steel
Water supply and Sewerage	E W Steel

605. QUANTITY SURVEYING, ESTIMATING AND VALUATION

Teaching Scheme		Examination Scheme					
Th.	Tu/pr.	Theo. marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
4	2	100	4	50	25	25	200

Rate Analysis : Meaning, purpose, factors affecting rate analysis. Requirements for rate analysis (Drawing, task work table, rates for material and labour), Methods of preparing rate analysis, schedules of rate.

Estimation : Meaning, methods of estimating, Detailed estimates, types of estimates, methods, unit rates, construction cost index, approximate method of estimating,block estimates

Finding out Quantity : Data required for working drawings. Methods of finding out quantities. Identify the items of work. Units of measurements and quantity. General rules for measurements & quantity survey, Spot items, prime cost, provisional quantities taking out quantities for typical Civil Engineering structures. Use of computer for finding out quantity & billing

Valuation : Meaning of cost,price,value purpose of valuation, different forms of value,Free hold and lease hold property,valuation for land and buildings.Factors & methods of valuation of properties,capitalised value and years purchase,valuation tables,depreciation- Meaning, causes of depreciation methods for estimating cost depreciation, Reproduction cost and replacement cost, Examples, obsolescence, sinking fund and its purpose, outgoing Definition, types, meaning of Gross income, net income and estimation of outgoing, rent Object, meaning and forms of rent, methods of ascertaining standard rent, easement Definition characteristics, creation of easements, Extinguishment of easements, effect on valuation land acquisition & acquisition acts, Transfer of property Act

TERM WORK :

Shall be based on above syllabus consisting of minimum five problems along with specification and rate analysis

TEXT BOOK :

Estimating & Costing in Civil Engineering	B.N.Dutta
'Valuation of Real properties'	S. C. Rangwala
Estimating and costing'	S. C. Rangwala

REFERENCES :

'Estimating and costing'	G. S. Birdi
'Estimating and costing'	Sharma and Chandola
'Quantity survey'.	B. S. Patil
'I.S 1200 : Method of Measurement of Building Works'	
'Theory and practice of real valuation'	R. H. Namavati
'Quantity Surveying'	P. L. Bhasil
'Civil Engineering Contracts & Specification Vol.2'	B. S. Patil
'Quantity Surveying & Costing'	Gurucharan Singh

606. FIELD VISITS II

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
-	6	-	-	-	50	50	100

Visit to civil engineering construction sites and study of the projects with respect to : **Study** of construction planning, Material management. Manpower allocation. Safety in **construction**, Quality control and workmanship, Taking measurement and billing.

TERMWORK :

Semester end presentation of the work in the form of Site Report & Jury/oral

Semi. VII

701. Design of Reinforced and Prestressed Concrete Structures

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	4	100	4	50	50	50	250

Loads : Loading standards as per I.S. codes IRC codes, distribution of loads, computation of wind load and earthquake loads, combination of loads, introduction to loading standards for bridges.

Reinforced Concrete Structures : Structural layout for buildings; Continuous beams, typical floor design including two way continuous slab, T-beam floor; Columns : Slender column with uniaxial and biaxial bending; Footing : combined and Raft; Structures : Canopy, cantilever shed, portal, building, flat slab, Spherical and conical domes, underground and elevated circular and / or rectangular water tanks, retaining wall; Structural detailing.

Prestressed Concrete Structures : Properties of high grade concerete and high strength steel pretensioning and post-tensioning, methods of prestressing, losses in prestress, analysis and design of pretensioned and post tensioned beam.

TERM WORK :

At least six designs based on above syllabus and detailing of any three.

TEXT BOOKS :

Limit state theory and design of Reinforced Concrete	Shah & Karve
Design of three-storeyed building	Shah and Karve
Reinforced Concrete Design	S. N. Sinha
Prestressed Concrete	Krishna Raju

I.S. CODES

IS: 456, IS:875, SP 34, SP 16, SP 26, IS:1343

REFERENCES :

Design of Reinforced Concrete	Dayaratnam
Design of Concrete Structures	A.K. Jain

Limit state Design of Reinforced Concrete	Verghese
Reinforced Cement Concrete	McGinley
Plain and Reinforced Concrete	J Krishna and O.P. Jain
Design of Prestressed Concrete Structures	T. Y. Lin
Limit state Design of Prestressed Structures	Y. Guyon
Working Details of Reinforced Structures	Sawhney
Working Details of Steel Structures	Sawhney

702. Construction Plants & Equipment

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	-	100	3	50	-	-	150

Tools, Plants & Equipment : Importance of tools, plants & equipment, classifications, selection.

Earth Handling Equipment : Theoretical background, Machine requirements, classifications. Scrapers, Power shovels, Clam shells, Drag lines, Push dozers, Ripers, Angle dozers, Bull dozers, etc.

Hauling Equipment : Tractors, Dumpers, trucks, wagons, Power requirements, classifications, attachments, Selection and operation.

Hoisting Equipment : Vertical hoists, motor cranes, tower cranes, working ranges, types, selection, lifting capacity, etc.

Pumping Equipments : Various types of pumps.

Material Handling Equipment : Conveyors : belt & screw type, Pumps & chutes, Tremies, Drilling equipments, Compaction & soil stabilizing equipments, Pile driving equipments, etc.

Concreting Equipment : Weigh batchers, Mixers; tilting, horizontal axis, Pan, transit etc : storage silo, Vibrators : needle, screed, form, etc, guniting and grouting equipments

Selection & Maintenance of Equipment : Factors affecting selection : efficiency, power consumption, etc; Cost-benifits, Hire-purchase, owning operating, Economy, safety etc. Sources of equipments Replacement, Equipment records, optimum utilisation.

TEXTBOOKS :

Construction equipment planning	Mahesh Verma
Construction planning, equipment & methods	Peurifoy R. L.

REFERENCES :

'Construction equipment'	Russell
'Construction equipment & machinery'	Harris Frank

703 Engineering Contracts, Tendering & Specifications

Teaching Scheme		*Examination Scheme*					
Th	*Tu/pr.*	*Theo. mark*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	-	100	3	50	-	-	150

Contracts : Definition, Meaning, Elements of contract (valid contract), Forms of contract, Termination of contract, Labour contracts, Negotiated contract, schedule of prices contracts, demolition of contracts, responsibilities of Contracter, Engineer & Owner, contract between owner and engineer. Earnest money and Security deposite, mobilisation fund.

Condition of Contracts : Clauses of condition of contracts, condition of contracts in outlines, liquidated damages, contracts disputes & settlements, standing contract (zonal, yearly), contract documents, labour law and other acts applicable to construction, General & special conditions of contracts

Arbitration : Meaning, purpose, matters to be referred to the arbitration, quality, process of appointing arbitrator, types of arbitration (sole, umpire, joint), power & scope of arbitration, arbitration process, arbitration awards, revocation of arbitration, contract tribunals

Specification : Meaning, definition, object, Importance, use, types of specification (Brief & Detailed), General and special specification, classification, specification for material, specification for workmanship, design of specification, principles of specification writing, specification outlines, Technical specification.

Tendering : Meaning of tender.types of tender (open, limited, Negotiated, global, local), prequalification and post-qualification of contractors.Tender documents,preparation of tender, opening of tender, mode of submission of tender, Method of tender scrutiny, Acceptence of Tender, Revocation of Tender, works executed without a contract, special condition of contracts, advertisements, unbalanced tender.

TEXT BOOKS :

'Elements of Estimating and costing'	S. C. Rangwala
'Engineering contracts and specifications'	Robert W. Abbett
'Estimating and costing'	B. N. Datta

REFERENCES :

Indian contract act, Arbitration act, Land ceiling, aquisition & tribunal acts Civil Engineering Contracts & Estimates Vol I Contracts B.S.Patil

704. Construction Management-I

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	-	100	3	50	-	-	150

Introduction : Need for scientific management of project, special aspect of construction industry, scope of the industry.

Construction As Industry : Special characteristics of construction industries, general concepts of managements, Engineer as manager, engineering economy in construction project.

Material Management : Scope of material management, Importance of material management, object common building material, stages of material management register or reputed suppliers and manufacturers, quantities, phasing the supply schedule, determining the priorities; Initiating purchase formalities, placing of orders, Inspection, acceptance & Issue, monitoring, purchase and supply, site engineer as material engineer, storage of material, Inventory control need, [illegible] essential steps, advantages, Inventory built up. Economic ordering quantity, procurement cost, Inventory carrying cost, spare part management & planning, factors governing.

Personnel **Management :** Special characteristics, man power planning, Recruitment, placements, Training and Industrial motivation, performance appraisal, industrial relation, Aspect of administration, public relation, welfare measures.

Management of Construction Plants and Equipments : Equipment planning, extent of mechanism, forecasting equipment. requirements, selection of equipment, purchase of equipments, owning & operating cost, economic life, sources of equipments.

Use of Appropriate Technology in Construction : Choice of technology, foreign & Indian Technology, condition & other sophisticated Technologies.

TEXT BOOKS :

'Management in construction Industries'	P. P. Dharwadker
'Construction planning,equipment & methods'	R. L. Peurifoy
'Civil Engineering Management'	O. N. Wakhlu

REFERENCES :

Management techniques applied to construction Industries	R. Oxley & J. Poskitt
Construction equipments and management	S. C. Sharma

IS 10067-1982,10302-1982 I.S. 082-1977,7272 part I :1974

705. Project Management-I

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr*	*Theo marks*	*hr*	*Sess marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	-	100	3	50	-	-	150

Introduction : Meaning, definition, functions, principle , process & project life cycle.

Organizational Structure : Function of head, Regional office and project managements, function of unit, chief engineer, preparation of Bid, Financial control, personal and administration planning and design, management information system, vigilance, organization as resource.

Project Planning : Project identification, project preparation, project appraisal, Negotiation, project approval, detailed project planning, project implementation, project monitoring and control, project evaluation.

Construction Planning : Necessity, construction stages, choice and project life cycle, planning technique and their merits and demerits.

Net Work : AOA & AOL presentation, single and over lapping relationship, preparing project network, CPM & PERT, Analysis of net work, time-cost trade off.

Construction Scheduling : Schedule technique, bar chart, critical path method, PERT

Resource Scheduling : Material, manpower, machinery and energies, single resource - single project, multiple resource -single project problem.

Project Information, Monitoring & Control : Management information system (MIS), Need of MIS, Nature of MIS, Management by exception, Financial return, company reports, use of computer, speed of communication, Schedule & budget, case flow planning, updating, forecasting for activity, cost control, time control, delay in construction, reasons & remedies

TEXT BOOK :

'Construction planning and management'	P. S. Gahlot & B.M.Dhar
'Construction planning, equipment & methods'	R. L. Peurifoy

REFERENCES :

'Project management for construction'	Chris Mentrickson
'Civil Engineering management'	O. N. Wakhlu
'CPM in construction management'	O. Brien
'Management guide to PERT & CPM'	Wiest & Levy
'Project planning & control with CPM'	B. C. Punmia & Khandelwal
'Quantitative Methods in Construction'	
'Management' I & II	ISTE

706. Project-I

Teaching Scheme		*Examination Scheme*					
Th.	*Tu pr.*	*Theo. marks*	*hr*	*Sess marks*	*Pr./Oral marks*	*Term work*	*Total marks*
-	10	-	-	-	75	75	150

Planning, design & execution details of one Project of Residential/Commercial/Public/Industrial structure

TERMWORK/ SEMINAR :

Semester end presentation of the work in the form of Project Report & Jury/oral .

Semi. VIII

801. Design of Steel, Masonary and Timber Structures

Teaching Scheme		*Examination Scheme*					
Th	*Tu pr.*	*Th. marks*	*hr*	*Sess marks*	*Pr Oral marks*	*Term work*	*Total marks*
5	4	100	4	50	50	50	250

Steel Structures : Connections stiffened and Unstiffened moment and shear resisting structural connections, design and detailing of connection between roof truss to column, column to base, beam [illegible] truss to bed block, Design of roof trusses. Various types of trusses and their selection in industrial structures, effect of wind and other loads on trusses and structural detailing. Design of beam & column. Design of Cantilever, shed, plate girder, industrial building (rolled and tubular) including gantry girder, foot over bridges

Plastic Methods : Elementary plastic theory of bending, moment curvature relationship plastic [illegible] plastic moment of resistance, shape factor, load factor, collapse load, collapse mechanism, equilibrium and yield conditions, analysis of beams and portals. Design of [illegible] using elastic and plastic approach

Timber Structures : Permissible stresses in timber as per IS [illegible] Tension and Compression members subjected to axial loading and moment, [illegible] built up beams and columns sections, [illegible] floor and roof truss design of connections. Design of [illegible] scaffolding...

Masonry Structures : Design of brick walls, effective thickness, wall under concentrated, uniformly distributed, eccentric and lateral loads, Design of wall with openings and masonry retaining wall. Introduction to design of reinforced brick slabs.

TEXT BOOKS :

'Brick and Reinforced Brick structures'	P. Dayaratnam
'Simplified design of wooden structures'	Ambrose
'Design of Steel Structures'	P. Dayaratnam
'Plastic methods'	B. G. Neal
IS : 800, SP : 20, IS : 883, IS : 905	

REFERENCES :

'Timber Design and Construction'	Henry Jacoby and Roland P. Davis
'Wood as building material : A guide for designers and Specifiers'	Wiley Publication.
'Steel Structures'	Arya and Ajmani
'Simplified design of Structural Masonry'	J. Ambrose
'Simplified design of Steel Structures'	J. Ambrose
'Design of Steel Structures'	S. K. Duggal

802. Maintenance and Rehabilitation

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
[illegible]	2	100	-	50	25	25	200

Maintenance of Structures : Maintenance of Buildings, Roads, Bridges and other Engineering Structures. Monitoring health of Civil Engineering Structures.

Construction Failures : Meaning of failure, Historical refences, Accountability & Liability, How to avoid failures, Investigation of failures.

Causes of Distress : Flow of forces, Design deffiriencies, Improper materials, Poor workmanship, Formworks, Supervision & Inspection, Natural calamities like fire, flood, earthquake etc.

Durability & Compatibility : Carbonation, Efflorescence, Weathering, Water permeation, Sulphate attack, termite attack and control etc.

Assessment of Distress : Destructive, semi-destructive & Non-destructive methods of testing of structures, Load test, core test, carbonation test, Rebound hammer, UPV test, Pull out tests etc.

Repair Material & Techniques : Grouts, Epoxies, Polymers, Quick setting/hardening concrete & mortars, Grouting and guniting, underpinning, protection of adjacent structures.

Evaluation of Repaired Structures : Structural system, evaluation techniques, reliability of different techniques.

Miscellaneous : Demolition & dismantalling, Installation of services, Time management, cost control, safety control, underpinning, Management of Maintenance approach, material supervision, budgeting.

TERMWORK :

Termwork will be based on above topics containing detailed reports & case studies.

TEXT BOOKS :

'Learning from failures'	R. N. Raiker
'Building failures-Diagnosis & avoidance'	W. H. Ransom
'Building disaster & failures'	Geoff Scott
'Common defects in buildings'	HMSO Report
'Construction failures'	Jacob Field
'Lessons from failures of concrete'	Jacob Field
'Structural failures-Case studies'	R. Jagdish

803. Irrigation Engineering

Teaching Scheme		*Examination Scheme*					
Th.	*Tu/pr.*	*Theo. marks*	*hr*	*Sess. marks*	*Pr. Oral marks*	*Term work*	*Total marks*
4	-	100	3	50	-	-	150

Introduction : Definition, Necessity, Benefits of irrigation, [illegible], Methods of irrigation : Uncontrolled flooding, free flooding, border strip method, contour farming, sprinkler and drip irrigation, problems.

Water Requirements of Crops : Function of irrigation water, classes and availability of soil water, depth and frequency of irrigation, duty, delta, factors affecting duty, consumptive use of water, crop rotation, assessment of irrigation water, problems.

Hydrology : Hydrologic cycle, methods of computation of rain fall, runoff, factors affecting it, hydrograph analysis, unit hydrograph and S-curve hydrograph.

Ground Water : Well irrigation, aquifer, aquifuge, sp. retention, sp. yield, etc., well hydraulics, capacity of well, fully and partially penetrating artesian well, tube well, open well, advantages and disadvantages of well irrigation over canal irrigation, other sources of ground water.

Gravity Dams : Forces acting on gravity dam, stability analysis, [illegible] profile, practical profile, high and low dams, Problems.

Earth Dams : Types, causes of failures, seepage and stability analysis, [illegible] protection, design consideration in earthquake [illegible].

Flow Irrigation : Canals, introduction to silt theories, cross drainage work, meandering, causes, river training works, groynes, marginal bunds, levees, weir on permeable soil, canal fall, distribution systems.

Water Logging : Effects, causes and remedial measures.

TEXT BOOK :

'Irrigation and hydraulic structure'	S. K. [illegible]
'Irrigation and hydraulic structures'	B. C. Punmia
'Irrigation and hydraulic structures'	[illegible]

REFERENCES :

'Irrigation and hydraulic structures'	Arora
'Irrigation Engineering Vol I to [illegible]'	K. B. Khushlani

804. Construction Management [illegible]

[illegible]

Construction Management for Different Buildings : [illegible] fall & [illegible] buildings [illegible]

Safety in Construction and Insurance : [illegible]

Quality Control in Construction : [illegible] manuals, ISO [illegible]

Automation in Construction Engineering : [illegible]

[illegible]

TEXT BOOKS :

'Management in construction industry'	P. P. Darwadkar
'Construction planning,equipment & methods'	R. L. Peurifoy
'Construction equipment and its management'	S. C. Sharma

REFERENCES :

'Civil engineering managements'	O. N. Wakhlu

805. Project Management II

Teaching Scheme		Examination Scheme					
Th	Tu pr	Theo. marks	hr	Sess marks	Pr./Oral marks	Term work	Total marks
3	-	100	3	50	-	-	150

Financial Analysis : Methods, factors, purpose. Finance for investment in real property, Terms of borrowing, Sources of borrowing, gearing and equity, financial verses economical analysis cost-benifit ratio.

Financial Management & Accounting : Finance as resource, Important function, tender costing, financial control, unit level working, service functions, financial management for export contract, project cost analysis, managerial accounting, Role and Scope of management account, Accounting concept & principles. Under standing of financial statements, balance sheet, profit and loss account, cost account (direct and indirect cost), fixed and variable cost unit costing, job costing, allocation and appointment of cost, Accounting for labour, material & over head cost.

Principles of Management : History of the development of management thought, concept and scope of management, management functions ad processes planning, organizing, staffing, directing, controlling and evaluating, marketing process and strategies relevant to construction industry.

Management Development and Training Needs : Need of management and training for ... manager, shortage of skill, wage element. Accident and health hazards. ... Advantages of training.

Corporate Plan for Construction Organization : Need of corporate plan, adaptive ... participative planning, pioneering effort, limitations of the plan, case study of corporate plan.

TEXT BOOKS :

Management in construction Industries	P. P. Dharwadker
Construction planing, equipments & methods	R. L. Peurifoy
Construction equipment and its management	S. C. Sharma

References :

Civil Engineering management	O. N. Wakhlu
Management technique applied to construction industries	R. Oxley & J. Poskitt
Value Engineering in Construction Industry	Alphouse J. Dell Isola
Value Engineering	A. E. Mudgl
Civil Engineering Construction	Antil and Woodhead

806. Project II

Teaching Scheme		Examination Scheme					
Th	Tu pr	Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
-	10	-	-	-	75	75	150

Students will work on site on a topic of current interest based on construction, laboratory, management and other related themes.

TERMWORK/ SEMINAR :

Semester end presentation of the work in the form of Project Report & Jury/oral.

પરિશિષ્ટ '૩૬/૧'

કામકાજ ક્રમાંક ૩ (૧)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post (Open) of the Director in the Educational Media Research (EMRC) Centre in the Gujarat University, Ahmedabad-380 009 was held on Saturday the 12th July, 1997 at 9 a.m. prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor — Present
2. Prof. E. V. Chitnis, Member — Present
3. Prof. M. M. Chaudhari, Member — Present
4. Shri B. S. Bhatia, Member — Present.

The following candidates were called for interview :

1. Shukla Dilipkumar A. — Present
2. Avashia Dhiren A. — Present
3. Sheth Niranjan K. — Present
4. Patel Tilottama I. — Present
5. Vijay Sharma — Present
6. Dave Urvesh S. — Present
7. Trivedi Himanshu C. — Present
8. Jhaveri Rajesh M. — Present
9. Mehta Malti V. — Present
10. Trivedi Divyesh K. — Present
11. Shah Vismay K. — Present
12. Dalal Yasin A. — Present

After interviewing the candidates who were present and considering their respective merits, the Committee recommends as under :

Shri Dhiren Avashia be appointed Director.

Prof. S. B. Vora
Vice-Chancellor
Prof. E. V. Chitnis
Prof. M. M. Chaudhari
Shri B. S. Bhatia

પરિશિષ્ટ '૩૬/૨'

કામકાજ ક્રમાંક ૩ (૨)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post (Open) of Professor in Law in the University School of Law, Gujarat University, Ahmedabad-380 009 was held on Saturday the 12th July, 1997 at 3 p.m. prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor — Present
2. Shri T. Y. Mehta — Present
3. Shri M. S. Pandit — Present
4. Prof. B. M. Shukla — Present.

The following candidates were called for interview :

1. Pathak Harshendu S. — Present
2. Indirayan Nirbhayakumar — Present
3. Sharma Bhanwar Lal — Present

After interviewing the candidates who were present and considering their respective merits the Committee recommends as under :

Shri H. S. Pathak be appointed as a Professor of Law.

Prof. S. B. Vora
Vice-Chancellor
Shri T. Y. Mehta
Shri M. S. Pandit
Prof. B. M. Shukla

પરિશિષ્ટ '૩૬/૩'

કામકાજ ક્રમાંક ૩ (૩)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post (S.T.) of Reader in Psychology in the University School of Psychology, Gujarat University, Ahmedabad-380 009 was held on Saturday the 12th July, 1997 at 4 p.m. prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor	Present
2. Prof. Pramodkumar	Present
3. Prof. D. M. Pestonjee	Present
4. Prof. S. Majmudar	Present.

The following candidates were called for interview :

1. Shikari Ashvinsinh G.	Present.

After interviewing the candidates who was present and considering his respective merits, the Committee recommends as under :

The candidate was duly interviewed and at the time of interview, it appeared that papers the five papers that he has published have been published in reprinter

Prof. S. B. Vora
Vice-Chancellor
Prof. Pramodkumar
Prof. D. M. Pestonjee
Prof. S. Majmudar.

પરિશિષ્ટ '૩૬/૪'

કામકાજ ક્રમાંક ૩ (૪)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post (SEBC) of Lecturer in Botany in the University School of Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 12th July, 1997 at 4.30 p.m. prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor	Present
2. Prof. P. M. Mehta	Present
3. Prof. C. K. Shah	Present
4. Dr. O. P. Saxena, invitee	Present.

The following candidates were called for interview :

1. Chaudhary Neeta S.	Absent
2. Gohil Amit N.	Present
3. Prajapati Veena N.	Present.

After interviewing the candidates who were present and considering their respective merits, the Committee recommends as under. The performance of both candidate was extremely Post. They were not able to reply even basic questions of under graduate level. So the committee remenly that the post be re-advertise.

Prof. S. B. Vora
Vice-Chancellor
Prof. P. M. Mehta
Prof. C. K. Shah
Dr. O. P. Saxena.

પરિશિષ્ટ '૩૬/૫'

કામકાજ ક્રમાંક ૩ (૫)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post of Professor in Sanskrit (Open) in the University School of Languages, Gujarat University, Ahmedabad-380 009 was held on Saturday the 26th July, 1997 at 9 a.m. prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor	Present
2. Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3. Prof. S. D. Joshi	Present
4. Prof. B. G. Shukla	Present
5. Prof. S. G. Kantavala	Present.

The following candidates were called for interview :

1. Mehta Rashmikant P.	Present
2. Pandya Vijay D.	Present
3. Bhatt Vasantkumar M.	Present.

After interviewing the candidates who were present and considering their respective merits, the Committee recommends as under :

Shri Vasantkumar M. Bhatt be appointed as Professor of Sanskrit.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. M. M. Chaudhari
Shri B. S. Bhatia

પરિશિષ્ટ '૩૬/૬'

કામકાજ ક્રમાંક ૩ (૬)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post of Reader in Sanskrit (Open) in the University School of Languages, Gujarat University, Ahmedabad-380 009 was held on Saturday the 26th July, 1997 at 10 a.m. prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor	Present
2. Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3. Prof. S. D. Joshi	Present
4. Prof. B. G. Shukla	Present
5. Prof. S. G. Kantavala	Present

The following candidates were called for interview :

1. Jhala Suhas D.	Present
2. Shastri [illegible] K.	Present
3. Chok[illegible] Kamlesh C.	Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :

Shri Kamleshkumar C. C[illegible]ksi be appointed as Reader in Sanskrit.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. S. D. Joshi
Prof. B. G. Shukla

પરિશિષ્ટ '૩૬/૭'

કામકાજ ક્રમાંક ૩ (૭)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post of Reader in Philosophy (Open) in University School of Psychology, Philosophy and Education, Gujarat University, Ahmedabad-380 009 was held on Saturday the 26th July, 1997 at 11 a.m. prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1.	Prof. S. B. Vora, Vice-Chancellor	Present
2.	Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3.	Prof. H. M. Joshi	Present
4.	Prof. R. V. Tanna	Present
5.	Prof. M. V. Bakshi	Present.

The following candidates were called for interview :

1.	Trivedi Bhavna P.	Present

After interviewing the candidate who was present and considering her relevant merits, the Committee recommends as under :

Ms. Bhavna Trivedi be appointed as Reader in Philosophy.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. H. M. Joshi
Prof R. V. Tanna
Prof. M V. Bakshi

પરિશિષ્ટ '૩૬/૮'

કામકાજ ક્રમાંક ૩ (૮)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the Post of Reader (Open) in Life Science in the University School of Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 26th July, 1997 at 12 Noon prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1.	Prof. S. B. Vora, Vice-Chancellor	Present
2.	Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3.	Prof. C. K. Shah	Present
4.	Prof. L. K. Parekh	Present
5.	Prof. A. C. Shah	Present
6.	Prof. Y. K. Agrawal	Present.

The following candidates were called for interview :

1.	Jain Nayankumar K.	Present
2.	Dr. Jangala Isaiah N.	Present
3.	Patel Baldev V.	Present
4.	Jain Bhanukumar K.	Absent

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :

Shri Nayankumar Jain be appointed as Reader in Life Science.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. C. K. Shah
Prof. L. K. Parekh
Prof. A. C. Shah
Prof. Y. K. Agrawal

પરિશિષ્ટ '૩૬/૯'

કામકાજ ક્રમાંક ૩ (૯)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the Post of Reader in Physics (SEBC) in the University School of Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 26th July, 1997 at 2 p.m. prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1.	Prof. S. B. Vora, Vice-Chancellor	Present
2.	Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3.	Prof. P. D. Bhavsar	Present
4.	Prof. Jitendra Parikh	Present
5.	Prof. Abhijeet Sen	Present
6.	Prof. V. B. Gohil, invittee	Present.

The following candidates were called for interview :

1.	Jotania Rajshree B.	Present
2.	Gajjar Pankajkumar N.	Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :-

Ms. Rajeshree S. Jotania be appointed as Reader in Physics.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. P. D. Bhavsar
Prof. Jitendra Parikh
Prof. Abhijeet Sen
Prof. V. B. Gohil

પરિશિષ્ટ '૩૬/૧૦'

કામકાજ ક્રમાંક ૩ (૧૦)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the Post of Reader in Economics (Open) in University School of Social Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 26th July, 1997 at 2-30 p.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1.	Prof. S. B. Vora, Vice-Chancellor	Present
2.	Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3.	Prof. R. J. Modi	Present
4.	Prof. B. H. Dholakia	Present
5.	Prof. B. B. Patel	Present
6.	Prof. V. P. Bhardwaj, invittee	Present.

The following candidates were called for interview :

1.	Saramma A. D.	Present
2.	Bhatt Kartik M.	Present
3.	Sidhu [illegible] A.	Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :

1. Shri K. M. Bhatt be appointed as Reader in Economics.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. R. J. Modi
Prof. B. H. Dholakia
Prof. B. B. Patel
Prof. V. [illegible]

પરિશિષ્ટ '૩૬/૧૧'

કામકાજ ક્રમાંક ૩ (૧૧)

Confidential :

A meeting of the Selection Committee for recommending names for appointment to the two Post of Lecturer in Economics (SEBC) in University School of Social Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 26th July, 1997 at 3 p.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor	Present
2. Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3. Prof. R. J. Modi	Present
4. Prof. B. H. Dholakia	Present
5. Prof. B. B. Patel	Present
6. Prof. V. P. Bharwaj	Present.

The following candidates were called for interview :

1. Prajapati Pradeep P.	Present
2. Gadhavi Ila B.	Present
3. Bhatia Roman K.	Present
4. Gadhavi Kailashdan R.	Present
5. Pardeshi Sanjaykumar R.	Present
6. Gajjar Kashmira I.	Absent
7. Master Navneetkumar S.	Absent
8. Sendhav Haribhai H.	Absent

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under : 1. Shri P. P. Prajapati and 2. Shri S. P. Pardeshi be appointed as Lecturers in Economics.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. R. J. Modi
Prof. B. H. Dholakia
Prof. B. B. Patel
Prof. V. P. Bhardwaj

પરિશિષ્ટ '૩૬/૧૨'

કામકાજ ક્રમાંક ૩ (૧૨)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post of Professor in Sociology (Open) in the University School of Social Sciences, Gujarat University, Ahmedabad-380 009 was held on Sunday the 27th July, 1997 at 9 a.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor	Present
2. Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3. Prof. Narayan Sheth	Present
4. Prof. P. J. Patel	Present
5. Prof. S. L. Doshi	Present.

The following candidates were called for interview :

1. Desai Dhirajlal B.	Present
2. Trivedi Jayprakash M.	Present
3. Makwana Manubhai H.	Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :

That the process be done again & Post be re-advertise.

Prof. S. B. Vora (Vice-Chancellor)
Prof. K. S. Shastri (Pro-Vice-Chancellor)
Prof. Narayan Sheth
Prof. P. J. Patel
Prof. S. L. Doshi

પરિશિષ્ટ '૩૬/૧૩'

કામકાજ ક્રમાંક ૩ (૧૩)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post of Lecturer in Library and Information Science (SEBC) in the University School Library, Gujarat University, Ahmedabad-380 009 was held on Sunday the 27th July, 1997 at 10 a.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor	Present
2. Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3. Shri V. W. Karniva	Present
4. Shri S. M. Chappa	Present

The following candidates were called for interview :

1. Chaudhari Rameshbhai S.	Present
2. Chaudhari Bhagvanbhai K.	Present
3. Bhutadiya Narsangbhai B.	Present
4. Gadhavi Geeta N.	Present
5. Makwana Jaswantsinh A.	Present
6. Shaikh Ahesan F.	Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :

Ms. Geeta Gadhavi be appointed as Lecturers in Library Science

Prof. S. B. Vora
(Vice-Chancellor)
Prof. K. S. Shastri
(Pro-Vice-Chancellor)
Shri V. W. Karniva
Shri S. M. Chappa

પરિશિષ્ટ '૩૬/૧૪'

કામકાજ ક્રમાંક ૩ (૧૪)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to the One Post of Professor in Business Management (Open) in B. K. School of Business Management, Gujarat University, Ahmedabad-380 009 was held on Sunday the 27th July, 1997 at 11-30 a.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor	Present
2. Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3. Prof. M. N. Vora	Present
4. Prof. S. I. Bhatwagiri	Present
5. Prof. M. R. Dikshit	Present
6. Prof. D. J. Mehta, invitee	Present

The following candidates were called for interview

1. C. Gopalkrishnan	Present
2. Brahmbhatt Arvindkumar C.	Present
3. Patel Dinubhai R.	Present
4. Oza Harishchandra S.	Present
5. Singh Indra Sen	Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :

Shri C. Gopalkrishnan be appointed as Professor of Business Management.

Prof. S. B. Vora
(Vice-Chancellor)
Prof. K. S. Shastri
(Pro-Vice-Chancellor)
Prof. M. N. Vora
Prof. S. I. Bhatwagiri
Prof. M. R. Dikshit
Prof. D. J. Mehta

પરિશિષ્ટ '૩૬/૧૫'

કામકાજ ક્રમાંક ૩ (૧૫)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to One Post of Teaching Research Associate (TRA) (Open) in B. K. School of Business Management, Gujarat University, Ahmedabad-380 009 was held on Sunday the 27th July, 1997 at 2 p.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1.	Prof. S. B. Vora, Vice-Chancellor	Present
2.	Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3.	Prof. M. N. Vora	Present
4.	Prof. M. R. Dikshit	Present
5.	Prof. D. J. Mehta, invittee	Present

The following candidates were called for interview :

1.	Jain Ingita	Present
2.	Sepovadia Vrajlal K.	Absent
3.	Thakore Digvijaysinh G.	Present
4.	Pandya Bharat R.	Absent
5.	Dutt Jyoti A.	Absent
6.	Mehta Alap A.	Present
7.	Parikh Margie Sunil	Present
8.	Nair Satish K.	Present
9.	Mankad Kalpana V.	Apsent
10.	Dave Harshida H.	Present
11.	Patel Amish I.	Absent
12.	Oza Pallavi P.	Present
13.	Pandya Jayraj K.	Absent

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :

The following be appointed as TRA in order of reference :

1. Ms. Margie Parikh
2. Ms. Ingita Jain
3. Shri Satish Nair.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. M. N. Vora
Prof. M. R. Dikshit
Prof. D. J. Mehta

પરિશિષ્ટ '૩૬/૧૬'

કામકાજ ક્રમાંક ૩ (૧૬

Confidential :

A meeting of the Selection Committee for recommending names for appointment to Two Posts (One for SC and One for Open) of Lecturer in Mathematics, University School of Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 16th August, 1997 at 9 a.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1.	Prof. S. B. Vora, Vice-Chancellor	Present
2.	Prof. K. S. Shastri, Pro-Vice-Chancellor	Present
3.	Prof. M. H. Vasavada	Present
4.	Prof. P. B. Ramanujan	Present
5.	Prof. I. H. Sheth, invittee	Present

The following candidates were called for interview :

1.	Dharman R.	Present
2.	Kulshreshtha V. A.	Present
3.	Acharya Urvashi Kalidas	Present
4.	Nayak Pragnaben C.	Present
5.	Patel Mukeshbhai D.	Present
6.	Darji Rajeshkumar M.	Present
7.	Thaker Kaushik V.	Present
8.	Delvadia Nilibahen G.	Present
9.	Patel Satishchandra R.	Absent
10.	Chaudhary Rajeshkumar M.	Present
11.	Shrimali Narendra P.	Absent
12.	Pathak Naimisha H.	Present
13.	Prajapati Jagdish S.	Absent
14.	Nagar Anima P.	Present
15.	Parmar Sanjaykumar B.	Present
16.	Pandya Nikunj R.	Present
17.	Patel Bhailalbhai P.	Present
18.	Joshi Dhruti R.	Present
19.	Kadia Atulkumar V.	Present
20.	Patel Humanshu C.	Present
21.	Patel Darshana A.	Present
22.	Brahmbhatt Chandrakant G.	Present
23.	Joshi Vibhuti G.	Present
24.	Thakar Janakkumar B.	Present
25.	Koya Punamchandra Rao	Present
26.	Shah Rajiv B.	Present
27.	Patel Maheshkumar M.	Present
28.	Modi Neena R.	Present
29.	Prajapati Gaurangi S.	Present
30.	Kapadia Harkishan R.	Present
31.	Mishra Rajesh	Present
32.	Sharija Radhakrishnan	Present
33.	Solanki Maganlal G.	Present
34.	Chauhan Tarunkumar D.	Present
35.	Sanghavi Rajesh C.	Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under

For S.C. category Shri Narendra Shrimali be appointed as a Lecturer in Mathematics. For Open category Shri Kaushik Thaker be appointed as a Lecturer in Mathematics.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. M. H. Vasavada
Prof. P. B. Ramanujan
Prof. I. H. Sh

પરિશિષ્ટ '૩૬/૧૭'

કામકાજ ક્રમાંક ૩ (૧૭)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to one Post (Open) having experience in Molecular Biology/Gentics/Bio-chemistry) of Lecturer in Zoology, in the University School of Sciences, Gujarat University, Ahmedabad-380 009 was held on Saturday the 16th August, 1997 at 2 p.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor — Present
2. Prof. K. S. Shastri, Pro-Vice-Chancellor — Present
3. Prof. Bonny Pilo — Present
4. Prof. Pankaj Hiradhar — Present
5. Prof. N. J. Chinoy, invittee — Present

The following candidates were called for interview :

1. Sinha Kabita — Present
2. Rajena Koshy — Present
3. Shah Kamleshkumar D. — Present
4. Chandel Divya — Present
5. Joshi Deepali M. — Present
6. Kadem Ramudu — Present
7. Das Monalisa R. — Present
8. Dharmalingam P. — Present
9. Bhatt Punita M. — Absent
10. Chattree Seema — Present
11. Yadav Sangita — Absent
12. Mathew James — Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :

The following be selected as Lecturer in Zoology in order of Professor (1) Ms. Divya Chandel (2) S. . L. D. Shah.

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. Bonny Pilo
Prof. Pankaj Hiradhar
Prof. N. J. Chinoy

પરિશિષ્ટ '૩૬/૧૮'

કામકાજ ક્રમાંક ૩ (૧૮)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to One Post (Open) of Lecturer in Computer Science, Rollwala Computer Centre, Gujarat University, Ahmedabad-380 009 was held on Saturday the 16th August, 1997 at 4 p.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor — Present
2. Prof. K. S. Shastri, Pro-Vice-Chancellor — Present
3. Prof. B. D. Shriyan — Present
4. Prof. D. R. Kulkarni — Present
5. Prof. A. G. Agrawal — Present

The following candidates were called for interview :

1. Doshi Jyotika R. — Present
2. Agrawal Hemlata S. — Present
3. Lobo Flavia Monica — Present

4. Pareek Jyoti — Present
5. Lakhani Minazbanu A. — Present
6. Gangwani Jayesh K. — Present
7. Patel Ashokkumar R. — Present
8. Gupta S. Rashmi — Present
9. Patel Jasmin M. — Absent
10. Vyas Hiteshkumar N. — Present
11. Patel Brijesh Kumar — Absent
12. Sood Sonia — Present
13. Sharma Anuradha — Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under :

The following be appointed as Lecturer for two posts : (1) Mr. Lobo Flavia Monica (2) Ms. Jyoti Pareek

Prof. S. B. Vora
Vice-Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. B. D. Shriyan
Prof. D. R. Kulkarni
Prof. A. G. Agrawal

પરિશિષ્ટ '૩૬/૧૯'

કામકાજ ક્રમાંક ૩ (૧૯)

Confidential :

A meeting of the Selection Committee for recommending name for appointment to One Post (Open) of Lecturer in Urdu, University School of Languages, Gujarat University, Ahmedabad-380 009 was held on Saturday the 16th August, 1997 at 5-30 p.m. Prof. S. B. Vora, Vice-Chancellor, Gujarat University presided.

The attendance of the Selection Committee was as under :

1. Prof. S. B. Vora, Vice-Chancellor — Present
2. Prof. K. S. Shastri, Pro-Vice-Chancellor — Present
3. Prof. Varis Alwi — Present
4. Prof. Abdul Huq — Present
5. Prof. M. G. Qureshi, invittee — Present

The following candidates were called for interview :

1. Shaikh Khurshidakhtar M. — Present
2. Bukhari Bilkisbanu B — Present
3. Nagori Majidkhan N. — Present
4. Shaikh Sharfuddin N — Present
5. Ansari Karimolla M — Present
6. Saiyad Nasiruddin U — Present
7. Boxwala Zakerabanu A. — Present
8. Shaikh Akhtarshah U — Present
9. Ansari Afzalhusain — Absent
10. Ansari Mohammadhusein — Present
11. Shaikh Gulamraziue K — Absent
12. Shaikh Mohammed Iqdal A — Present

After interviewing the candidates who were present and considering their relevant merits, the Committee recommends as under

Shri Ansari Karimulla be appointed as Lecturer in Urdu

Prof. S. B. Vora
Vice Chancellor
Prof. K. S. Shastri
Pro-Vice-Chancellor
Prof. Varis Alwi
Prof. Abdul Huq
Prof. M. G. Qureshi

પરિશિષ્ટ '૩૭'

કામકાજ ક્રમાંક ૫ (૧)

Ordinance 120-C :

(a) An institution other than a college applying for recognition as a institution of research or specialised studies shall satisfy the Executive Council in the first instance regarding the following requirements

(1) That it has at least five years' standing as an institution of higher learning and research in the subject to its credit

(2) That it has on its roll the following minimum staff in the subject :

(i) Director in the scale of University Professor.

(ii) In addition to Director, one teacher in the scale of Reader and one teacher in the scale of Lecturer.

(iii) Adequate number of research fellows with a consolidated fixed pay prescribed by the University

(3) That it has a well-equipped library with an adequate number of books, periodicals, old numbers of periodicals, manuscripts, if necessary, etc., in the subject.

(4) That in the case of experimental subjects it has adequate Laboratory and/or museum facilities for post-graduate teaching and research.

(5). That it has adequate quantum of published work through the research activities of its staff in the form of research papers, articles, reports, etc.

(b) All applications for recognition, extension of recognition or continuation of recognition of an institution shall be sent to the Registrar in the form prescribed by the Executive Council so as to reach him on or before the first of August of the year preceding the year form which recognition is intended to take effect.

Every application for recognition shall be accompanied with a fee of Rs 10,000/- provided, however, that application for continuation of extension of recognition shall be only Rs. 2,000/-. Provided further that in case recognition is not granted by the University or institute withdraws application for recognition within three months, half of the application fee will be refunded.

પરિશિષ્ટ '૩૮'

કામકાજ ક્રમાંક ૫(૨)

Revised Syllabus w.e.f. September, 1997

B.E. Semester III Teaching Scheme & Examination Scheme

(C.M.E.,E.C.,I.C.,C.E.,Chem., Rub., Pl.,T.T., C-C.T.M.)

Applied Mathematics—II

Teaching Scheme		*Examination Scheme*						
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	—	100	3	—	—	—	100

1. **Fourier Series** : Periodic functions. Dirichlet's conditions, Fourier series. Euler's formulae, Fourier expansion of periodic functions with period 2π, Fourier series of even and odd functions. Fourier series of periodic functions with arbitrary periods, Half range Fourier series, Harmonic analysis.

2. **Laplace Transforms** : Motivation, Definition, Linearity property, Laplace transforms of elementary functions, Shifting theorem Inverse Laplace transforms, Laplace transforms of derivatives and integrals, Convolution theorem, Application of Laplace transforms in solving ordinary differential equations, Laplace transforms of periodic, Unit step and Impulse functions.

3. **Ordinary Differential Equations** : Linear differential equations of higher order with constant coefficients, Method of variation of parameters, Higher order linear differential equations with variables coefficients (Cauchy's and Legendre forms), Simultaneous linear differential equations, Models for the real world problems and their solutions in particular, Modelling of electric circuits, Deflection of beams, Free oscillations, Forced oscillations, Resonance, Solution of Bessel and Legendre equations by series method, Definition and properties of Bessel's functions, Legendre's polynomials and properties like recurrence relations orthogonality.

4. **Partial Differential Equations** : Formation of Partial differential equations, Directly integrable equations, Models of Engineering problems leading to first order partial differential equations, Lagrange's equation, Solutions of special type of first order partial differential equations, Homogeneous linear equations with constant coefficients, Applications of partial differential equations, Boundary value problems and method of seperation of variables, Modelling of vibration of a streched string-one dimensional wave equation.

5. **Numerical Methods** : Motivation, Errors, Tunction error, Rounded off error, Absolute error, Relative error and Percentage error, Solution of algebraic and transcendental equations by Newton-Raphson, Bisection, False position and extended iteration methods. Convergence of these methods.

Reference Books

1.	Dr. B. S. Grewal	Higher Engineering Mathematics, Khanna Publishers, New Delhi
2.	Prof. Wartikar & Wartikar	Engineering Mathematics - Vol. I, II. Pune Vidyarthi Griha, Pune.
3	Dhavan & Shrivastav	Engineering Mathematics, Danpat Rai & Sons, New Delhi.
4.	S. S. Sastry	Engineering Mathematics-Vol. I & II. Printice Hall of India, New Delhi
5.	P. D. S. Verma	Mathematics for Engineering Students, Kalyani Publishers, Ludhiyana & Delhi
6.	N. P. Bali, Ashok Saxena & Iyengar	A Text Book on Engineering Mathematics, Laxmi Publication (P.) Ltd., New Delhi.
7	Kandasamy, Thilagavathi & Gunavathi	Engineering Mathematics Vol. I, I, III S. Chand & Co. (Pvt.) Ltd., New Delhi
8.	Chandrika Prasad	(1) A First Course in Mathematics for Engineers, (2) Mathematics for Engineers, (3) Advanced Mathematics for Engineers. Prasad Mudranalaya 7 Veli Avenue, Allahabad.
9	Kumbhojkar, G. V.	Engineering Mathematics Vol. I, II, III, IV C. Jamnadas & Co. Bombay
10	Majumdar, T	Engineering Mathematics Vol. I New Central Book Agency (P) Ltd., 8/1 Chintamani Das Lane, Calcutta
11.	Erwin Kreyszig	Advanced Engineering Mathematics (Fifth Edition), Wiley Eastern Ltd., New Delhi.

Revised Syllabus w.e.f. September, 1997

B.E. Semester-IV Teaching and Examination Scheme

(Civil and Mechanical)

Applied Mathematics-III

Teaching Scheme		*Examination Scheme*						
Theory	*practical*	*Theory marks*	*hr*	*Sess. marks*	*Pr./Oral mark*	*Term work*	*Total marks*
4	—	100	3	—	—	—	100

1. **Vector Calculus** : Reorientation, Differentiation of vectors, scalars and vector fields. Gradient of a scalar function, Directional derivative, Divergence and Curl of a vector function and their physical meanings, Line, Surface and Volume integrals, Green's theorem in plane Gauss's and Stoke's theorem (Without proof).

Irrotational, Solenoidal and conservative vector fileds, Cylindrical and spherical polar co-ordinates, Application to fluid mecahnics

2. **Function of Complex Variables** : Reorientation, Analytic function, Cauchy-Riemann equations in Cartesian and Polar forms, Harmonic functions, Conformal mappings, Application of Conformal mappings to fluid mechanics, Complex integration, Cauchy integration, Cauchy's integral theorem, Cauchy's integral formula

3. Finite **Differences and Difference Equations** : Finite differences. Interpolation, Finite difference operators (Forward, Backward and Central differences). Interpolation formulae : Newton's forward, Newton's backward, Lagrange's and Sterling's, Numerical differentiation. Numerical integration : Trapezoidal rule, Simpson's 1/3rd rule, Difference equations.
4. **Numerical Solutions of Ordinary and Partial—Differential Equations** : Solution of initial value problems of first order ordinary differential equations, Picard's method, Taylor series method, 4th order Runge-Kutta method, Finite difference methods of solving second order partial diferential equations with boundary conditions.
5. **Solution of System of Linear Equations** : Direct methods : Gauss elimination, Gauss Jordan and Crout's LU-factorization methods, Indirect methods : Gauss Seidel and Jacobi's methods

Reference Books

1. Dr. B. S. Grewal : Higher Enguneering mathematics, Khanna Publishers, New Delhi.
2. G. V. Kumbhoikar : Engineering Mathematics Vol. IV, C. Jamnadas, Bombay.
3. Chandrika Prasad : Mathematics for Engineers, Vol., II & III, Prasad Mudranalaya, Allahabad Advanced Mathematics for Engineers.
4. Erwin Kreyszig : Advanced Engineering Mathematics (Fifth Edition), Wiley Eastern Ltd., New Delhi.

Revised Syllabus w.e.f. September, 1997

B.E. Semester-IV Teaching and Examination Scheme

(E.C./I.C. Electrical)

Applied Mathematics-III

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	--	100	3	—	—	—	100

1. **Vector Calculus** : Reorientation. Differentiation of vectors, scalars and vector fields, Gradient of a scalar function. Directional derivative, Divergence and Curl of a vector function and their physical meanings, Line, Surface and Volume integrals, Green's theorem Gauss's and Stoke's theorem (Without proof). Irrotational, Solenoidal and conservative vector fileds, Clrvilinear co-ordinates Cylindrical and spherical polar Application to Electromagnetic fields.
2. **Functions of Complex Variables** : Reorientation, Analytic function, Cauchy-Riemann equations (Cartesian and Polar forms), Harmonic functions, Conformal mappings, Complex integration, Cauchy's theorem and integral formula singularities Taylor's and Laurents series Residue theorem, Evaluation of integrals using residues.
3. **Fourier Transforms** : Fourier integral theorem (only statement), Fourier Sine and Cosine integrals, Complex form of Fourier integral, Fourier Sine and Cosine transforms, Inverse Laplace transforms by residues, Solutions of boundary value problems using fourier transforms. Application to transverse vibration of a string and transmission lines.
4. Solution of Cubic by Cardon and Biquadratic equations by Ferrari's method
5. **Matrices** :Caley-Hamilton's theorem, Special matrices like Hermitian, Skew-Hermitian and Unitary. Quadratic forms.

Reference Books

1. Dr. B. S. Grewal : Higher Engineering Mathematics, Khanna Publishers, New Delhi.
2. Dr. Saxena, Bali and Ivenger : Engineering Mathematics, Laxmi Publications, New Delhi.
3. Prof. Wartikar & Wartikar : Engineering Mathematics, Vol. III, Pune Vidyarthi Griha, Pune.
4. Chandrika Prasad : (1) Mathematics for Engineers, (2) Advanced Mathematics for Engineers Prasad Mudranalaya, 7 Beli Avenue, Allahabad.
5. Erwin Kreysizig : Advanced Engineering mathematics (Fifth edition), Wiley Eastern Ltd., New Delhi

Revised Syllabus w.e.f. September, 1997

B.E. Semester-IV Teaching and Examination Scheme

(Computer Engineering & Information Technology)

401. Discrete Mathematics

Teaching Scheme		*Examination Scheme*					
Theory	*Tutorial*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
3	1	75	3	—	—	25	100

Objective of the Course : To introduce the mathematical tools needed to handle discrete structures such as finite set combinatories and finite graphs and mathematical rigour and discipline needed analyse algorithms.

The material can be broken into two parts, one based on the concept of modern algebra as applied to sequential machines and computer systems, the other based on graph and tree as applied to data structure and algorithms.

Course Content :

1. **Predicate Calculus (10%)** : Introduction, objectives, predicates, statement functions, variable and quantifiers, free and bound variables, special valid formulas involving quantifiers-theory of inference for the predicate calculus.
2. **Fuzzy Sets (10%)** : Some useful definitions, basic operations of fuzzy sets Image and inverse image, I-V Fuzzy sets; Fuzzy relations.
3. **Group Theory (20%)** : Definition and examples of semigroups, monoids and groups. Abelian group, cyclic group; subgroup, permutation groups, coset decomposition of groups, normal subgroups. Lagranges theorem.
4. **Lattices (20%)** : Poset, Lattice as a poset, properties of lattices, Lattices as algebraic systems, sublattices, direct product and homomorphism, complete lattices, bounds of lattices, distributive lattices, complemented lattice.
5. **Boolean Algebra (20%)** : Introduction, definition and properties, sub-boolean algebra direct product and homomorphship, atoms, stone's representation theorem. Boolean expressions and their equivalence. Minterm and Max terms. Boolean algebra, values of Boolean expressions, canonical forms, Boolean functions; symmetric Boolean functions.
6. **Graph Theory (20%)** : Basic concept of graph theory; Basic definitions, Path, reachability and connectedness, Matrix representation of graphs; Trees

Reference Books

1. Tremblay, J. P. & Manohar R. Discrete Mathematical Structures with applications to Computer Science; McGraw Hill New Delhi.
2. Rosen, Kenneth, H-Discrete Mathematics and its applications; Mc Graw Hill, New Delhi
3. Alan Doerr & Kenneth L. Applied Discrete structures for Computer Science; Galgotia Publications Pvt. Ltd., New Delhi.
4. Kolman, B. & Busby R. C. Discrete Mathematical Structures for Computer Science; Prasntice Hall of India Pvt. Ltd., New Delhi.
5. George J. Klir/Bo Yuan-Fuzzy sets and Fuzzy logic. Theory and applications. Printice Hall of India, New Delhi, 1997.

પરિશિષ્ટ '૩૯'

કામકાજ ક્રમાંક ૫ (૪)

ગુજરાત લૉ સોસાયટી દ્વારા બી.બી.એ.નો અભ્યાસક્રમ શરૂ કરવા અંગે તપાસસમિતિનો હેવાલ

ગુજરાત લૉ સોસાયટી દ્વારા બી.બી.એ.નો ત્રણ વર્ષનો અભ્યાસક્રમ શૈક્ષણિક વર્ષ ૧૯૯૭-૯૮થી શરૂ કરવા માટે ગુજરાત લૉ સોસાયટીની આવેલ અરજીના અનુસંધાનમાં ગુજરાત યુનિવર્સિટીએ નિયુક્ત કરેલ નીચે-તપાસસમિતિના સભ્યો તરીકે અમે તારીખ ૨૪-૧-૧૯૯૭ના રોજ સ્થળ પર રૂબરૂ મુલાકાત લીધી હતી. ગુજરાત લૉ સોસાયટીના ઑનરરી ડાયરેક્ટર શ્રી એન. આર. શાહે હાજર રહી જરૂરી સઘળી માહિતી પૂરી પાડી હતી. આ અભ્યાસક્રમ ચલાવવા માટે આ સંસ્થા પાસે નીચેની ભૌતિક સગવડો હાલ ઉપલબ્ધ છે :

(૧) સંસ્થા દ્વારા અનેક કૉલેજો અને સંસ્થાઓ ચલાવવામાં આવે છે અને તે પૈકીની એક એલ. એ. શાહ લૉ કૉલેજનું મકાન બપોરના સમયે સંપૂર્ણપણે ઉપલબ્ધ છે અને તે મકાનમાં વર્ગખંડો, કાર્યાલય તથા અન્ય જરૂરિયાતો માટેના ખંડો પર્યાપ્ત રીતે ઉપલબ્ધ છે. ભવિષ્યમાં સંસ્થાએ આ અભ્યાસક્રમો માટે પોતાનું અલગ મકાન બનાવવાનું આયોજન કરેલ છે.

(૨) સંસ્થા પાસે કૉમર્સ કૉલેજમાં ગ્રંથાલયની સારી સગવડ ઉપલબ્ધ છે. પરંતુ સંસ્થાએ આ અભ્યાસક્રમ માટેના ગ્રંથાલયમાં જરૂરી ખર્ચ અંગે ગુજરાત યુનિવર્સિટી જે શરતો મૂકે તે અનુસાર ખર્ચ કરવાની તૈયારી દર્શાવી છે.

(૩) સંસ્થા પાસે પોતાનું કૉમ્પ્યુટર સેન્ટર પૂરતી સુવિધા સાથે ઉપલબ્ધ છે. જરૂર પડ્યે વધારાનો ખર્ચ કરવાની પણ સંસ્થાએ તૈયારી બતાવી છે.

અમે આ સાથે જોડેલ શરતોને આધિન આ સંસ્થાને બી.બી.એ.ના અભ્યાસક્રમો ચલાવવા માટેનું જોડાણ હાલ પૂરતું એક વર્ષ માટે પ્રથમ વર્ષ બી.બી.એ. (F.Y.B.B.A.) (બે ડિવિઝન) (શૈક્ષણિક વર્ષ ૧૯૯૭-૯૮ માટે) આપવા ભલામણ કરીએ છીએ.

સહી

ડી. એમ. પેસ્ટનજી

વાય. કે. અગ્રવાલ

આર. એચ. વ્યાસ

એકેડેમિક કાઉન્સિલની ભલામણ

'આથી ઠરાવવામાં આવે છે કે ગુજરાત લૉ સોસાયટી, અમદાવાદ નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૧૫-૭-૧૯૯૭ સુધીમાં કરે તો તેને બી.બી.એ.ના અભ્યાસક્રમો શીખવવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

શરતો : પાર્ટ-૧ :

બી.બી.એ.ના જોડાણની શરતો

૧. સંસ્થા સ્વતંત્ર એકમ તરીકે રહેશે (કોઈ કૉલેજના ભાગ કે વિભાગ તરીકે નહીં) તેમજ પૂરા સમયની —બપોરની રહેશે.
૨. કાર્યભાર મુજબ યુનિવર્સિટીએ નિયત કરેલ લાયકાત ધરાવતા શિક્ષકોની નિમણૂક કરવામાં આવે.
૩. લાયકાત ધરાવતા ડાયરેક્ટરની નિમણૂક કરવામાં આવે.
૪. જરૂર મુજબ બિનશૈક્ષણિક સ્ટાફની નિમણૂક કરવામાં આવે.
૫. અભ્યાસક્રમને લગતાં પુસ્તકો, જર્નલ્સ, કૉમ્પ્યુટર્સ, ઓવરહેડ પ્રોજેક્ટર, વી.સી.આર., ટી.વી. તથા શૈક્ષણિક કેસેટ જેવાં સાધનો વસાવવામાં આવે. પુસ્તકો-જર્નલ્સ માટે રૂ. ૫૦,૦૦૦નો આવર્તક ખર્ચ કરવાનો રહેશે. કૉમ્પ્યુટરની સગવડના સંદર્ભમાં સંસ્થા પાસે ૨૦ મોનિટર્સ, પ્રિન્ટર સહિત ઉપલબ્ધ હોવાં જોઈએ.
૬. સંસ્થાના મકાનમાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ ભૌતિક સુવિધાઓની જોગવાઈ કરવામાં આવે.
૭. પ્રેક્ટિકલ સ્ટડીઝ માટે જુદા જુદા સારા ઔદ્યોગિક એકમો, મોટા વ્યાપારી એકમો, સહકારી એકમો વગેરેનો સંપર્ક સાધી વ્યવસ્થા ગોઠવવાની જવાબદારી સંસ્થાએ અદા કરવાની રહેશે અને તેની યાદી યુનિવર્સિટીને મોકલવાની રહેશે.
૮. અભ્યાસક્રમના શિક્ષણનું માધ્યમ અંગ્રેજી રાખવામાં આવે.
૯. આ અભ્યાસક્રમ ગ્રાન્ટ સિવાયનો હોઈ જે કોઈ ખર્ચ કરવો પડે તે ખર્ચની બાંયધરી સંસ્થાએ આપવાની રહેશે.
૧૦. યુનિવર્સિટી સૂચવે તે રીતે પેન્શન, પ્રોવિડન્ટ ફંડ તથા ગ્રેચ્યુઈટી માટે જોગવાઈ કરવાની રહેશે.

વિશેષ નોંધ.—બી.બી.એ.ના અભ્યાસક્રમ માટે નીચે પ્રમાણે લઘુતમ વ્યવસ્થા કરવાની રહેશે :

શૈક્ષણિક સ્ટાફ (ત્રણ વર્ષ માટે)

ક્રમ	જગ્યા	રકમ
૧. ડાયરેક્ટર	૧	લઘુતમ કુલ વેતન-માનદ વેતન દર માસે રૂ. દસ હજાર
૨. લેક્ચરર	પ્રથમ વર્ષે ૨ બીજા વર્ષે કુલ ૩ (૨+૧) ત્રીજા વર્ષે કુલ ૪ (૩+૧)	લઘુતમ વેતન-માનદ વેતન દર માસે રૂ. ૭,૫૦૦
૩ વિઝિટિંગ ફેકલ્ટી		રૂ. ૧૫૦ (વ્યાખ્યાન, સેશનદીઠ)
૪ ટી.એ., ડી.એ. વિઝિટિંગ ફેકલ્ટી		નિયમ પ્રમાણે

૧૧. સંસ્થાએ એ.આઈ.સી.ટી.ઈ.ના રીજિયોનલ ઑફિસર અને ટ્રસ્ટના સંયુક્ત નામે મૂકેલ રૂ. વીસ લાખની ડિપોઝિટ યુનિવર્સિટીની પૂર્વમંજૂરી વગર ઉપાડી શકાશે નહીં

બેચલર ઑફ બિઝનેસ એડમિનિસ્ટ્રેશનના પ્રથમ વર્ષમાં પ્રવેશ આપવાના નિયમો

૧. **પ્રવેશપાત્રતા બાબત :**

બી.બી.એ.ના પ્રથમ વર્ષમાં પ્રવેશ માટે ગુજરાત માધ્યમિક શિક્ષણ બોર્ડ દ્વારા લેવાયેલ ધોરણ ૧૨ની પરીક્ષા સામાન્ય કે વિજ્ઞાન પ્રવાહમાં (૧) અંગ્રેજી અને (૨) મેથેમેટિક્સ અથવા સ્ટેટિસ્ટિક્સ અથવા એકાઉન્ટન્સી (બુકકીપિંગ અને એકાઉન્ટ્સ) વિષયો સાથે દ્વિતીય વર્ગમાં (બિનઅનામત ઉમેદવાર માટે) તથા અનુસૂચિત જાતિ અને અનુસૂચિત જનજાતિના ઉમેદવારો માટે ૪૦ ટકા ગુણ સાથે પ્રથમ પ્રયત્ને પાસ કરેલ હોવી જોઈએ (વિજ્ઞાન પ્રવાહના વિદ્યાર્થીઓના પ્રેક્ટિકલના ગુણ ગણતરીમાં લેવાશે નહીં).

૨. બી.બી.એ.નાં વર્ગમાં મહત્તમ ૭૫ (પંચોતેર) (ડિવિઝનદીઠ) વિદ્યાર્થીઓને પ્રવેશ આપી શકાશે તેમ જ વિદ્યાર્થીદીઠ વાર્ષિક ટ્યુશન ફી રૂ. દસ હજાર નિયત કરવામાં આવે છે. કલમ ૪(૨)માં જણાવેલ ડાયરેક્ટરશ્રીની બેઠકો પર એન.આર.આઈ. અને એન.આર.આઈ. સ્પોન્સર્સ વિદ્યાર્થીઓની ફી ૩,૦૦૦ ડોલર અથવા તેની સમકક્ષ થનાર રકમ જેટલી રાખવાની રહેશે.

૩. **પ્રવેશ માટે બેઠકોની ફાળવણી :** પ્રવેશ માટે બેઠકોની ફાળવણી કરવા સારુ સામાન્ય પ્રવાહ અને વિજ્ઞાન પ્રવાહના બી.બી.એ.ના પ્રવેશ માટે પાત્રતા ધરાવતા વિદ્યાર્થીઓની પ્રવેશ અરજીઓની યાદી તૈયાર કરી જે તે પ્રવાહમાં મળેલ અરજીઓના પ્રોરેટા પ્રમાણે બેઠકોની સામાન્ય પ્રવાહ અને વિજ્ઞાન પ્રવાહમાં ફાળવણી કરવી અને જે તે પ્રવાહની પ્રવેશ યાદીમાંથી પ્રોરેટા પ્રમાણે ફાળવેલ બેઠકોના પ્રમાણમાં મેરિટના ધોરણે પ્રવેશ યાદી તૈયાર કરવી.

૪. **અનામત બેઠકોની ફાળવણી :** અનામત બેઠકોની ફાળવણી રાજ્ય સરકારના વખતોવખતના નિયમો અનુસાર અનામત રાખી કરવાની રહેશે.

૧. સંસ્થાની કુલ પ્રવેશ બેઠકોમાંથી નીચે પ્રમાણે અનામત બેઠકો ફાળવવાની રહેશે :

(અ) અનુસૂચિત જાતિ માટે ... ૭ ટકા
(બ) અનુસૂચિત જનજાતિ માટે ... ૧૩ ટકા
(ક) બક્ષીપંચની જાતિ માટે ... ૨૭ ટકા

૨. ઉપર (૧) ઉપરાંત સંસ્થાની કુલ પ્રવેશ બેઠકો પૈકી વધુમાં વધુ ૧૦ ટકા બેઠકો ડાયરેક્ટરશ્રી પોતાના સ્વવિવેક અનુસાર ભરી શકે તે માટે અધિકાર રહેશે, જે પૈકી ૧ ટકો સીટ સાંસ્કૃતિક રમતગમત ક્ષેત્રે સિદ્ધિઓવાળા તેમ જ વિશિષ્ટ સંજોગો ધરાવતા ઉમેદવારો વડે ભરી શકાશે. આ બેઠકો પાત્રતા ધરાવતા વિદ્યાર્થીઓની યાદીના અરજદારો પૈકીથી જ ભરી શકાશે આ પૈકી કોઈ બેઠક ખાલી રહેતી હોય તે ખુલ્લી બેઠક તરીકે ભરી શકાશે.

નોંધ.— યુનિ. પત્રાંક ૮૦૦૪૮-૫૦, તા. ૨૭-૬-'૯૭થી ડાયરેક્ટરશ્રીની બેઠકો ૧૦ ટકા કરવામાં આવી.

૩. પ્રવેશ યાદીમાંથી પ્રથમ બિનઅનામત બેઠકો ગુણાનુક્રમ પ્રમાણે ભરવાની રહેશે, તેમાં જો અનામત પ્રવેશાર્થીઓનો સમાવેશ થતો હશે તો તેમાં પ્રવેશાર્થીઓનો પ્રવેશ અનામત બેઠક પર ગણાશે નહીં.

૪. ઉપર (૨) મુજબ બિનઅનામત બેઠકો પર પ્રવેશ અપાઈ જાય બાદ બાકી રહેલી ગુણાનુક્રમ યાદીમાંથી ગુણાનુક્રમે જે તે અનામત કક્ષાના પ્રવેશાર્થીઓને તેમની અનામત બેઠકોની સંખ્યાની મર્યાદામાં પ્રવેશ અપાશે.

૫. અનુસૂચિત જાતિ અને અનુસૂચિત જનજાતિ માટેની અનામત બેઠકો સિવાયની બેઠકો માટે પ્રવેશાર્થી ગુણાનુક્રમ યાદી પર બાકી રહેતો હોય અને કોઈ બેઠક ખાલી ન રહેતી હોય તો યુનિવર્સિટીની પૂર્વમંજૂરી મેળવ્યા બાદ અને બેઠક વડે ગુણાનુક્રમ યાદીમાંના બિનઅનામત પ્રવેશાર્થીઓ વડે ગુણાનુક્રમ [illegible] ભરવામાં આવશે. અનુસૂચિત જનજાતિ માટે અનામત રાખેલી [illegible]

રહેલી જગ્યાઓ બિનઅનામતથી ભરી શકાશે. અનુસૂચિત જાતિ માટેની બેઠકો પૂરેપૂરી ન ભરાય તો ખાલી રહેલી જગ્યાઓ બિનઅનામતથી ભરી શકાશે.

૫ **ગુણાનુક્રમ પ્રવેશ યાદી બનાવવા અંગે :**

૧. પ્રવેશ માટે નિયત સમયમર્યાદામાં આવેલ તમામ નિયમ અનુસારી અરજીઓના આધારે એક સળંગ ગુણાનુક્રમ યાદી બનાવવાની ફરજિયાત રહેશે.

૨. પ્રાયોગિક પરીક્ષાના ગુણ સિવાયના ગુણને ધ્યાનમાં લઈ વિજ્ઞાન પ્રવાહના વિદ્યાર્થીઓની ગુણાનુક્રમ યાદી તૈયાર કરવી.

૬. **પ્રવેશ આપવાની પ્રવિધિ બાબત :**

૧. સંસ્થામાં પ્રવેશ આપવાનો અધિકાર ફક્ત ડાયરેક્ટરશ્રીને જ છે અને ડાયરેક્ટરશ્રીની સહી-સિક્કાથી અપાયેલ પ્રવેશ અધિકૃત ગણાશે.

૨. પ્રવેશ આપવાની પ્રક્રિયા શરૂ કર્યા પહેલાં પ્રવેશના નિયમો નોટિસબોર્ડ ઉપર મૂકવાના રહેશે.

૩. પ્રવેશ અંગેના નિયમોનું ઉલ્લંઘન કરીને પ્રવેશ અપાયો હશે, તો તે અંગેની કાયદાકીય તેમ જ યુનિવર્સિટી સંબંધિત સઘળી જવાબદારી ડાયરેક્ટરશ્રીની રહેશે.

૪. પ્રવેશ સંબંધી કોઈ વિવાદ હશે, તો તે અંગે કુલપતિશ્રીનો નિર્ણય આખરી ગણાશે અને સૌને બંધનકર્તા રહેશે.

૫. આ નિયમો બીજા કોઈ હુકમો ન થાય ત્યાં સુધી અમલમાં રહેશે.

શરતો : પાર્ટ-૨ .

બી.બી.એ. પ્રવેશ અંગેની શરતો અને સ્પષ્ટતાઓ

૧. બી.બી.એ.ના અભ્યાસક્રમ માટે ફીનું ધોરણ વિદ્યાર્થીદીઠ મહત્તમ વાર્ષિક ટ્યુશન ફી રૂ. દસ હજાર નિયત કરવામાં આવે છે. યુનિવર્સિટીએ નિયત કરેલ ફીનું ધોરણ મહત્તમ મર્યાદામાં છે, તેથી વિશેષ ફી વસૂલ કરી શકાશે નહીં.

૨. ઉપર નિયત કરેલ ફીમાં તમામ પ્રકારના તાલીમવિષયક ખર્ચનો સમાવેશ થાય છે.

૩. [illegible] કામ માટે કે નિદર્શન માટે અન્યત્ર જવાનું થાય ત્યારે તે અંગેનું ખર્ચ વિદ્યાર્થી ભોગવશે.

૪. ઉપર [illegible] ધોરણોની સમીક્ષા સામાન્ય રીતે ૩ વર્ષ બાદ હાથ ધરવામાં આવશે.

૫. નિમણૂક પામેલ શૈક્ષણિક સ્ટાફ/બિનશૈક્ષણિક સ્ટાફને દર માસે ચૂકવવાની રકમ (પગાર-ભથ્થાંપેટે) બૅન્ક મારફત ચૂકવવાની રહેશે.

૬. [illegible] ધોરણો ક્યાં સુધી ચાલુ રહેશે કે કેમ તેની સમીક્ષા ખાસ સમિતિ સામાન્ય રીતે [illegible] જો ચાલુ રહેવાની સંભાવના લાગશે તો ડાયરેક્ટર સહિતનો શૈક્ષણિક સ્ટાફ મુદતી સેવાને બદલે નિયમિત સેવાને ધોરણે રાખવાનો રહેશે.

૭. લાયક અરજદારોની અરજીઓને સાયન્સ અને કૉમર્સ વગેરે પ્રમાણે વહેંચી પ્રોરેટા પ્રમાણે પ્રવેશ આપવાનો રહેશે.'

સોમલલિત એજ્યુકેશન એન્ડ રિસર્ચ ફાઉન્ડેશન દ્વારા બી.બી.એ.નો અભ્યાસક્રમ શરૂ કરવા અંગે તપાસસમિતિનો હેવાલ

બી.બી.એ.નો ત્રણ વર્ષનો અભ્યાસક્રમ શૈક્ષણિક વર્ષ ૧૯૯૭-૯૮થી શરૂ કરવા માટે સોમ લલિત એજ્યુકેશન એન્ડ રિસર્ચ ફાઉન્ડેશન, અમદાવાદની આવેલ અરજીના અનુસંધાનમાં ગુજરાત યુનિવર્સિટીએ નિયુક્ત કરેલ નીડ-તપાસસમિતિના સભ્યો તરીકે અમે તા. ૨૪-૬-૧૯૯૭ના રોજ સ્થળ પર રૂબરૂ મુલાકાત લીધી હતી. સોમ લલિત ઇન્સ્ટિટ્યૂટ ઑફ મૅનેજમેન્ટ સ્ટડીઝના ડાયરેક્ટર શ્રી એન. આર. દીક્ષિત તેમ જ ફાઉન્ડેશનના મૅનેજિંગ ટ્રસ્ટી શ્રી પ્રજ્ઞેશભાઈ શાસ્ત્રીએ હાજર રહી જરૂરી સઘળી માહિતી પૂરી પાડી હતી. આ અભ્યાસક્રમ શરૂ કરવા/ચલાવવા માટે આ સંસ્થા પાસે નીચેની ભૌતિક સગવડો હાલ ઉપલબ્ધ છે :

(૧) હાલમાં આ અભ્યાસક્રમ એલ. જે. કૉલેજ ઑફ કૉમર્સ, વસ્ત્રાપુર, અમદાવાદના મકાનમાં બપોરના સમયમાં શરૂ કરવામાં આવશે. કૉલેજનું વિશાળ મકાન છે અને બપોરના સમયે જ્યારે આ અભ્યાસક્રમો ચલાવવાના છે ત્યારે તે પૂરેપૂરું આ અભ્યાસક્રમ માટે ઉપલબ્ધ છે. એલ. જે. કૉલેજના મૅનેજિંગ ટ્રસ્ટી પ્રિ. બી. એમ. પિરઝાદાને પણ સમિતિ રૂબરૂમાં મળી હતી. આમ વર્ગખંડો, કાર્યાલય, ગ્રંથાલય તથા અન્ય જરૂરિયાતો માટેના ખંડો પર્યાપ્ત રીતે ઉપલબ્ધ છે. ભવિષ્યમાં સંસ્થાએ પોતાનું આ અભ્યાસક્રમો માટે અલગ મકાન બનાવવાનું આયોજન કરેલ છે.

(૨) ફાઉન્ડેશન દ્વારા ચલાવવામાં આવતા ઇન્સ્ટિટ્યૂટ ઑફ મૅનેજમેન્ટ સ્ટડીઝ માટેના ગ્રંથાલયની ખૂબ સારી સગવડ તો છે જ, પરંતુ સંસ્થાએ વધારામાં ગ્રંથાલય અંગે જે કંઈ વધારાનો ખર્ચ કરવો પડે તે અંગે ગુજરાત યુનિવર્સિટીની શરત અનુસાર જરૂરી ખર્ચ કરવાની તૈયારી ફાઉન્ડેશનના મૅનેજિંગ ટ્રસ્ટીએ દર્શાવી છે.

(૩) સંસ્થામાં ૨૧ કૉમ્પ્યુટર્સની-લેસર પ્રિન્ટર મલ્ટી મીડિયા અને ઇન્ટરનેટની સુવિધા સહિતની-સગવડ કૉમ્પ્યુટર સેન્ટરમાં ઉપલબ્ધ છે. જરૂર પડ્યે વધારાનો ખર્ચ કરવાની પણ સંસ્થાએ તૈયારી બતાવી છે.

અમે આ સાથે જોડેલ શરતોને આધિન આ સંસ્થાને બી.બી.એ.ના અભ્યાસક્રમો ચલાવવા માટેનું જોડાણ હાલ પૂરતું એક વર્ષ માટે પ્રથમ વર્ષ બી.બી.એ. (F.Y.B.B.A.) (બે ડિવિઝન) (શૈક્ષણિક વર્ષ ૧૯૯૭-૯૮ માટે) આપવા ભલામણ કરીએ છીએ.

સહી

ડી. એમ. પેસ્તનજી

વાય. કે. અગ્રવાલ

આર. એમ. વ્યાસ

એકેડેમિક કાઉન્સિલની ભલામણ

'આથી ઠરાવવામાં આવે છે કે સોમ લલિત એજ્યુકેશન એન્ડ રિસર્ચ ફાઉન્ડેશન, અમદાવાદ, નિમણૂકો અંગેની શરત સહિતની નીચે જણાવેલ શરતોનું પાલન એક્ઝિક્યુટિવ કાઉન્સિલને સંતોષ થાય તે રીતે તા. ૧૫-૭-૧૯૯૭ સુધીમાં કરે તો તેને બી.બી.એ.ના અભ્યાસક્રમો શીખવવા માટે તા. ૧૫-૬-૧૯૯૭થી તા. ૧૪-૬-૧૯૯૮ સુધીનું જોડાણ આપવા માટે એક્ઝિક્યુટિવ કાઉન્સિલને ભલામણ કરવી :

શરતો : પાર્ટ ૧ :

બી.બી.એ.ના જોડાણની શરતો

૧. સંસ્થા સ્વતંત્ર એકમ તરીકે રહેશે (કોઈ કૉલેજના ભાગ કે વિભાગ તરીકે નહીં) તેમજ પૂરા સમયની —બપોરની રહેશે.

૨. કાર્યભાર મુજબ યુનિવર્સિટીએ નિયત કરેલ લાયકાત ધરાવતા શિક્ષકોની નિમણૂક કરવામાં આવે.

૩. લાયકાત ધરાવતા ડાયરેક્ટરની નિમણૂક કરવામાં આવે.

૪. જરૂર મુજબ બિનશૈક્ષણિક સ્ટાફની નિમણૂક કરવામાં આવે.

૫. અભ્યાસક્રમને લગતાં પુસ્તકો, જર્નલ્સ, કૉમ્પ્યુટર્સ, ઓવરહેડ પ્રોજેક્ટર, વી.સી.આર., ટી.વી. તથા શૈક્ષણિક કેસેટ જેવાં સાધનો વસાવવામાં આવે. પુસ્તકો-જર્નલ્સ માટે રૂ. ૫૦,૦૦૦નો આવર્તક ખર્ચ કરવાનો રહેશે. કૉમ્પ્યુટરની સગવડના સંદર્ભમાં સંસ્થા પાસે ૨૦ મોનિટર્સ, પ્રિન્ટર સહિત ઉપલબ્ધ હોવાં જોઈએ.

૬. સંસ્થાના મકાનમાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ ભૌતિક સુવિધાઓની જોગવાઈ કરવામાં આવે.

૭. પ્રૅક્ટિકલ સ્ટડીઝ માટે જુદા જુદા સારા ઔદ્યોગિક એકમો, મોટા વ્યાપારી એકમો, સહકારી એકમો વગેરેનો સંપર્ક સાધી વ્યવસ્થા ગોઠવવાની જવાબદારી સંસ્થાએ અદા કરવાની રહેશે અને તેની યાદી યુનિવર્સિટીને મોકલવાની રહેશે.

૮. અભ્યાસક્રમના શિક્ષણનું માધ્યમ અંગ્રેજી રાખવામાં આવે.

૯. આ અભ્યાસક્રમ ગ્રાન્ટ સિવાયનો હોઈ જે કોઈ ખર્ચ કરવો પડે તે ખર્ચની બાંયધરી સંસ્થાએ આપવાની રહેશે.

૧૦. યુનિવર્સિટી સૂચવે તે રીતે પેન્શન, પ્રોવિડન્ટ ફંડ તથા ગ્રેચ્યુઈટી માટે જોગવાઈ કરવાની રહેશે.

વિશેષ નોંધ.—બી.બી.એ.ના અભ્યાસક્રમ માટે નીચે પ્રમાણે લઘુતમ વ્યવસ્થા કરવાની રહેશે :

શૈક્ષણિક સ્ટાફ (ત્રણ વર્ષ માટે)

ક્રમ	જગ્યા	રકમ
૧. ડાયરેક્ટર	૧	લઘુતમ કુલ વેતન-માનદ વેતન દર માસે રૂ. દસ હજાર
૨. લેક્ચરર	પ્રથમ વર્ષે ૨ બીજા વર્ષે કુલ ૩ (૨+૧) ત્રીજા વર્ષે કુલ ૪ (૩+૧)	લઘુતમ વેતન-માનદ વેતન દર માસે રૂ. ૭,૫૦૦
૩ વિઝિટિંગ ફેકલ્ટી		રૂ. ૧૫૦ (વ્યાખ્યાન, સેશનદીઠ)
૪ ટી.એ., ડી.એ. વિઝિટિંગ ફેકલ્ટી		નિયમ પ્રમાણે

૧૧. સંસ્થાએ એ.આઈ.સી.ટી.ઈ.ના રીજિયોનલ ઑફિસર અને ટ્રસ્ટના સંયુક્ત નામે મૂકેલ રૂ. વીસ લાખની ડિપૉઝિટ યુનિવર્સિટીની પૂર્વમંજૂરી વગર ઉપાડી શકાશે નહીં.

બેચલર [illegible] બિઝનેસ એડમિનિસ્ટ્રેશનના પ્રથમ વર્ષમાં પ્રવેશ આપવાના નિયમો

૧. પ્રવેશપાત્રતા ધોરણ :

બી.બી.એ.ના પ્રથમ વર્ષમાં પ્રવેશ માટે ગુજરાત માધ્યમિક શિક્ષણ બોર્ડ દ્વારા લેવાયેલ ધોરણ ૧૨ની પરીક્ષા સામાન્ય કે વિજ્ઞાન પ્રવાહમાં (૧) અંગ્રેજી અને (૨) મેથેમેટિક્સ અથવા સ્ટેટીસ્ટિક્સ અથવા એકાઉન્ટન્સી (બુકકીપિંગ અને એકાઉન્ટ્સ) વિષયો સાથે દ્વિતીય વર્ગમાં (બિનઅનામત ઉમેદવાર માટે) તથા અનુસૂચિત જાતિ અને અનુસૂચિત જનજાતિના ઉમેદવારો માટે ૪૦ ટકા ગુણ સાથે પ્રથમ પ્રયત્ને પાસ કરેલ [illegible] જોઈએ. [illegible] પ્રવાહના વિદ્યાર્થીઓના પ્રેક્ટિકલના ગુણ ગણતરીમાં લેવાશે નહીં.

૨. બી.બી.એ.ના વર્ગમાં મહત્તમ ૭૫ (પંચોતેર) (ડિવિઝનદીઠ) વિદ્યાર્થીઓને પ્રવેશ આપી શકાશે તેમ જ [illegible] કલમ ૪(૨)માં જણાવેલ વિદ્યાર્થીદીઠ વાર્ષિક ટ્યુશન ફી રૂ. દસ હજાર નિયત કરવામાં આવે છે. [illegible] બેઠકો પર એન.આર.આઈ. અને એન.આર.આઈ. સ્પોન્સર્સ વિદ્યાર્થીઓની ફી [illegible] ડોલર [illegible] રકમ જેટલી રાખવાની રહેશે.

૩. પ્રવેશ માટે બેઠકોની ફાળવણી : પ્રવેશ માટે બેઠકોની ફાળવણી કરવા સારુ સામાન્ય પ્રવાહ અને વિજ્ઞાન [illegible] પ્રવેશ માટે પાત્રતા ધરાવતા વિદ્યાર્થીઓની પ્રવેશ અરજીઓની યાદી તૈયાર કરી જે [illegible] પ્રમાણે બેઠકોની સામાન્ય પ્રવાહ અને વિજ્ઞાન પ્રવાહમાં ફાળવણી [illegible] પ્રવેશ યાદીમાંથી પ્રોરેટા પ્રમાણે ફાળવેલ બેઠકોના પ્રમાણમાં મેરિટના ધોરણે પ્રવેશ [illegible].

૪. અનામત બેઠકોની ફાળવણી : અનામત બેઠકોની ફાળવણી રાજ્ય સરકારના વખતોવખતના નિયમો અનુસાર [illegible].

(૧) પ્રવેશ બેઠકોમાં નીચે મુજબ અનામત બેઠકો ફાળવવાની રહેશે :

[illegible] માટે	... ૭ ટકા
[illegible] માટે	... ૧૩ ટકા
[illegible] માટે	... ૨૭ ટકા

(૨) [illegible] કુલ પ્રવેશ બેઠક પૈકી વધુમાં વધુ ૧૦ ટકા બેઠકો ડાયરેક્ટરશ્રી પોતાના [illegible] માટે અધિકાર રહેશે, જે પૈકી [illegible] ટકા સીટ [illegible] [illegible].

[illegible] ક્રમાંક ૮૦૦૪૮ [illegible], તા. ૨૭-૬-૧૯૯૭થી ડાયરેક્ટરશ્રીની બેઠકો ૧૦ ટકા કરવામાં આવી.

૫. પ્રવેશ યાદીમાંથી પ્રથમ બિનઅનામત બેઠકો ગુણાનુક્રમ પ્રમાણે ભરવાની રહેશે, તેમાં જો અનામત [illegible] પ્રવેશ થતા હશે તો તેમના પ્રવેશાર્થીઓના પ્રવેશ અનામત બેઠક પર ગણાશે નહીં.

૬. [illegible] મુજબ બિનઅનામત બેઠકો પર પ્રવેશ અપાઈ જાય બાદ બાકી રહેલી ગુણાનુક્રમ યાદીમાંથી [illegible] અનામત કક્ષાના પ્રવેશાર્થીઓને તેમની અનામત બેઠકોની સંખ્યાની મર્યાદામાં પ્રવેશ અપાશે.

૭. [illegible] જાતિ અને અનુસૂચિત જનજાતિ માટેની અનામત બેઠકો સિવાયની બેઠકો માટે પ્રવેશાર્થી [illegible] યાદી પર બાકી રહેતાં હોય અને કોઈ બેઠક ખાલી ન રહેતી હોય તો યુનિવર્સિટીની [illegible] ગુણાનુક્રમ યાદીમાંના બિનઅનામત પ્રવેશાર્થીઓ વડે ગુણાનુક્રમ [illegible] અનુસૂચિત [illegible] માટે અનામત રાખેલી જગ્યાઓ પુરેપુરી ન ભરાય તો બાકી [illegible] ભરી શકાશે. અનુસૂચિત જાતિ માટેની બેઠકો પુરેપુરી ન ભરાય તો [illegible] ભરી શકાશે.

૮. ગુણાનુક્રમ પ્રવેશ યાદી બનાવવા અંગે :

(૧) [illegible] માટે નિયત [illegible] તમામ નિયમ અનુસારની અરજીઓના આધાર [illegible] ગુણાનુક્રમ યાદી બનાવવાની કાર્યવાહી રહેશે.

(૨) [illegible] પરીક્ષાના [illegible] સામાન્ય પ્રવાહ અને વિજ્ઞાન પ્રવાહના વિદ્યાર્થીઓની ગુણાનુક્રમ યાદી [illegible] કરવી.

૯. પ્રવેશ આપવાની પ્રક્રિયા બાબત :

૧. [illegible] પ્રવેશ આપવાનો અધિકાર ફક્ત ડાયરેક્ટરશ્રીને જ છે અને ડાયરેક્ટરશ્રીના સહી સિક્કાથી [illegible] પ્રવેશ [illegible].

૨. [illegible] શરૂ કર્યા પહેલાં પ્રવેશના નિયમો નોટિસબોર્ડ ઉપર મૂકવાના રહેશે.

૩. [illegible] નિયમોનું [illegible] કરીને પ્રવેશ અપાયાં હશે, તો તે અંગેની કાયદાકીય તેમ જ યુનિવર્સિટી સંબંધિત [illegible] જવાબદારી ડાયરેક્ટરશ્રીની રહેશે.

૪. પ્રવેશ સંબંધી કોઈ વિવાદ હશે, તો તે અંગે કુલપતિશ્રીનો નિર્ણય આખરી ગણાશે અને સૌને બંધનકર્તા રહેશે.

૫. આ નિયમો બીજા કોઈ હુકમો ન થાય ત્યાં સુધી અમલમાં રહેશે.

શરતો : પાર્ટ ૨ :

બી.બી.એ. પ્રવેશ અંગેની શરતો અને સ્પષ્ટતાઓ

૧. બી.બી.એ.ના અભ્યાસક્રમ માટે ફીનું ધોરણ વિદ્યાર્થીદીઠ મહત્તમ વાર્ષિક ટ્યુશન ફી રૂ. દસ હજાર નિયત કરવામાં આવે છે યુનિવર્સિટીએ નિયત કરેલ ફીનું ધોરણ મહત્તમ મર્યાદામાં છે, તેથી વિશેષ ફી વસુલ કરી શકાશે નહીં.

૨. ઉપર નિર્દિષ્ટ કરેલ ફીમાં તમામ પ્રકારના તાલીમ વિષયક ખર્ચનો સમાવેશ થાય છે.

૩. પ્રત્યક્ષ તાલીમ માટે કે નિદર્શન માટે અન્યત્ર જવાનું થાય ત્યારે તે અંગેનું ખર્ચ વિદ્યાર્થી ભોગવશે.

૪. સદર ફીનાં ધોરણોની સમીક્ષા સામાન્ય રીતે ૩ વર્ષ બાદ હાથ ધરવામાં આવશે.

૫. નિમવામાં આવેલ શૈક્ષણિક સ્ટાફ/બિનશૈક્ષણિક સ્ટાફને દર માસે ચૂકવવાની રકમ (પગાર-ભથ્થાંપેટે) બેંક મારફતે ચૂકવવાની રહેશે.

૬. આ અભ્યાસક્રમ સ્વનિર્ભર ધોરણે લાંબો સમય ચાલુ રહેશે કે કેમ તેની સમીક્ષા ખાસ સમિતિ સામાન્ય રીતે ચોથા વર્ષે કરશે અને જો ચાલુ રહેવાની સંભાવના લાગશે તો ડાયરેક્ટર સહિતનો શૈક્ષણિક સ્ટાફ મુદતી સેવાને બદલે નિયમિત સેવાને ધોરણે રાખવાનો રહેશે.

૭. [illegible] અરજદારોની અરજીઓને સાયન્સ અને કોમર્સ વગેરે પ્રમાણે વહેંચી પાડેલા પ્રમાણે પ્રવેશ આપવાનો રહેશે.'

સરદાર વલ્લભભાઈ એજ્યુકેશન ટ્રસ્ટ દ્વારા બી.બી.એ.નો અભ્યાસક્રમ શરૂ કરવા અંગે તપાસસમિતિનો હેવાલ

બી.બી.એ.નો [illegible] વર્ષનો અભ્યાસક્રમ શૈક્ષણિક વર્ષ ૧૯૯૭-૯૮થી શરૂ કરવા માટે સરદાર વલ્લભભાઈ એજ્યુકેશન ટ્રસ્ટ, અમદાવાદનાં આવેલ અરજીના અનુસંધાનમાં ગુજરાત યુનિવર્સિટીએ નિમેલ [illegible] નીચે તપાસસમિતિના સભ્યો તરીકે અમે તા. ૨૪-૬-૧૯૯૭ના રોજ સ્થળ પર રૂબરૂ મુલાકાત લીધી હતી. સરદાર વલ્લભભાઈ એજ્યુકેશન ટ્રસ્ટના ટ્રસ્ટી શ્રી સિદ્ધાર્થભાઈ પટેલ હાજર રહી જરૂરી સઘળી માહિતી પૂરી પાડી હતી. આ અભ્યાસક્રમ શરૂ કરવા/ચલાવવા માટે આ સંસ્થા પાસે નીચેની ભૌતિક સગવડો હાલ ઉપલબ્ધ છે :

(૧) સંસ્થા પાસે એક પાંચ માળનું વિશાળ મકાન ઉપલબ્ધ છે, જેમાં સંસ્થા પાંચ કૉલેજ [illegible] છે, જેનો [illegible] સવારના/બપોરના/સાંજના સમય [illegible] છે. આથી બપોરના સમયે સંસ્થાએ ચોથા માળ પર [illegible] ઓરડા આ અભ્યાસક્રમ [illegible] ફાળવ[illegible] છે. જરૂરી વર્ગખંડો, કાર્યાલય, ગ્રંથાલય તથા અન્ય [illegible] માટેના ખંડો [illegible] રીતે ઉપલબ્ધ છે. [illegible] આ અભ્યાસક્રમો માટે અલગ મકાન [illegible] આયોજન કરેલ છે.

(૨) સંસ્થામાં કોમર્સ વિદ્યાશાખાની બે કૉલેજો, એક [illegible] કૉલેજ, એક વિનયન અને વાણિજ્ય કૉલેજ [illegible] છે. ગ્રંથાલયમાં [illegible] વ્યવસ્થા છે જેમાં ઉપલબ્ધ પુસ્તકોની સંખ્યા સારી [illegible] આ અભ્યાસક્રમ માટે [illegible] જરૂરી [illegible] ખર્ચ ગુજરાત યુનિવર્સિટીના [illegible] કરવાની તૈયારી [illegible] છે.

(૩) સંસ્થાનું [illegible] કોમ્પ્યુટર સેન્ટર છે, જેના પણ જરૂરી વધારાનો ખર્ચ ગુજરાત યુનિવર્સિટીની શરતો [illegible] બતાવી છે.

[illegible] બી.બી.એ.ના અભ્યાસક્રમો ચલાવવા માટેનું [illegible] પ્રથમ [illegible] (ડિવિઝન) [illegible] વર્ષ ૧૯૯૭-૯૮ માટે [illegible].

સહી
ડૉ. એમ. પેસ્ટનજી
એચ. કે. અગ્રવાલ
આર. એચ. વ્યાસ

[illegible] (ડિવિઝન) બાબત

[illegible] સરદાર વલ્લભભાઈ એજ્યુકેશન [illegible], અમદાવાદની [illegible] માટે [illegible] ૧૯૯૭-૯૮થી તા. [illegible] સુધીનાં [illegible].

[illegible]

[illegible] શરતો

[illegible]

કાર્યભાર મુજબ યુનિવર્સિટીએ નિયત કરેલ લાયકાત ધરાવતા શિક્ષકોની નિમણૂક કરવામાં આવે.

૨. કાર્યભાર મુજબ યુનિવર્સિટીએ નિયત કરેલ લાયકાત ધરાવતા શિક્ષકોની નિમણૂક કરવામાં આવે.
૩. લાયકાત ધરાવતા ડાયરેક્ટરની નિમણૂક કરવામાં આવે.
૪. જરૂર મુજબ બિનશૈક્ષણિક સ્ટાફની નિમણૂક કરવામાં આવે.
૫. અભ્યાસક્રમને લગતાં પુસ્તકો, જર્નલ્સ, કૉમ્પ્યુટર્સ, ઓવરહેડ પ્રોજેક્ટર, વી.સી.આર., ટી.વી. તથા શૈક્ષણિક કેસેટ જેવાં સાધનો વસાવવામાં આવે. પુસ્તકો-જર્નલ્સ માટે રૂ. ૫૦,૦૦૦નો આવર્તક ખર્ચ કરવાનો રહેશે. કૉમ્પ્યુટરની સગવડના સંદર્ભમાં સંસ્થા પાસે ૨૦ મોનિટર્સ, પ્રિન્ટર સહિત ઉપલબ્ધ હોવા જોઈએ.
૬. સંસ્થાના મકાનમાં યુનિવર્સિટીનાં ધારાધોરણ મુજબ ભૌતિક સુવિધાઓની જોગવાઈ કરવામાં આવે.
૭. પ્રૅક્ટિકલ સ્ટડીઝ માટે જુદા જુદા સારા ઔદ્યોગિક એકમો, મોટા વ્યાપારી એકમો, સહકારી એકમો વગેરેનો સંપર્ક સાધી વ્યવસ્થા ગોઠવવાની જવાબદારી સંસ્થાએ અદા કરવાની રહેશે અને તેની યાદી યુનિવર્સિટીને મોકલવાની રહેશે.
૮. અભ્યાસક્રમના શિક્ષણનું માધ્યમ અંગ્રેજી રાખવામાં આવે.
૯. આ અભ્યાસક્રમ ગ્રાન્ટ સિવાયનો હોઈ જે કોઈ ખર્ચ કરવો પડે તે ખર્ચની બાંયધરી સંસ્થાએ આપવાની રહેશે.
૧૦. યુનિવર્સિટી સૂચવે તે રીતે પેન્શન, પ્રૉવિડન્ટ ફંડ તથા ગ્રેચ્યુઈટી માટે જોગવાઈ કરવાની રહેશે.

વિશેષ નોંધ.—બી.બી.એ.ના અભ્યાસક્રમ માટે નીચે પ્રમાણે લઘુતમ વ્યવસ્થા કરવાની રહેશે :

શૈક્ષણિક સ્ટાફ (ત્રણ વર્ષ માટે)

ક્રમ	જગ્યા	રકમ
૧. ડાયરેક્ટર	૧	લઘુતમ કુલ વેતન-માનદ વેતન દર માસે રૂ. દસ હજાર
૨. લેક્ચરર	પ્રથમ વર્ષે ૨ બીજા વર્ષે કુલ ૩ (૨+૧) ત્રીજા વર્ષે કુલ ૪ (૩+૧)	લઘુતમ વેતન-માનદ વેતન દર માસે રૂ. ૭,૫૦૦
૩ વિઝિટિંગ ફેકલ્ટી		રૂ. ૧૫૦ (વ્યાખ્યાન, સેશનદીઠ)
૪ ટી.એ., ડી.એ. વિઝિટિંગ ફેકલ્ટી		નિયમ પ્રમાણે

૧૧. સંસ્થાએ એ.આઈ.સી.ટી.ઈ.ના રીજિયોનલ ઑફિસર અને ટ્રસ્ટના સંયુક્ત નામે મુકેલ રૂ. વીસ લાખની ડિપોઝિટ યુનિવર્સિટીની પૂર્વમંજૂરી વગર ઉપાડી શકાશે નહીં.

બેચલર ઑફ બિઝનેસ એડમિનિસ્ટ્રેશનના પ્રથમ વર્ષમાં પ્રવેશ આપવાના નિયમો

૧. **પ્રવેશપાત્રતા બાબત :**

બી.બી.એ.ના પ્રથમ વર્ષમાં પ્રવેશ માટે ગુજરાત માધ્યમિક શિક્ષણ બોર્ડ દ્વારા લેવાયેલ ધોરણ ૧૨ની પરીક્ષા સામાન્ય કે વિજ્ઞાન પ્રવાહમાં (૧) અંગ્રેજી અને (૨) મૅથેમૅટિક્સ અથવા સ્ટૅટિસ્ટિક્સ અથવા એકાઉન્ટન્સી (બુકકીપિંગ અને એકાઉન્ટ્સ) વિષયો સાથે દ્વિતીય વર્ગમાં (બિનઅનામત ઉમેદવાર માટે) તથા અનુસૂચિત જાતિ અને અનુસૂચિત જનજાતિના ઉમેદવારો માટે ૪૦ ટકા ગુણ સાથે પ્રથમ પ્રયત્ને પાસ કરેલ હોવી જોઈએ (વિજ્ઞાન પ્રવાહના વિદ્યાર્થીઓના પ્રૅક્ટિકલના ગુણ ગણતરીમાં લેવાશે નહીં).

૨. બી.બી.એ.ના વર્ગમાં મહત્તમ ૭૫ (પંચોતેર) (ડિવિઝનદીઠ) વિદ્યાર્થીઓને પ્રવેશ આપી શકાશે તેમજ વિદ્યાર્થીદીઠ વાર્ષિક ટ્યૂશન ફી રૂ. દસ હજાર નિયત કરવામાં આવે છે. કલમ ૪(૨)માં જણાવેલ ડાયરેક્ટરશ્રીની બેઠકો પર એન.આર.આઈ. અને એન.આર.આઈ. સ્પોન્સર્સ વિદ્યાર્થીઓની ફી ૩,૦૦૦ ડોલર અથવા તેની સમકક્ષ થનાર રકમ જેટલી રાખવાની રહેશે.

૩. **પ્રવેશ માટે બેઠકોની ફાળવણી :** પ્રવેશ માટે બેઠકોની ફાળવણી કરવા સારુ સામાન્ય પ્રવાહ અને વિજ્ઞાન પ્રવાહના બી.બી.એ.ના પ્રવેશ માટે પાત્રતા ધરાવતા વિદ્યાર્થીઓની પ્રવેશ અરજીઓની યાદી તૈયાર કરી જે તે પ્રવાહમાં મળેલ અરજીઓના પ્રોરેટા પ્રમાણે બેઠકોની સામાન્ય પ્રવાહ અને વિજ્ઞાન પ્રવાહમાં ફાળવણી કરવી અને જે. તે પ્રવાહની પ્રવેશ યાદીમાંથી પ્રોરેટા પ્રમાણે ફાળવેલ બેઠકોના પ્રમાણમાં મેરિટના ધોરણે પ્રવેશ યાદી તૈયાર કરવી.

૪. **અનામત બેઠકોની ફાળવણી :** અનામત બેઠકોની ફાળવણી રાજ્ય સરકારના વખતોવખતના નિયમો અનુસાર અનામત રાખી કરવાની રહેશે.

૧. સંસ્થાની કુલ પ્રવેશ બેઠકોમાંથી નીચે પ્રમાણે અનામત બેઠકો ફાળવવાની રહેશે :

(અ) અનુસૂચિત જાતિ માટે ... ૭ ટકા
(બ) અનુસૂચિત જનજાતિ માટે ... ૧૩ ટકા
(ક) બક્ષીપંચની જાતિ માટે ... ૨૭ ટકા

૨. ઉપર (૧) ઉપરાંત સંસ્થાની કુલ પ્રવેશ બેઠકો પૈકી વધુમાં વધુ ૧૦ ટકા બેઠકો ડાયરેક્ટરશ્રી પોતાના સ્વવિવેક અનુસાર ભરી શકે તે માટે અધિકાર રહેશે, જે પૈકી ૧ ટકો સીટ સાંસ્કૃતિક રમતગમત ક્ષેત્રે સિદ્ધિઓવાળા તેમ જ વિશિષ્ટ સંજોગો ધરાવતા ઉમેદવારો વડે ભરી શકાશે. આ બેઠકો પાત્રતા ધરાવતા વિદ્યાર્થીઓની યાદીના અરજદારો પૈકીથી જ ભરી શકાશે આ પૈકી કોઈ બેઠક ખાલી રહેતી હોય તે ખુલ્લી બેઠક તરીકે ભરી શકાશે.

નોંધ.— યુનિ. પત્રાંક ૮૦૦૪૮-૫૦, તા. ૨૭-૬-'૯૭થી ડાયરેક્ટરશ્રીની બેઠકો ૧૦ ટકા કરવામાં આવી.

૩. પ્રવેશ યાદીમાંથી પ્રથમ બિનઅનામત બેઠકો ગુણાનુક્રમ પ્રમાણે ભરવાની રહેશે, તેમાં જો અનામત પ્રવેશાર્થીઓનો સમાવેશ થતો હશે તો તેમાં પ્રવેશાર્થીઓનો પ્રવેશ અનામત બેઠક પર ગણાશે નહીં.

૪. ઉપર (૨) મુજબ બિનઅનામત બેઠકો પર પ્રવેશ અપાઈ જાય બાદ બાકી રહેલી ગુણાનુક્રમ યાદીમાંથી ગુણાનુક્રમે જે તે અનામત કક્ષાના પ્રવેશાર્થીઓને તેમની અનામત બેઠકોની સંખ્યાની મર્યાદામાં પ્રવેશ અપાશે.

૫. અનુસૂચિત જાતિ અને અનુસૂચિત જનજાતિ માટેની અનામત બેઠકો સિવાયની બેઠકો માટે પ્રવેશાર્થી ગુણાનુક્રમ યાદી પર બાકી રહેતો હોય અને કોઈ બેઠક ખાલી ન રહેતી હોય તો યુનિવર્સિટીની પૂર્વમંજૂરી મેળવ્યા બાદ અને બેઠક વડે ગુણાનુક્રમ યાદીમાંના બિનઅનામત પ્રવેશાર્થીઓ વડે ગુણાનુક્રમે ભરવામાં આવશે. અનુસૂચિત જનજાતિ માટે અનામત રાખેલી જગ્યાઓ પુરેપૂરી ન ભરાય તો ખાલી રહેલી જગ્યાઓ બિનઅનામતથી ભરી શકાશે. અનુસૂચિત જાતિ માટેની બેઠકો પુરેપૂરી ન ભરાય તો ખાલી રહેલી જગ્યાઓ બિનઅનામતથી ભરી શકાશે.

૫. **ગુણાનુક્રમ પ્રવેશ યાદી બનાવવા અંગે :**

૧. પ્રવેશ માટે નિયત સમયમર્યાદામાં આવેલ તમામ નિયમ અનુસારી અરજીઓના આધારે એક સળંગ ગુણાનુક્રમ યાદી બનાવવાની ફરજિયાત રહેશે.
૨. પ્રાયોગિક પરીક્ષાના ગુણ સિવાયના ગુણને ધ્યાનમાં લઈ વિજ્ઞાન પ્રવાહના વિદ્યાર્થીઓની ગુણાનુક્રમ યાદી તૈયાર કરવી.

૬. **પ્રવેશ આપવાની પ્રવિધિ બાબત :**

૧. સંસ્થામાં પ્રવેશ આપવાનો અધિકાર ફક્ત ડાયરેક્ટરશ્રીને જ છે અને ડાયરેક્ટરશ્રીના સહી-સિક્કાથી અપાયેલ પ્રવેશ અધિકૃત ગણાશે.
૨. પ્રવેશ આપવાની પ્રક્રિયા શરૂ કર્યા પહેલાં પ્રવેશના નિયમો નોટિસબોર્ડ ઉપર મૂકવાના રહેશે.
૩. પ્રવેશ અંગેના નિયમનું ઉલ્લંઘન કરીને પ્રવેશ અપાયો હશે, તો તે અંગેની કાયદાકીય તેમ જ યુનિવર્સિટી સંબંધિત સઘળી જવાબદારી ડાયરેક્ટરશ્રીની રહેશે.
૪. પ્રવેશ સબંધી કોઈ વિવાદ હશે, તો તે અંગે કુલપતિશ્રીનો નિર્ણય આખરી ગણાશે અને સૌને બંધનકર્તા રહેશે.
૫. આ નિયમો બીજા કોઈ હુકમો ન થાય ત્યાં સુધી અમલમાં રહેશે.

શરતો : પાર્ટ ૨ :

બી.બી.એ. પ્રવેશ અંગેની શરતો અને સ્પષ્ટતાઓ

૧. બી.બી.એ.ના અભ્યાસક્રમ માટે [illegible] દરેક વિદ્યાર્થીદીઠ મહત્તમ વાર્ષિક ટ્યૂશન ફી રૂ. દસ હજાર નિયત [illegible] આવે છે યુનિવર્સિટીએ નિયત કરેલ ફીનું ધોરણ મહત્તમ મર્યાદામાં છે, તેવી વિશેષ ફી વસૂલ કરી [illegible] નહીં.
૨. ઉપર નિયત કરેલ ફીમાં તમામ પ્રકારના તાલીમવિષયક ખર્ચનો સમાવેશ થાય છે.
૩. [illegible] તાલીમ [illegible] નિદર્શન માટે અન્યત્ર જવાનું થાય ત્યારે તે અંગેનું ખર્ચ વિદ્યાર્થી [illegible].
૪. [illegible] ફીનાં ધોરણોની સમીક્ષા [illegible] ૩ વર્ષ બાદ હાથ ધરવામાં આવશે
૫. [illegible] આવેલ શૈક્ષણિક સ્ટાફ/બિનશૈક્ષણિક સ્ટાફને દર માસે ચૂકવવાની રકમ [illegible] રકમ ચૂકવવાની રહેશે.
૬. [illegible] અભ્યાસક્રમ સ્વનિર્ભર [illegible] ચાલુ રહેશે કે કેમ તેની સમીક્ષા [illegible] અભ્યાસક્રમ [illegible] કરશે અને જો ચાલુ રહેવાની સંભાવના [illegible] તો ડાયરેક્ટર [illegible] શૈક્ષણિક [illegible] [illegible] બદલ નિયત [illegible] ધોરણો રાખવાના રહેશે [illegible] પ્રમાણે વહેંચી પ્રોરેટા પ્રમાણે પ્રવેશ આપવાનો રહેશે.
૭. [illegible] અરજદારો [illegible] અને કોમર્સ વગેરે [illegible]

પરિશિષ્ટ '૪૦'

કામકાજ ક્રમાંક ૭

O. M.Com. I :

(1) Candidates for the degree of Master of Commerce must have passed the examination for the degree of Bachelor of Commerce of This University or an examination recognised as equivalent thereto

Moreever, candidates who have passed Bachelor of Business Administration B.B.A. Degree of this University or an examination *recognised equivalent thereto will be eligible for admission into O. M.Com. I with Business Management subject only.*

Provided, however, that a candidate who has passed the Bachelor of Arts/Science/ Commerce Degree examination in Pass Class shall offer at the M.A./M.Sc./M.Com. degree examination, the same subject or subjects with which he has Passed the Bachelor Degree Examination.

and

(2) Must have Passed the M.Com. Degree Examination in both Part I and Part II after keeping, as per requirements laid down in that behalf, two terms for each of the parts viz., Part I and Part II Examinations

પરિશિષ્ટ '૪૧'

કામકાજ ક્રમાંક ૮

The following are the minimum qualifications for the post of a Director of the recognised Research Institute of the University.

1(a) Bachelor's and Master's Degree in the Second Class in the subject or subjects related to the research area of the Institute.

OR

(b) Bachelor's and Master's Degree in the subject or subjects related to the research area of the Institute and having Ph.D. degree in the subject.

OR

(c) Master's Degree in the subject or subjects related to the research area of the Institute from a foreign University.

2(a) Must have successfully guided at least two students for the Ph.D. Degree.

OR

(b) Published at least seven Research papers in the subject or subjects related to the research area of the Institute in reputed Journals.

OR

(c) Ph.D. Degree and at least five Research papers in the subject in reputed research journals.

OR

(d) Successfully guided fifteen dissertations at post-graduate level.

3(a) 10 years of teaching experience at a University or a college level, out of which 5 years experience should be at Post-graduate level.

OR

(b) 10 years research experience in the institute of repute out of which at least five years experience should be after completing Ph.D. with a proof thereof

OR

(c) Ph.D. Guide with at least 5 years administrative experience.

The following shall be the minimum qualifications for the post of a Reader in the recognised Research Institute of the University

1(a) Bachelor's and Master's degree at least with Second Class in the subject or subjects related to the research area of the Institute.

OR

(b) Bachelor's and Master's Degree in the subject or subjects related to the research area of the Institute and having Ph.D. degree in the subject or subjects related to the research area of the Institute, or Master's Degree in the subject or subjects related to the research area of the Institute from a foreign University

and

2. Three research papers in the subject or subjects related to the research area of the Institute published in reputed research journal

OR

Successfully guided ten dissertations at Post-graduate level in the subject or subjects related to the research area of the Institute.

3(a) Five years of teaching experience at a University or a college out of which three years experience should be at Post-graduate level

OR

(b) Five years research experience in the institute of repute out of which at least three years experience should be after completing Ph.D. with a proof thereof

પરિશિષ્ટ '૪૨'

કામકાજ ક્રમાંક ૯ (૧)

Dept. of Zoology, School of Sciences, Gujarat University, Ahmedabad-9

Appendix-II

New Syllabus for Post-Graduate Advance Diploma course in Biomedical Technology

(In force from July/Aug., 1997)

Paper I : Instrumentation and Methdology

Paper II : Semenology, Haematology and Clinical Biochemistry

Paper III : Diagnostic Techniques--Radioimmunoassay and Chromo-some analysis.

Paper I--Instrumentation and Methodology

Microscopy, General principles. Light microscopy, Electron microscopy, fluorescence, Phase contrast, Polarized and Confocal microscopy, Histology. Tissue fixation techniques, sectioning, microtome types, and their uses. General staining of Cell and Cell organelles. Cytochemical staining methods-DNA, RNA, Proteins, Lipids, Enzymes. Techniques to study the cell Smear, Squash etc., Centrifugation, Electropgoresis, Spectrophotometry, Autoradiography, Tissue culture, Sterilization technique, Cultivation of pathogens, sensitivity of pathogens, Cryostat, etc. pH meter, Principles of Radiation biology, Ultrasound.

Paper II : Semenology, Haematology and Clinical Biochemistry

Ultrastructure of sperms, Semen biochemistry, Sperm functional tests, Sperm banks, Capacitation, Folliculogenesis, Ovalation, Fertilization, In vitro fertilization, Assisted reproductive technology IVF, GIFT etc., AIDS, Immuno reproduction, haematocrit, Differential count, TC Hb estimation, blood cell abnormalities, Blood groups, blood coagulation, Blood sugar, acetone

-Liver function tests, Urine analysis microscopic qualitative & quantitative

-Kidney function test.

-Heart function test.

Serum parameters, lipid profile, protein, Electrolytes estimation

Enzymes of clinical importance

--Other specialized tests.

Paper III--Diagnostic Techniques--Radiommunoassay and Chromosome Analysis

Principles of immunology,-Radioimmunoassay, Radioreceptor assay, ELISA, Study of endocrine glands, histology, Types, chemical nature, synthesis, metabolism, control and function of different hormones, Mechanism of hormone action, Signal transduction, Receptors, Types, Location, metabolism and recycling, Second massengers, Hormones and Biotechnology, Clinical endocrinology.

Cell nucleus. Nucleic acids : Types, different species, structure, organization, function, synthesis, DNA isolation, sequencing, DNA repair.

Chromosomes : Types of chromosomes, heterochromation, euchromatin, Chromosome structure. Study of sex chromatin and its importance Chromosome banding techniques : G-banding, C-banding, R-banding, q-banding, high resolution banding, study of nucleolar organizer region of chromosome and its importance, Late replicating Banding, Study of sister chromatid exchange. FISH techniques, Flow cytometry. Sex determination and sex linked inheritance. Principles of cytogenetics. Human chromosome and abnormalities. Identification of chromosomes and karyotyping. Prenatal diagnostic techniques, transdermal amniocentesis and chorionic biopsy. Human pedigree analysis. Genetic engineering and recombinant DNA, Southern, Northern and Western blots. PCR RELP analysis, DNA finger printing, Gene therapy and application.

Practicals I to III will be based on theory papers.

પરિશિષ્ટ '૪૩'

કામકાજ ક્રમાંક ૧૦

રાજ્યની માન્યતા પ્રાપ્ત કાયદાની કૉલેજોને અનુદાનપાત્ર ગણવા બાબત

ગુજરાત સરકાર, શિક્ષણ વિભાગ, ઠરાવ ક્રમાંક : એનજીસી-૧૫૯૬-સી.સી-૧૩૧-ખ,

સચિવાલય, ગાંધીનગર, તા. ૫-૯-૧૯૯૭

વંચાણે લીધા :

(૧) શિક્ષણ વિભાગનો તા. ૧૪-૯-૧૯૮૮નો ઠરાવ ક્રમાંક : એમઆઈએસ-૧૧૮૭-૫૫૮૪૩-ખ.

(૨) શિક્ષણ વિભાગનો તા. ૧૬-૬-૧૯૮૯નો ઠરાવ ક્રમાંક : એનજીસી-૧૫૮૪-૧૧૮૯-ખ.

(૩) શિક્ષણ વિભાગનો તા. ૧૫-૧૧-૧૯૮૯નો ઠરાવ ક્રમાંક : એનજીસી-૧૫૮૯-એમ-૧૦૨૬-ખ.

(૪) શિક્ષણ વિભાગનો તા. ૧૨-૭-૧૯૯૦નો ઠરાવ ક્રમાંક : એનજીસી-૧૫૮૪-સીએમ-૧૬૭(૫૦/૮૮)-ખ.

(૫) શિક્ષણ વિભાગનો તા. ૨૨-૭-૧૯૯૨નો ઠરાવ ક્રમાંક : એનજીસી-૧૫૯૨-૧૮૫૬-ખ.

(૬) શિક્ષણ વિભાગનો તા. ૩૦-૬-૧૯૯૪નો ઠરાવ ક્રમાંક : એનજીસી-૧૫૯૨-સીએમ-૪૧૮૩(૯૨)/૮૩/૯૨-ખ.

પ્રસ્તાવના :

રાજ્યમાં આવેલ કાયદાની કૉલેજોને અનુદાનપાત્ર ગણવા ઘણા સમયથી રાજ્ય સરકાર સમક્ષ રજૂઆતો કરવામાં આવેલ, પરંતુ જે તે સમયે પોલ-કમિટીની ભલામણ અનુસાર કાયદાની કૉલેજોને અનુદાનપાત્ર ન ગણવાનું રાજ્ય સરકારે પ્રથમથી જ ઠરાવેલ હતું. ત્યાર બાદ જુદી જુદી સંસ્થાઓ તથા કૉલેજો તરફથી અનુદાનની માગણીઓ પણ રજૂ થયેલ હતી તથા આ કૉલેજના કર્મચારીઓ તરફથી સીધા પગાર હેઠળ આવરી લેવાની માગણી થતાં રાજ્ય સરકારે બિનશૈક્ષણિક કર્મચારીઓને સીધા પગાર હેઠળ આવરી લીધેલ અને જો કાયદાની કૉલેજો ખોટ કરતી હોય તો તેવી ખોટ સરભર કરવા વધુમાં વધુ રૂપિયા ૧૦૦ વિદ્યાર્થીદીઠ દરેક સત્રમાં વાર્ષિક સહાય આપવાનું સરકારે ઠરાવેલ હતું.

રાજ્યની કાયદાની કૉલેજોને અનુદાન મળતું ન હોવાથી અને શ્રી મનુભાઈ પ્રાગજી વશી વિરુદ્ધ મહારાષ્ટ્ર સરકારના કેસમાં સુપ્રિમ કોર્ટના ચુકાદાને ધ્યાને લઈ ગુજરાત રાજ્યના બાર કાઉન્સિલ ઑફ ગુજરાત દ્વારા નામદાર ગુજરાત હાઈકોર્ટમાં સ્પે. સિ.એ. નં. ૧૦૧૪૧/૯૬ દાખલ કરવામાં આવેલ. જે અંગે નામદાર હાઈકોર્ટ તરફથી રાજ્યની અન્ય ફેકલ્ટીની કૉલેજોની જેમ કાયદાની કૉલેજોને ૧૯૯૬-૯૭ના વર્ષથી અનુદાનને પાત્ર ગણવા આદેશ કરેલ. ઉપરોક્ત હુકમ સામે રાજ્ય સરકારે નામદાર સુપ્રિમ કોર્ટમાં અપીલ દાખલ કરેલ. જે નામદાર સુપ્રિમ કોર્ટ દ્વારા તા. ૯-૭-૧૯૯૭ના રોજ રદ કરવામાં આવેલ. નામદાર સુપ્રિમ કોર્ટના ચુકાદાની નકલ તા. ૨૧-૭-૧૯૯૭ના રોજ મળેલ.

ઉપરોક્ત હકીકતે નામદાર ગુજરાત હાઈકોર્ટની સ્પે. સિ.એ. નં. ૧૦૧૪૧/૯૬માં અપાયેલ આદેશ મુજબ રાજ્યની કાયદાની કૉલેજોને ૧૯૯૬-૯૭ના નાણાકીય વર્ષથી અનુદાનપાત્ર ગણવાની રહે છે.

ઠરાવ :

રાજ્યની અન્ય વિનયન, વાણિજ્ય, વિજ્ઞાન કૉલેજોને અનુદાનને પાત્ર ગણવામાં આવેલ છે તે મુજબ રાજ્યની માન્યતા પ્રાપ્ત બિનસરકારી કાયદાની કૉલેજોને પણ ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષથી નીચે દર્શાવેલ શરતોને આધિન અનુદાનપાત્ર ઠરાવવામાં આવે છે

( ) સને ૧૯૯૬-૯૭ના શૈક્ષણિક વર્ષથી રાજ્યની માન્યતા પ્રાપ્ત કાયદાની કૉલેજોને ગ્રાન્ટ ઇન એઈડ હેઠળ સમાવવાની રહેશે.

(ખ) જે સંસ્થા-કૉલેજોએ કાયમી ધોરણે ગ્રાન્ટ ન લેવાની શરતે જોડાણ મેળવેલ છે તેવા કિસ્સાઓ અલગ રીતે વિચારવાના રહેશે.

(ગ) રાજ્યની કાયદાની કૉલેજો કે જે રાજ્ય સરકાર-અન્ય સક્ષમ સત્તાધિકારી કે જેમાં બાર કાઉન્સિલ ઑફ ઇન્ડિયા દ્વારા યોગ્ય રીતે માન્ય થયેલ હોય અને યોગ્ય સત્તાધિકારી અને યુનિવર્સિટી દ્વારા જે ધોરણો નક્કી કરવામાં આવેલ હોય તે પરિપૂર્ણ કરતી હોય તેવી કૉલેજો અનુદાનને પાત્ર રહેશે.

(ઘ) અનુદાનને પાત્ર કાયદાની કૉલેજોએ માન્યતા કે સંલગ્નતા આપનારા તંત્રોએ શિક્ષક, કર્મચારીવર્ગની ભરતી, સેવાની શરતો, પાઠ્યક્રમ, શિક્ષણનો દરજ્જો અને શિસ્ત સંબંધમાં નિયત કરેલ તમામ નિયમો અને નિયમોનું ચુસ્તપણે પાલન કરવાનું રહેશે.

(ચ) રાજ્યની કાયદાની કૉલેજોને ગ્રાન્ટ ઇન એઈડ હેઠળ સમાવવાનો નિર્ણય કરાયેલ હોઈ હવે બિનસરકારી કાયદાની કૉલેજોમાં વિદ્યાર્થીદીઠ જે આર્થિક સહાય આપવાનું ધોરણ વિભાગના તા. ૧૨-૭-૧૯૯૦ના ઠરાવથી કરવામાં આવેલ તે રદ કરવામાં આવે છે.

(૭) બિનસરકારી કાયદાની કૉલેજોના બિનશૈક્ષણિક કર્મચારીઓની સીધા પગારધોરણની યોજનામાં સમાવેશ કરતાં આવી કૉલેજો પાસેથી લેણી નીકળતી રકમને ૧૯૯૬-૯૭ના તથા ત્યાર પછીના વર્ષ માટે મળવાપાત્ર અનુદાનની રકમ સામે સરભર કરવાની રહેશે.

૨. કાયદાના શિક્ષણમાં ઉચ્ચ ગુણવત્તા જળવાઈ રહે તે માટે સંબંધિત યુનિવર્સિટી બાર કાઉન્સિલ ઑફ ઈન્ડિયા, બાર કાઉન્સિલ ઑફ ગુજરાત અને અન્ય સંબંધિત સંસ્થા અને વ્યક્તિઓનું માર્ગદર્શન મળી રહે તે માટે તેમના પ્રતિનિધિઓની એક સલાહકાર સમિતિની રચના કરી તેઓનો હેવાલ અભિપ્રાય મેળવીને કાયદાના ક્ષેત્રમાં ઉચ્ચ પ્રકારનું શિક્ષણ મળી રહે તેવી વ્યવસ્થા કરવાની રહેશે.

૩. રાજ્યની અનુદાનને પાત્ર થતી કાયદાની કૉલેજોને ચૂકવવા માટે ઉચ્ચ શિક્ષણ કમિશનરશ્રી, ગુજરાત રાજ્ય ગાંધીનગરને અધિકૃત કરવામાં આવે છે અને માન્યતાવાળી કાયદાની કૉલેજોને બાકી ચૂકવવાપાત્ર થતી અનુદાનની રકમ તાત્કાલિક ચૂકવવામાં આવે તે મુજબની કાર્યવાહી કરવાની રહેશે.

૫. આ અંગેનો ખર્ચ અંદાજપત્રના સદર “૨૨૦૨-સામાન્ય શિક્ષણ-૦૩-યુનિ. અને ઉચ્ચ શિક્ષણ-૧૦૪-બિનસરકારી કૉલેજો અને સંસ્થાઓને સહાય” ખાતે ઉધારવાનો રહેશે અને તે હેઠળ મંજૂર થયેલ ગ્રાન્ટમાંથી મેળવવાનો રહેશે.

૬. આ ઠરાવથી શિક્ષણ વિભાગની સમાનાંકી ફાઈલ ઉપર નાણા વિભાગની તા. ૨-૮-૧૯૯૭ની નોંધથી મળેલ મંજૂરી અન્વયે બહાર પાડવામાં આવે છે.

ગુજરાતના રાજ્યપાલશ્રીના હુકમથી અને તેમના નામે.

(શ્રીમતી આર. પી. જોષી)
ઉપસચિવ, શિક્ષણ વિભાગ.

પરિશિષ્ટ '૪૪'

કામકાજ ક્રમાંક ૧૧

A meeting of the Faculty of Technology including Engineering is held on 10-9-1997 at 4-... p.m. in the University Office. The presence were as under :

1	Prin. Harshadbhai Motibhai Desai (Dean, Engg. Faculty)	Present
2	Prof. N. V. Vasani, B.E. (M.), M.Tech.	Absent
3	Shri M. C. Chhabaria	Absent
4	Shri Ramanbhai Ramdas Patel	Present
5	Prof. R. N. Shukla	Present
6	Shri K. J. Parmar	Absent
7	Prof. G. N. Gandhi	Present
8	Prof. T. R. Shah	Present

The meeting presided by Shri H. M. Desai, the Dean, of Engineering Faculty.

The following resolutions are made upanimously in the faculty meeting :

(1) The revised syllabus of B.E. Chemical, Rubber and Plastics Semester 3 to 8 is presented by the Board of Studies in Chemical Engineering and have passed by the faculty and recommended to take inforce from September, 1997.

(2) The revised syllabus of Mathematics Paper-II for B.E. Semester III Common for all and separate paper Mathematics Paper III for B.E. Semester IV (EC, IC and Electrical) and B.E. (Civil and Mechanical) is presented and passed by the faculty and recommended to implement from September, 1997 immediately.

(3) The recommendation of the Adhoc Board of Studies for B.E. Information Technology for the subject of IT 105—Application packages and IT 107 Programming Languages is accepted and recommended to be implemented from September, 1997.

(4) The recommendation of the Board of Studies in Civil Engineering for the new syllabus, revised teaching and Examination Scheme of B.E. (Civil) Construction Technology and for Semester III to VIII is accepted and recommended to be implemented from September, 1997.

(5) The recommendation of the revised syllabus of Surveying at B.E. Semester IV (Civil) with effective from September, 1997 is accepted.

H. M. Desai
Dean

પરિશિષ્ટ '૪૫'

કામકાજ ક્રમાંક ૧૨

For B.E. Computer Engineering Students

1. For the students studying in Semester III in the Year 1997-98 all the subjects and modifications are effective from their Semester III from September, 1997.
2. Only for the students studying in Semester V in the Year 1997-98 all the subjects and modifications are effective throughout their B.E. from September, 1997, except

   In Semester VI they have to study Computer Organisation (as per old scheme) instead of Design and Analysis of Algorith (new scheme).
3. Only for the students studying in Semester VII in the year 1997-98.

   They have to study Operating Systems instead of Computer Network in Semester VII from September, 1997.

   All changes are effective for other subjects in Semester, VII and VIII from academic year 1997-98 (September, 1997).

TEACHING AND EXAMINATION SCHEME

B.E. Semester III (Computer Engg.) REVISED *(In force from, sept., 1997)*

Sub. No.	Name of Subject	*Teaching Scheme* Lect.	pract.	Theo. marks	*Examination Scheme* hr	Sess marks	Pr./Oral marks	Term work	Total marks
301	Basic Electronics Engg.	4	2	100	--	—	25	25	150
302	Applied Mathematics-II	4	-	100	--	--	—	—	100
303	Control & Instrumentation	4	2	100	--	—	25	25	150
304	Computer Programming-I (C & Basic)	4	4	100	--	—	25	25	150
305	Business Informa. System	4	2	100	--	--	25	25	150

B.E. Semester IV (Computer Engg.) REVISED

Sub. No.	Name of Subject	*Teaching Scheme* Lect.	pract.	Theo. marks	*Examination Scheme* hr	Sess. marks	Pr./Oral marks	Term work	Total marks
401	Discrete Mathematics	4	-	100	--	—	—	...	100
402	Data Communication	4	2	100	--	—	25	25	150
403	Digital & Logical Design	4	2	100	--	—	25	25	150
404	Computer Architecture	4	2	100	--	—	25	25	150
405	Programming Language-II (O.O.P. & Window)	4	4	100	--	—	25	25	150

B.E. Semester V (Computer Engg.) REVISED

Sub. No.	Name of Subject	*Teaching Scheme* Lect.	pract.	Theo. marks	*Examination Scheme* hr	Sess. marks	Pr./Oral marks	Term work	Total marks
501	Database Manage. System	4	2	100	--	—	25	25	150
502	Data Struct. & Program. Methodology	4	2	100	--	--	25	25	150
503	Microprocessor & Interface	4	2	100	--	—	25	25	150
504	Computer Oriented Numer. Tech.	4	2	100	--	—	25	25	150
505	Computer Peripherals	4	2	100	—	—	25	25	[illegible]

B.E. Semester VI (Computer Engg.) REVISED

Sub No	Name of Subject	Teaching Scheme Lect.	pract.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
601	Systems Programming	2	2	50 (2 hrs.)	--	—	25	25	100
602	Design & Analysis of Algorithm	4	2	100	--	—	25	25	150
603	Operating System	4	2	100	--	—	25	25	150
604	Advanced Microprocessor	4	2	100	--	—	25	25	150
605	Appl. Develop. Tool Lab.	2	4	100	--	—	25	25	150
606	Computer & Society	2	0	50 (2 hrs.)	—	—	—	---	50

B.E. Semester VII (Computer Engg.) REVISED

Sub No	Name of Subject	Teaching Scheme Lect.	pract.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
701	Computer Network	4	2	100	--	—	25	25	150
702	Software Engineering	4	2	100	--	—	25	25	150
703	Elective -I	4	2	100	--	—	25	25	150
704	Elective II	4	2	100	—	—	25	25	150
705	Project	0	6	—	--	—	100	100	200

Elective I
1. Digital Signal Processing
2. Language Processor
3. Formal Language & Automata Theory

Elective II
1. Simulation & Modelling
2. Artifical Intelligence
3. C.F.D.S.

B.E. Semester VIII (Computer Engg.) REVISED

Sub No	Name of Subject	Teaching Scheme Lect.	pract.	Examination Scheme Theo. marks	hr	Sess. marks	Pr./Oral marks	Term work	Total marks
801	Computer Graphics	4	2	100	--	—	25	25	150
802	Elective-III	4	2	100	--	—	25	25	150
803	Elective-IV	4	2	100	--	—	25	25	150
804	Project	--	6	—	--	—	100	100	200
805	Parallel Processing	4	2	100	--	—	25	25	150

Elective III
1. Advanced NW. Tech (JAWA & HTML)
2. Symbolic Logic & Logic Prog.

Elective IV
1. Distributed Systems
2. Image Processing & Pattern Recognition
3. Operation Research.

B.E. Sem.-III (CE)

301. Basic Electronics Engineering

Teaching Scheme Theory	practical	Theory marks	Hrs.	Examination Scheme Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Two port networks charactersucs of two port networks, open circuit parameters, hybrid parameters, transmission parameters, impedance voltage controlled current source, ideal transformer, reciprocity, impedance converter.

Diodes and their applications : Ideal diodes, semiconductors, junction diode, rectifier ircuits, fullwave rectifier, bridge rectifier, filter filter, voltage multiplier, clipping circuits clamping circuits.

Active device asnd curcuits : Junction transistor, Ebers-Moll model and charge control model Transient behaviour, small signal equivalent cirucit-H-Parameter and hybrid-pai basic transistor amplifier, specifications of amplifiers, junction field effect transistor, mosfet

Linear integrated ciruciits : Intregrated circuit technology, dc coupled amplifier, differential amplifier, common mode rejection ratiu operational amplifiers. Negative Feedback Invertor, summer buffer. Threshold Discriminator. Power supply Regulation Zener diode regulation Short circuit protection. Current regulation.

Oscillators . Negative Resistence. LC Oscillators. Crystal Oscillators Phase shieft oscillators. Wien bridge oscillator. Relaxation oscillators. High frequency sinusoidal Oscillators. Controlled oscillators. Phase lock loop and its applications.

Text book/Reference book(s)

1. Electronics for scientists and engineers by T. R. Viswanathan, G. K. Mehta and V Rajaraman.
2. Integrated electronics, analog and digital circuits and systems by J. Millman and Halkias.
3. Microelectronics by J. Millman and A. Grabel

302. Applied Mathematics—II

Teaching Scheme Theory	practical	Theory marks	Hrs.	Examination Scheme Sess marks	Pr. Oral marks	Term work	Total marks
4	—	100	3				100

1. **Fourier Series** : Periodic functions. Dirichlet's conditions, Fourier series. Euler's formulae, Fourier series of even and odd Fourier expansion of periodic functions with period 2π. Fourier series of periodic functions with arbitrary periods. Half range Fourier functions, Fourier series of periodic functions with arbitrary periods. Half range Fourier series, Harmonic analysis.
2. **Laplace Transforms** : Motivation, Definition, Linearity property Laplace transforms of elementary functions. Shifting theorem Inverse Laplace transforms. Laplace transforms of derivatives and integrals. Convolution theorem. Application of Laplace transforms in solving ordinary differential equations. Laplace transforms of periodic, Unit step and Impulse functions.
3. **Ordinary Differential Equations** : Linear differential equations of higher order with constant coefficients, Method of variation of parameters. Higher order linear differential equations with variables coefficients (Cauchy's and Legendre forms). Simultaneous linear differential equations. Models for the real world problems and their solutions in particular. Modelling of electric circuits. Deflection of beams. Free oscillations. Forced oscillations. Resonance. Solution of Bessel and Legendre equations by series method. Definition and properties of Bessel's functions. Legendre polynomials and properties like recurrence relations, orthogonality
4. **Partial Differential Equations** : Formation of Partial differential equations. Directly integrable equations, Models of Engineering problems leading to first order partial differential equations. Lagrange's equation. Solutions of special type of first order partial differential equations. Homogeneous linear equations with constant coefficients. Applications of partial differential equations. Boundary value problems and method of seperation of variables. Modelling of vibration of a stretched string one dimensional wave equation
5. **Numerical Methods** : Motivation. Error. Truncation error, Rounded off error, Absolute error. Relative error and Percentage error. Solution of algebraic and transcendental equations by Newton-Raphson. Bisection. False position and extended iteration methods. Convergence of these methods.

Reference Books

1. Dr. B. S. Grewal — Higher Engineering Mathematics, Khanna Publishers, New Delhi
2. Prof. Wartikar & Wartikar — Engineering Mathematics — Vol. I, II. Pune Vidyarthi Griha Prakashan

3. Dhavan & Shrivastav	: Engineering Mathematics. Danpat Rai & Sons, New Delhi.
4. S. S. Sastry	: Engineering Mathematics-Vol. I & II. Printice Hall of India, New Delhi.
5. P. D. S. Verma	: Mathematics for Engineering Students. Kalyani Publishers, Ludhiyana & Delhi.
6. N. P. Bali, Ashok Saxena & Iyengar	: A Text Book on Engineering Mathematics, Laxmi Publication (P.) Ltd., New Delhi.
7. Kandasamy, Thilagavathi & Gunavathi	: Engineering Mathematics Vol. I, I, III S. Chand & Co. (Pvt.) Ltd., New Delhi.
8. Chandrika Prasad	: (1) A First Course in Mathematics for Engineers, (2) Mathematics for Engineers, (3) Advanced Mathematics for Engineers, Prasad Mudranalaya, 7 Veli Avenue, Allahabad.
9. Kumbhojkar, G. V.	: Engineering Mathematics Vol. I, II, III, IV. C. Jamnadas & Co. Bombay.
10. Majumdar, T.	: Engineering Mathematics Vol. I New Central Book Agency (P) Ltd., 8/1 Chintamani Das Lane, Calcutta.
11. Erwin Kreyszig	: Advanced Engineering Mathematics (Fifth Edition), Wiley Eastern Ltd., New Delhi.

B.E. Sem-III (CE)

303. Control and Instrumentation

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Generalized Measurement system : Zero order, first order and second order system, modeling, static and dynamic characteristics.

Sensor for measuring following quantities, ranges and interfacing circuits :

(a) Mechanical Quantities : Displacement, velocity, acceleration.

(b) Temperature

(c) Flow

(d) Pressure

Digital sensors. I.C. sensors and chemical sensors.

Feedback control system : Open loop and closed loop control system block representation. Effects of feedback on system parameters and dynamics.

Time-Domain analysis : Steady state analysis and transient responses. Error coefficient.

Freq response analysis : Bode plots correlation between time and frequency responses.

Stability analysis : Concept of stability condition for stability routh stability criterion, gain and phase margin. Design and compensation techniques : Lead, lag and lead lag compensation. Transform methods.

Text/Reference book(s)

1. Measurement systems-Application and design by E. O. Deobelin.
2. Control system engineering by I. J. Nagarath and M. Gopal.
3. Modern Control Engineering by K. Ogata.
4. Transducers and instrumentation by D.V.S. Murthy.

305. Business Information Systems

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Introduction to business system : Data capture, processing, Dissemination, storage/retrieval, I/O and storage devices, terminals printers and disks.

Principal of data processing : Data representation and 7 file management in cobol sequential, indexed and relative files user interfaces, report writer, screen management.

Data management software : Packaged software, word processors, spread sheets, data management packages such as dbase and foxpro.

Principles of software engineering : Software development methodology, system analysis. dfd.er model Design concepts. Software architecture. File (table) and process design. Issue in system implementation. Enterprise resource planning (epr), management resource planning (mrp-2) software like sap, marcan.

Special topics : Introduction to management information system and decision support systems.

Text/Reference book(s)

1. Structured cobol programming with application by N. I. Sarda.
2. Cobol programming by Roy and D. Ghosh Dastidar.
3. Software Engineering by R. S. Pressman.

401. Descrete Mathematics

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	1	100	3	—	25	—	125

Objective of the course : To introduce the mathematical tools needed to handle discrete structures such as finite set combinatories and finite graphs and mathematical rigour and discipline needed to analyse algorithms.

The material can be broken into two parts, one based on the concept of modern algebra as applied to sequential machines and computer systems, the other based on graph and tree as applied to data structure and algorithms.

1. **Predicate Calculus (10%) :** Introduction, Objectives, Predicates, statement functions. variable and quantifiers, free and bond variables, special valid formulas involving quantifiers–Theory of inference for the predicate calculus.
2. **Fuzzy sets (20%) :** Some useful definitions, basic operations on fuzzy sets, range and inverse images, 1-V fuzzy sets, fuzzy relations.
3. **Group theory (20%) :** Definition and examples of semigroups, monoids and groups Abelian group, cyclic group; subgroup, permutation groups, coset decomposition of groups normal subgroups, lagranges theorem.
4. **Lattices (20%) :** Poset, lattice as a poset, properties of lattices. lattices as algebraic systems sublattices, direct produce and homomorphism, complete lattices. bounds of lattices distributive lattices, complemented lattice.
5. **Boolean Algebra (20%) :** Introduction, definition and properties, sub-Boolean algebra difect product and homomorship, atoms, stone's representation theorem. Boolean expressions and their equivalences. Minterm and max terms Boolean algebra values of boolean expressions. canonical forms, boolean functions, symmetric boolean functions
6. **Graph Theory (20%) :** Basic concept of graph theory; basic definitions: Path, reachability and connectedness, matrix representation of graphs; trees

Reference books

1. Tremblay, J. P. & Manohar Discrete mathematical structures with application to computer science; (McGraw Hill New Delhi)
2. Rosen, Kenneth H. Discrete Mathematics and its applications (McGraw Hill, New Delhi)
3. Alan Doerr & Kenneth L. Applied discrete structures for computer science (Galgotia publications pvt. ltd., New Delhi)
4. Kolman, B. & Busby R. C. Discrete mathematical structures for computer science (Prasntice Hall of India Pvt. Ltd., New Delhi).
5. Georgr J. Klir/bo yuan. Fuzzy sets and fuzzy logic. Theory and applications. Printice Hall of India, New Delhi, 1997.

402. Data Communication

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	[illegible]	[illegible]

Modulation of signals : Principles of analog modulation techniques like fm, pm, ssb. Generation and detection (Block schematics only) frequency division multiplexing. pulse modulation . Pulse tranmission over band-limited signal, sampling theory, pulse amplitude modulation Timedivision multiplexing. Isi eye diagram.

Digital communication : PCM DCPM. DM. ADM comparison of above system on the basis of performance criteria such as bit tranmission, signaling rate. Error probability.S/N/Ratio. bandwidth requirement.

Digital modulation techniques : Data transmission using techniques such as psk, fsk, qpsk, (qam), msk, inter system comparision.

Coding for communication : Information theory, channel capacity shannon's theorems. Source coding. Error control coding. Error deection and correction. Block code. Cyclic code. Line code. Channel throughputand efficiency.

Network protocols : ISO-OSI model. Protocol levels. Physical layer protocols. Rs232, RS422. 423 standard. Link level protocol HDLC. SDLC. network level protocol X. 25.

Modem : Principle of modem. Functions. Operation of some specific modems. Short haul modems. Digital Modems. Multiplexers and concentrators.

Broad view of communication channel : Tranmissionine Primary and secondary line, constant, telephone line and cables. public switch telephone network (Electronic Exchange) fibre optic.

Communication : Principles of light communication in fiber, losses in fibers, losses in fibers dispersion light sources and photo detector, connectors and splicers.

Satellite communication . Orbits, satellite altitude, multiple access method.

Text/Reference book(s)

1. Electronics communication by Roddy Coolan.
2. Data communication by Schweber W. L.
3. Digital analog and data communication by Sinnema William.

403. Digital and Logical Design

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Data and number representation–Binary–Complement representation BCD–ASCII, ISCII.

Boolean algebra. logic gates, minimization, use of programs such as expresso in minimization

Digital circuit technologies, RTL, DTL/DCTL/TTL/MOS/CMOS/ECL, Analysis of basic circuits in these families. internal architecture of programmable logic devices.

Combinational design, design with muxes.

Sequential circuits, flip-flops, conters, shicft registers, multi vibrators, state diagrams sequential circuit design from state diagrams-vomputer aids in synthesis.

Memory system–RAM, ROM.EPROM.EEPROM, PAL, PLDS, PGAS. Bus structures, transmission line effects. line termination. ad and da conversion techniques and selected case studies. CAD TOOLS. FPGA Based design exercises.

Introduction to vls design. custom and semi-custom design.

Test/Reference book(s)

1. Digital desilgn by Morris Mano.
2. Designilng with fpgas and cplds by Jesse H Jenkins.
3. Digital integrated electronics by H. Taub & D. Schilling.
4. Vhdl by Douglas L. Perry.
5. Introduction to vlsl systems by C. Mead and I Conway.
6. Electronics for scientists and engineers by T. R. Viswanathan, G. K. Mehta and Rajaraman.
7. Integrated electronics, analog and digital circuits and systems by J. Millman and Halkias.

404 Computer Architecture

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Principles of computer design : Software/hardware interaction, cost/benifit, concept of layers in architeture design.

Basic computer organization taking 8005 as an example, binary arithmetics-add, subtract, multiply, divide- algorithms and implementations carry look ahead and fast adders.

Cpu design : Choice of instruction set, control structure-hardwired and milcroprogrammed control-risc vs ctsc, pipelining in cpu design, suparscalår machines.

Memory hierarchy design : Caches, main memory, internal memory, virtual memeory, architectural aids in implememting these.

I/O Modes : Programme, interrupt, dma, channel, I/O Processor cpu/memury interaction with operating system, serial/parallel interfaces taking 8251 and 8255 as examples.

Performance evaluation : Spec marks, linpack, whestone, dhrystone etc. Transaction processing benchmarks.

Multiprocessors : Parallel & distributed computers SIMD, SPMD, MMD machines.

Text/Reference book (s)

1. Computer Architectures by Patterson and Hennessy.
2. Computer organization and design by P. Pal Chaudhary.
3. [illegible] architecture by P V S Rao
4. [illegible]

405. Programming Language [illegible] O.P. & Window)

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	4	100	3	—	25	25	150

1. Object oriented concepts : Object oriented development, the object modeling technique, objects and classes, generalization and inheritance, aggregation.
2. Object oriented programming style & languages : Object-oriented style. reusability, extensibility, class definitions, creating objects, calling operations, using inheritance, implementing association, object-oriented language features.
3. Object oriented languages : An example basic programming, output using cout, preprocessor directives, variables, input and output, manipulators, type conversion, operators, library functions, loops & decisions. structures, enumerated data types, simple functions, passing arguments, overloaded functions, inline functions, default arguments,

A simple class, objects as physical objects & as data types, constructors objects as function arguments, returning physical objects & as data types, constructors objects as function arguments. returning objects from functions, structures and classes, classes. objects and memory, static class data, array fundamentals, arrays as class member data, arrays of objects. strings.

Function overloading & operator overloading overloading unary operators, overloading binary operators, Data conversion, inheritance, class hierachies, public and private inheritance, levels of inheritance, multiple inheritance, containership, classes within classes, pointers, memory management, new and delete, pointers to objects, pointers to pointers, debugging pointers virtual function, friend functions, static functions, assignment and copy initialization, the this pointer streams, string I/O, character I/O, object I/O, I/O with multiple objects, file pointers, disk I/O with member functions, error handling, redirection, command line arguments, printer output, overloading the extraction and insertion operations multi-file programs, using the project feature.

• Introduction & use of single user operating systems MS-DOS . Internal commands and external commands like date, time, copy, ren, md, cd, tree, diskcopy, xcopy, mem etc. Config.sys and autoexec. Bat file and batch file programming, macros

Windows—Introduction to windows environment; features of windows 3.1 and windows 95 : Customizing windows, the start menu, control panel, using the windows interface to create, print, and store a file, using explorer & other file utilities. managing disk resources and utilities, disk defragmenter, scandisk, running applications, the usage of a ms dos-based application operating in windows, overview of ms-office.

Text/Reference book (s)

1. Object orinted programming in turbo C++ by Robert Lafore (Galgotia, 1994)
2. Programming with C++ by Balagurusamy.
3. DOS manual and windows 95 manual.

501. Database Management Systems

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Introductory concepts three scheme architecture of dbms brief history of dbms development introduction to er model introduction to relational data model, relational algebra, introduction to sql.

Database design conceptual database design. Theory of normalization.

Relational theory and sql relational concepts : Relational algebra, relational calculas, ansi-sql-ddl dml, constraints and assertions, views, database security.

Application development using sql : Host language interface and embedded sql programming 4 gl's forms management and report writes stored procedures and triggers.

Internals of rdbms physical data structures, data systems archiecture, query optimization : Join algorithm, statistics and cost base optimization transaction processing, concerrency control and recovery management transaction model properties and state serializabilaty, lock base protocols, two phase locking.

Special topics brief introduction to distributed database systems, teompral databases and object oriented database

Texts/References

1. H. F. Korth and Silberschatz Abraham, Database systems concepts, mcGraw Hall, 1991.
2. Ramez Elmasri and Shamkant B. Navatha, Fandamental of Database systems, the [illegible] mcummings publishing co., second edition, 1994.

502. Data Structures and Programming Methodology

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4		100	3	—	25	25	150

[illegible] Linear data structures I Arrays & Records, Linear data structures II Linked [illegible] structures IV Strings

[illegible] Non Linear data Structures I : Trees. Non linear data structures II : Hashins, [illegible], graphs, files.

Texts/References

1. Aho A. V., J. E. Hopcroft, J. D. Ullman : Data structures and algorithms, addison-wesely, 1983
2. Baase, S. : Computer Algorithms : Introduction/to design and analysis, addison-wesely, 1978.
3. Berztiss, A. T. Data structures, Theory and Practice : 2nd ed. Academic Press, 1977.
4. Collins, W. J. Data structures, an object-oriented approach, addition-wesely, 1992.
5. Goodman, S. E., S. T. Hedetniemi : Introduction to the design and analysis of algorithms, McGraw-Hill, 1977
6. Horowitz, E. S. Sahni : Algorithms : Design and analysis, computer Science Press, 1977.
7. Horowitz, E. S. Sahni : Fundamentals of data structures in pascal, computer sciences press, 1984
8. Knuth, D. E. : The art of computer programming, vols 1-3, addison wesely, 1973.
9. [illegible] R. L. : Data structures and program design, 2nd ed., Prentice Hall, 1987.
10. [illegible] : Sorting and sort systems, addison-wesley, 1975.
11. Standish, T. A. : Data structure techniques, addision-wesley, 1973
12. Tremblay, J. P., P. G. Sorenson : An introduction to data structures with application, McGraw Hill, 1976
13. Wirth, N. : Algorithms data structures. Programs, Prentice-Hall, 1976.

503. Microprocessor & Interfaces

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Architectural features of 8-16-32 bit Microprocessors, selected case studies.

Support components : Memories, serial and parallel interfaces, peripheral controllers, dma controllers.

Design with bitslice microprocessors.

Single chip microcontrollers.

Case studies.

Microcomputer development systems.

New developments in microprocessor technology

Selected applications and design exercises.

Texts/References

1. Daniel Tabak, Advanced Microporicessors. McGraw Hill, inc. second edition, 1995.
2. Douglas V. Hall, Microprocessor and Interfacing : Programming and Hardware, Tata McGraw Hill.
3. Charles M. Gilmore, Microprocessor : Principles and applications, McGraw Hill.
4. Harry Garland, Introduction to Microprocessor system design, McGraw Hill.

504. Computer Oriented Numerical Tech.

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Methods for solution of equation.

Errors (and numerical and instabilities) in numerical methods.

Solution of Simulataneous Linea algebraic equation

Interpolation.

Least squares approximations.

Numerical defferentiation and integration

Ordinary Differential Equations.

Texts/References

1. Numerical methods with fortran IV case studies, William S. Doon. * Daniel D. Mccracken
2. Computer oriented numerical methods, Rajaraman

505. Computer Peripherals and Interfaces

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Familiarity with various [illegible] of PCs. Exercises [illegible] a PC and testing the same, maintenance procedures, exercises on fault finding.

Selected exercise on interfacing peripheral like floppy/hard [illegible] to a PC and writting and I/O driver and Integrating with the overall system

Texts/References

1. P. Pal Chaudhari, Computer organization and design, Prentice Hall of India [illegible]
2. Robert S. Lai/The write group, writing MS DOS Device Drivers, addison [illegible] publishing co., 2nd ed., 1992
3. Joseph Di Giacomo : Digital [illegible] Circuits, Microcomputer [illegible] and Links Academic Press, 1986
4. D. Del Corso, H. Kirman, J. D. Nic[illegible] : Microcomputer Buses and Links Academic Press, 1986
5. Govindarajulu B. IBM PC and clones : Hardware, Trouble Shooting and Maintenance Tata McGraw Hill, 1991
6. Douglas V. Hall, Microprocessor and Interfacing [illegible] Hill International editions, [illegible] 1992

601. System Programming

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs	Sess marks	Pr. Oral marks	Term work	Total marks
2	2	100	3	—	25	25	150

Assemblers.

Macro Processors.

Loader & Linkers.

Editors & Debuggers.

Intro.. ction to Compilers

Introduction to operating systems

Texts/References

1. Barron D. W., Assemblers and Loaders, 2/E, New York, Elsevier, 1972
2. Beck L. L., Systems software : An introduction to systems programming, addison-wesely, 1985
3. Calingare P. Assemblers, compilers and program translation rockville, md. computer science.
4. Dongvan J. J., Systems programming, New York, McGraw Hill, 19..
5. Grosline G. W., Assembly and Assemblers, the Motorola 6800.. fa.. .. prentice hall
6. Ullman J. D. Fundamental concepts of programming systems, addis.. .. wesley
7. Dhamdhere, D. M. Introduction to systems software, McGraw Hill
8. Glngaert P., Assemblers, Loaders and Compilers, Prentice Hall.
9. Echouse, R. H. and Morris, L. R. Minicomputersystems, Prentice Hall
10. Rochkind, M. J. Advance C Programming of compiler design, addision-wesley.
11. Biggerstaff, T. S., Systems software engineering, McGraw Hill
12. Finsett, C. A. The craft of te.. editing, spr.. ger verlag.
13. Shooman, H. L., Software Engineering McGraw Hill
14. Aho A. V. and J. D. Ulman, Principles of compilers design, addision wesley
15. Aho A. V. and Ullman J. D., The theory of parsing, translation and compilling, vol. I addision-wesley
16. Aho A. V. and Ulman J. D., The theory of parsing, translation and compiling, vol. II addision-wesley.
17. Aho A. V. Sethi R. and Ulman J. D., Compilers, Principles, Techniques and Tools, Addision-wesley.

602. Design and Analysis of Algorithm

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Modles of computation, algorithms, analysis. Order arithmetic time and space complexities, average and worst case analysis, lower bounds.

Algorithms design techniques : Divide and conquer, search and traversals, dynamic programming, backtracking, branch and bound.

Sorting and searching algorithms, combinatorial algorithms, string processing algorithms, algebraic algorithms, set algorithms. Hard problems and approximation algorithms.

Problem classes P., NP, NP-HARD and NP-COMPLITE, Deterministic and nondeterministic polynomial time algorithms. Approximastion Algorithms for some NP-Complete Problems.

Texts/References

1. D. E. Knuth, the art of computer programming, vols I and 3, addision-wesley.
2. A. V. Aho, J. E. Hopcroft., J. D. Ullman, Design and analysis of Algorithms, addision-wesley.
3. E. Horowitz, S. Sahni, Gundamentals of computer algorithms, galgotia Publishers, 1984.
4. F. Mehlhorn, Data structures and algorithms, vol. 1 and 2, Springer Verlag, 1984.
5. P. W. Purdom, Jr. and C. A. Prown, The analysis of algorithms. Holt Rinehart and Winston.

603. Operating Systems

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Introduction to os. Os services and kernal, multiprogramming and time sharing, processor scheduling.

Memory management, paging and segmntation, virtual memories, I/O and device management, disk and file management, deadlocks, concurrent processes.

Protection and security, introduction to multiprocessor and distributed operating systems.

Texts/References

1. A Silberschatrz and Peter B. Galvin, Operating system concepts, addision-wesley.
2. D. M. Dhandhere, Systems programming & operating systems (2nd edition) Tata McGraw Hill.

604. Advanced Microprocessor

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Review of 8 bit microprocessors and support components.

Selected case studies of 16/32/64 bit microprocessors and support components

Risc architectures and case studies : Risc vs. cisc.

Power PC 601, Alpha 21064, Pentium, super, sparc, transputer architectures and case studies

High performance embedded microcontrollers, case studies.

403GA development systems and support.

Selected applications.

Text/References

1. J. J. Cain, Selected reprints on microprocessors and microcomputers, ieee computer society.
2. M. Rafiquzzaman, microprocessors & microcomputer development systems, harper tow
3. M. Rafiquzzaman, Microprocessors & microcomputer based systems design, Universal Book Stall, New Delhi.
4. Inmos Ltd., Transputer development system, Prentice Hall.
5. Inmos Ltd., Communicating process architecture, Prentice Hall.
6. Wunnava V. Subbarao, 16/32-bit microprocessors 68000/68010/68020, Software, Hardware & Design applications, Macmillan publishing company, 1991.
7. Kenneth Hinitz, Daniel Tabuk, Microcontrollers architecture, Implimentation & programming, McGraw Hill.
8. Data books by intel, motorola, etc.
9. Daniel Tabak, Advance microprocessors, McGraw Hill.
10. Andrew M. Veronis, Survey of advanced microprocessors, van nostrand reinhold
11. Daniel Tabak, Risc system, John Wiley & Sons
12. The Power PC architecture : A specification for a new family of risc processors, edited by cathy may, ed silha, rick simpson, hank warren, morgan kulfmann publishers.
13. Charles M. Gilmore, Microprocessors Principles and Applications. McGraw Hill International ..
14. Power PC 403GA embedded controller user's manual.
15. Power PC Tools : Development Tools for PowerPC Microprocessor.
16. Powerpc 601 risc microprocessor user's manual.

605. Application Development Tool Lab.

Teaching Scheme		Examination Scheme					
Theory	practical	Theory marks	Hrs.	Sess marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Case tools . Use of diagramming tools for system analysis, such as turbo analysis for preparing data flow diagrams and e-r diagrams. Use of tools for relational database design such as rational designer.

Application development tools : Use of tools such as power builder, delphi, magic etc. in developing application software including interactive data-entry screens, transaction processing, report generations, etc.

Management tools : Use of tools for managing the process of software development such as source code control system (Sccs); Revision control system (RCS), make etc.

Texts/References

1. Products manuals from concerned vendors.
2. B. W. Kerninghan, R. Pike, The unix prog. environment, Prentice Hall.

606. Computer & Society

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
2	—	100	3	—	—	—	100

A survey of a variety of computer application.

Impact of introduction of computers on the nature of employment.

Networking of computer and its impact on privacy and security.

Information integrity.

Ethical issues arising out of creaction of computer viruses, trojan horses etc.

Intellectual property rights in relation to computer hardware/software data banks and their impact on society.

The role of computers in education.

Texts/References

1. Weizenbaum J. Computer power and human reson from judgement to calculation. W. H. Freeman, San Francisco.
2. Dunlop C. Kling, R. (Editors) Computerization and controversy : Value conflics and social choices.
3. Panerjee, Utpal (editors) information technology for common man. Concept Publishing Co.

701. Computer Networks

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Introduction to computer networks and data communication fundamentals. Network structures and architecture. Physical layer and data link layer. Satellite and packet radio networks. Local area networks (lan). Network layer. Internet working and ISDN/B-ISDN. Transport, session presentation and application layers.

Advanced topics : Distributed systems, Network management, conformance testing and interoperability.

Texts/References

1. J. A. Stankovic, A perspective on distributed computer systems, IEEET Trans, computers.
2. S. Mullender, (ed.), Distributed systems, addision-wesley, reading.
3. Paul E. Green (Jr.), Computer network architectures and protocols Plenum Press.
4. P. E. Green, Protocol conversion, IEEE trans, commun. vol. com-34.
5. A. S. Tanebaum : Computer Networks : Prentice Hall.
6. Marshall T. Rose, Challenges in network management, IEEE network magazine.
7. L. Bernstein and C. M. Yuhas, Managing telecommunication networks, IEEE networks Magazine.

702. Software Engineering

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Introduction of software engineering. Requirements engineering. Structured system design. Data oriented analysis & design. Analysis & design of real time systems. Software quality

assurance. User interface design. Software complexity & Reliability. Software project management.

Texts/References

1. Pressman R. S., Software engineering : A Practitioner's Approach. McGraw Hill
2. Ghezzi C. Jazayeri M. and Mandrioli D. : Fundamentals of software engineering. Prentice Hall
3. Pfleedger S. L., Software engineering : The production of quality software
4. Radice R. A. and Phillips R. W. Software engineering, an industrial approach vol. I, Prentice Hall.
5. S. R. Software engineering, Aksen associates incorporated publishers.
6. Boehm B. W., A sprial model of software development and enhancement, IEEE computer
7. Fairely R., Software Engineering concepts, McGraw Hill.
8. Sommerville I., Software engineering, addision-wesley.

703. Elective I–(1) Digital Signal Processing

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Fundamental concepts of signal analysis. Orthogonal functions. Fourier analysis. Fourier and Z-Transforms. Linear systems. Sampling. Discrete fourier transforms. FFT Algorithms. Sequences and Trasforms. Discrete Systems.

Texts/References

1. B. P. Lathi, Signals and communications, wiley.
2. A. V. Oppenheim and R. W. Schafer, digital siganal, processing, Prentice [illegible]
3. R Rabiner and B. Gold, Theory and application of digital signal processing prentice hall
4. C. F. Chen, one dimentional digital signal processing, marcel dekker [illegible]
5. A. V. Oppenheim et.al., Signals and systems Prentice Hall.

703. Elective I–(2) Language Processor

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Overview of the traslation process, lexical analysis : Hand coding and [illegible] generation lexical analyzers.

Parsing theory : Top down and bottom up parsing algorithms, [illegible] generation of parsers.

Error recovery : Error detection & recovery. AD-HOC and systematic methods

Intermediate code generation : Different intermediate forms. Syntax directed translation mechanisms and attributed definit[illegible]

Run time memory management : Static memory allocation and [illegible] allocation schemes.

Symbo table management.

Code generation : Machine model, order of evaluation, resister allocat[illegible] [illegible] selection

Code optimization : Global data flow analysis, afew selected optimi[illegible] [illegible] sub expression removal, loop invariant code motion, strength reduction etc

Texts/References

1. A. V. Aho, Ravi Sethi, J. D. Ullman, Compilers tools techniques [illegible]
2. D. M. Dhamdhere, compiler construction construction-principals and [illegible] Hill
3. Tremblay J. P. and Sorenson, P. [illegible]. The theory and practice of compiler [illegible]
4. Waite W. N. and Goos G., Compiler construction springer verlag

703. Elective I–(3) Formal Language & Automata Theory

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total*
4	2	100	[illegible]	—	[illegible]	[illegible]	[illegible]

Basic ... operations on languages. Closure properties of language classes. Context free languages ... Chomsky, greibach normal forms. Linear grammars and regular languages. Regular expressions. Context sensitive languages. The kuroda normal form, one sided context sensitive grammars.

Unrestricted languages : Normal form and derivation graph. Automata and their languages, finite, Pushdown ... pushdown automata and turing machines. The equivalence of the automata and the appropriate grammars. The dyck language.

Syntax ... Ambiguity and ... formal properties ... Formal properties of LL(K) and LR(K) Grammars.

Derivation languages : Rewriting systems, algebraic properties, canonical derivations, context sensitivity.

Cellular automata : Formal language aspects, algebraic properties University & Complexity Variants.

Texts/References

1. G. E. Reeve, Introduction to formal languages, Mc Graw Hill.
2. M. H. ..., formal language theory, addision-wesley.
3. S. Wolfram, Theory and applications of cellular automata, world scientific.

... Elective II (1) Simulation & Modelling

Teaching Scheme		*Examination Scheme*					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
		100	3		25	25	150

... modelling system theory ... state variables.

Theory of models : Analytic simulation, measurement. Analysis modelling ... probability ...

... Estimation of simulation output metrics confidence intervals. Regenerative simulation, method of batch means.

Basic theory ... systems ... Application to operating systems, data bases networks, architecture ...

Further ... G/G/1, G/G/C correlated queues, queuing networks, mean value analysis, GTPN, ESPN.

Texts/References

1. M. K. ..., Fundamentals of performance modelling, Mcmilian, 1984.
2. R. Nelson, ... stochastic ... queueing theory, spring verlag.
3. Kleinrock, ... queuing system ... John Wiley.
4. K. S. ..., Probability & statistics with reliability queueing & computer science applications, prentice hall.
5. E. D. ...ska, J. Zohorjan, G. S. Graham & K. C. Sevcik, Qualitative system performance ... queueing network models Prentice Hall.
6. ... getting started with simulation programming in C & C++.
7. H. S... introduction to process control simulation & csmi 1990 ... simulation conference ...

704. Elective II – (2) Artificial Intelligence

Teaching Scheme		*Examination Scheme*					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4		100	3	—	25	25	150

Overview of ... Artificial Intelligence. Formalized symbolic logic. Rule based deducation & expert system ... languages ... problem solving. Structured knowledge representation. Searching and mathing. ... system architecture & tools. Natural language processing. Learning systems.

Texts/References

1. Rich E. Artificial intelligence, Mc-Graw Hill.
2. N. J. Nilsson, Principles of Artificial intelligence, Kaufmann.
3. D. W. Patterson, Introduction to ai, addison wesely.
4. Charniak and M. Dermalt, Introduction to AI, addision-wesley.
5. A. J. Gongalez & D. D. Dankel, The engineering of knowledge based systems theory and practice, Prentice Hall.
6. G. F. Lager and W. A. Stubblefield, Artificial intelligence and the design the expert systems, Benjamin Kummings.
7. Waterman, A Guide to expert systems, addision-wesley.
8. Mockler, R. J. Developing knowledge-Based systems using an expert systems shell, Maxwell Machmillan.
9. Badiran, A. B., Expert system, applications in engineering and manufacturing, Prentice Hall.
10. Lgnizio, J. P., Introduction to expert systems. The development and implementation of rule based expert systems, Mc-Graw Hill.
11. Durkin, J. Expert systems design and development, Macmilan.
12. Turban, F. Decision support & expert systems management support systems, Macmilan.

704. Elective II–(3) Computer Fault Diagnosis & Servicing

Teaching Scheme		*Examination Scheme*					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	150

Introduction to personal computers; : Types of computer peripherals, general problems, PC, PC-XT & PC-AT operations : Basic parts, system operation, chip location scheme cpu, memory design, bus structure, I/O board power supply, disk drives (HDD & FDD)

Test equipments : Multimeter, digital probes, pulsen digital high frequency oscilloscope, trouble, temperature & voltage measurement, stimulating circuit test points study of varius problems.

Board level servicing : Identifying defective boards, use of PC diagnostic S/W and disk manager S/W, components level servicing : Cheking defective components, passive & active components, differents ICs servicing of perphereals such as : Keyboard, disk drives, printers, monitors, power supply, Installation requirements : caculation of A/C and power supply requirements, ups output requirement, preparation of layout of computer centre, operation & layout of multi-user systems.

Texts/References

1. How to maintain and service your small computer by John G. Stephenson and Bob Cahill
2. IBM PC trouble shooting & repair guide by Robert G. Brenner
3. Trouble shooting & repairing the new personal computers by art margolis
4. The insider s guide to IBM PC Hardware & software by Corey Sandler
5. Managing your hard disk by Berliner.
6. IBM PC-XT Technical reference manual/user's guide.
7. Migro computer operation, trouble shooting and repair by Robert E. Paynter

705. Project

Teaching Scheme		*Examination Scheme*					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
0	6	0	0	0	100	100	200

801. Computer Graphics

Teaching Scheme		*Examination Scheme*					
Theory	practical	Theory marks	Hrs.	Sess. marks	Pr./Oral marks	Term work	Total marks
4	2	100	3	—	25	25	

Introduction : What is computer graphics ? Elements of a graphics, workstation. Device independence fundamental problem S in geometry.

Basic raster graphics : Scan conversion. Filling and Clipping.

Geometric mainipulation : Transformation. Matrices. Homogeneous Coordinates.

Elementary 3D graphics : Plane projections, vanishing points specification of a 3D view.

Visibility : Image and object precision. Z-buffer algorithms area based algorithms, floating horizon.

Advanced issues : Any one of the following topics : (a) Curves and surfaces : Parametric representation. Benzier and B-Spline curves. (b) Rendering : Raytracing, antialiasing, fractals, gourard and phong shading. (c) User interface : Issues in user interface, elements of window systems (X, MAC-OS MSWINDOWS), elements of toolkit programming.

Text/Reference book(s)

1. R. H. Bartels, J. C. Beatty and B. A. Barsky, An introduction to splines for use in computer graphics and geometric modelling.
2. J. Foley, A. Van Dam, S. Feiner, and J. Hughes, computer Graphics : Principles and Practice
3. D. Hearn and P. Baker, Computer Graphic.
4. C. E. Leiserson, T. H. Cormen and R. L. Rivest Introduction to algotithms.
5. David mount, Lecture notes in computer graphics.
6. W. Newman and R. Sproull, Principles of Interactive computer graphics.
7. R. Plastock and G. Kalley, Theory and problems of computer graphics.
8. F. P. Preparatana and M. I. Shamos, computational geometric : An Introduction.
9. D. Rogers and J. Adams, Mathematical elements for computer graphics.
10. David F. Rogers, procedural elements for computer graphics.
11. Alan Watt and Mark Watt, Advanced animation and rendering techniques.
12. D. Young, X window system programming. OSF/Motif edition.

802. Elective III–(1) Advanced Network Techniques

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Topics

1. Hardware/Software requirements of internet, w.w.w.
2. Study of Vsat.
3. TCP/IP.
4. Review of HTML.
5. Check boxes, Radio Buttons and Managing Multiple Controls.
6. Scrollbars, Choice Controls, and Scrolling Lists.
7. Graphics : Fonts, Canvasses, Images and Imagemaps.
8. Graphic Animation
9. Java Multithreing.
10. Java Exceptional handling.
11. Hypertext and Linking Documents.
12. Multimedia Links.
13. Server Includes.

Texts/References

1. Java Workship Programming : Steven Holtzner.
2. HTML : Mary E. S. Morris.
3. TCP.IP : Comer.

802. Elective III–(2) Symbolic Logic & Programming

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Propositional Logic : Syntax and semantics. Validity and consequence. Normal forms. Representing world knowledge using propositional logic.

First order logic : World knowledge representation and the need for quantifiers. Syntex, semantics, validity, consequence, clause normal form.

Introduction to prolog : Syntex of prolog, structure, data representation, execution model, introduction to programming in prolog illustrative examples.

The connection between logical and logic programming : Interpreting logic programs in terms of horn clauses. Deduction from clause form.

Formulas : Resolution. Resolution for propositional logic. Ground resolution. Unification ANF first order resolution. SLD resolution the computational and search rules. SLD trees and interpretation of non-declarative features of prolog

Advanced prolig features : Programming techniques : Structural induction and recursion, extra logic features : Cut and Negation, case studies.

Text/Reference book (s)

1. D. Gries, the science of programming
2. R. R. Stol, set theory and logic.
3. Clocksin, W. F. and Mellish, C. S. Programming in prolog.
4. O. KEEFE, R., The Craft of Prolog.
5. Lloyd, J. W., Foundation of Logic Programming

803. Elective IV–(1) Distributed Systems.

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Introduction to distributed computing. Distribution of data control. Clock synchronization, Distributed termination problem, load distribution, distributed elections. [illegible] problem. dead-looks in distributed systems. introduction to fault-tolerant computing.

High level language supports for distributed computing. Message passing primitives, atomic actions, remote procedure call mechanisms. implementation of these features. Case study of some language like occam II, Linda.

Formal development and verification of distributred algorithms

Texts References

1. S. S. Colouris, J. Dollimore and T. Kindberg, distributed systems : communits and design, addison wesley, 2nd ed., 1994.
2. G. Tel, Introducation to distributed algorithms, Cambridge University Press, 1994.
3. K. R. Apte, Programme Verification, 1991
4. S. Mullender (ed.), Distributed system, addison wesley 1989.
5. P. L. Mcentre, et. al Distributed computing : Concept and Implementations, IEEE Press, 1984
6. Y. Parkar (ed.), Distributed computer systems, Academic Press, 1983
7. B. W. Lampson (ed.), Distributed systems : Architecture and applications : An advance course, springer-verlag 1983
8. B. Simon and A. Spector (eds.), Fault-Tolerant distributed computing springer, 1990
9. Research paper from some current journals

803 Elective IV–(2) Image Processing and Pattern Recognition

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Background : Introduction to electronic systems for image transmission and [illegible] computer processing and recognition of pictorial data. overviews of practical applications.

Fundamentals : Mathematical and perceptual preliminaries. human visual system [illegible] signal representation. imaging system specification building image quality, [illegible] parameters image data formats.

Image processing techniques : Image enhancement image restoration image [illegible] extraction. image [illegible] compression and [illegible] [illegible]

[illegible] of color image [illegible] [illegible] techs [illegible] transformations. extension of [illegible]

Hardware architecture for image processing : Distributed processing of image data, role of array processing, standard image processor chips (As Example).

Applications of image processing : Picture data archiyal, Machine vision, medical image processing.

Texts/References

1. Praii. W. K., Digital image processing, John Wiley, N. Y., 1978.
2. Rosenfield, A and Kak, A. C., Picture processing, Academic Press, N. Y., 1982.
3. Jain, A. K. Fundamentals of digital image processing, englewood cliffs, Prentice Hall, 1989.

803. Elective IV-(3) Operation Research

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Introduction to or modeling approach and various real life situations.

Linear programming problems & applications, various components of LP problem formulation. solving linear programming problem using simulataneous equations and graphics method simplex method & extensions.

Sensitivity analysis. Duality theory. Revised simplex. Dual simplex. Transportation and Assignment problems. Network analysis including pert-cpm.

Concepts of network. The shorted path. Minimum spanning tree problem. Maximum flow problem. Minimum cost flow problems. The network simplex method. Project planning & control with pert & cpm.

Integer programming concepts, formulation, solution and applications. dynamic programming concepts formulation, solution and applications. Game theory. ueuting theory & applications. [illegible] programming methods and applications simulation.

Texts/References

F. S. Hillier & G. J. Lieberman, Introduction to Or, McGraw Hill Int. Series. 1995.
[illegible], Introduction to Or, John Wiley & Sons, 1993.
[illegible] computer assisted decision models, Tata McGraw Hill, 1991.

804. Project

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
0	6	00	0	0	100	100	200

805. Parallel Processing

Teaching Scheme		*Examination Scheme*					
Theory	*practical*	*Theory marks*	*Hrs.*	*Sess. marks*	*Pr./Oral marks*	*Term work*	*Total marks*
4	2	100	3	—	25	25	150

Introduction to parallel processing. Architectural classifications and techniques.

Arithmetics and instruction pipelines, pipelining hazard and scheduling theory, super scalar tectures, asynchronous pipelines.

Interconnection networks. hyper cubes, suffle exchanges, tree, meshes and butterfly networks, [illegible] algorithm for linear algebra, sorting, fourier transform. Systolic arrays.

Vector processors. Shared memory multiprocessor systems. Data flow architectures. Parallel processing-software issues, operating systems for parallel processors. Selected case studies of parallel computing systems.

Texts/References

John L. Hennessy and David A. Patterson, computer architecture : A quantitative approach, morgan kaufmann publishers, inc. 1990.

Kai Hwang and Faye A. Briggs, computer architecture and parallel processing, McGraw Hill International editions, 1985.

D. P. Siewiorek, C. G. Bell, A newell, computer structures; Principles and Examples, McGraw Hill. 1982.