Outlines of Tests, Syllabi and Courses of Reading in the Various Subjects for Examination 2011-12

English (Compulsory)

Time : 3 Hours **Max. Marks : 100**

Texts Prescribed

1. *Tales of Life* (Guru Nanak Dev University, Amritsar)
   The following tales are excluded:
   A. *The Egg*
   B. *In Another Country*
2. *Prose for Young Learners* (Guru Nanak Dev University, Amritsar)
   The following chapters are excluded :
   A. *He Was A Man of The Trees*
   B. *Conservation of Wild Life*
   C. *Women Empowerment*
3. *Murphy's English Grammar,* (Raymond Murphy), 3rd Ed. CUP 2004, Rept. 2005, Unit 1-41, 49-52, 69-91

Instructions for the Paper Setters/Examiners

Note : The question paper will consist of three sections and the distribution of marks will be as follows:

Section-A	**:**	**20 Marks**
Section-B	**:**	**48 Marks**
Section-C	**:**	**32 Marks**

Section-A : It will consist of ten (10) questions on usage of Grammar related to units 1-41, 49-52, 69-91 of Murphy's English Grammar (Raymond Murphy) 3rd Edition CUP 2004, Rept. 2005. Each question will carry two (2) marks. All questions will be compulsory.

Section-B : It will consist of eleven (11) questions. Students will be required to attempt eight (08) questions. Each question will carry six (6) marks. The total marks for this section will be 48.

Eight questions (Q. I to VIII) will be set from the two literary texts (four from Tales, four from Prose. The students will be required to attempt any five choosing at least two questions from each prescribed text. The questions (Q. I to VIII) from literary texts will be answered in about 15 lines each.

The next three questions (IX-XI) will be set on vocabulary and composition as given below. All the questions will be compulsory. Question IX will be set on the vocabulary introduced in two prescribed texts. The question should test meaning and usage of items glossed in the text.

Question X will be Translation of a short passage from English to Hindi/Punjabi.

Or

Precis of a short passage (only for foreign students who do not know Punjabi/Hindi).

Question XI will be writing a Personal Letter (with internal choice).

Section-C: It will consist of four questions, each carrying eight marks. Total marks for this section will be 32.

Questions I-II will be set from the two literary texts, one from each. Each question will have internal choice. It has to be answered in not more than 300 words (app. two pages). Question 3 will be writing a paragraph with internal choice.

Question IV will be Comprehension of a passage (about 200 words) selected from either the prescribed book of *Prose or Tales.* Four short questions of 2 marks, each shall be asked on the given passage.

ENGLISH (ELECTIVE)

Paper-A

Time : 3 Hours **Max. Marks 100**

Prescribed Books :

1. ***Apple Cart*** : G.B. Shaw
2. ***Spots of Time*** : G.N.D.U Publication

The following poems are deleted :

(i) The Pulley, (ii) MacFlecknoe, (iii) Strong Son of God, (iv) Dover Beach, (v) Nightingales, (vi) To the Indians who died in South Africa.

3. *Glossary of Literary Terms* (eighth edition) by M.H. Abrams, Wadsworth CENGAGE Learning Publishers, 8th Edn., 2008.

The following literary terms are prescribed for study :

Alliteration, Allusion, Allegory, Ballad, Burlesque, Character, Comedy, Conceit, Connotation, Epic, Elegy Hyperbole, Irony, Metaphor, Narrative and Narratology, Paradox, Plot, Poetic justice, Pun, Point of View.

Instructions for Paper Setters :

Section-A

1. Five questions, each to be answered in not more than 60 words, will be set from the Play *Apple Cart.* Each question will carry 2 marks. The examinees will be required to answer all the questions. (2x5=10 marks).
2. Five questions, each to be answered in not more than 60 words, will be set from the book *Spots of Time.* Each question will carry 2 marks. The examinees will be required to answer all the questions. (2x5=10 marks).

Section-B

1. The examinees will be required to answer two questions on reference to the context out of the three set from the Play *Apple Cart* and two questions on reference to the context out of the three set from the textbook, *Spots of Time.*

(4x6=24 marks)

2. The examinees will be required to write notes on any four out of the six literary terms given from those prescribed in the syllabus. (4x6=24 marks)

Section-C

1. The examinees will be required to answer in 500-600 words one essay-type question out of the two set from the Play *Apple Cart.* (16 marks)
2. The examinees will be required to answer in 500-600 words one essay-type question out of the two set from the textbook *Spots of Time*. (16 marks)

English (Elective)

Paper-B

Time : 3 Hours **Max. Marks : 100**

Books Prescribed

Huckleberry Finn by Mark Twain

Study Reading : *A Course in Reading Skills for Academic Purposes* by E.H. Glendinning and B. Holmstrom, Cambridge Uni. Press, South Asian Edn. 2007, Sept. 2008.

Instructions for paper setting :

The question paper will comprise three sections.

Section-A will comprise *10 questions.* Each question carrying 2 marks, the total weightage of this section will be *20 marks.* The examinees will be required to answer all the questions. The division of marks and the nature of questions to be set from each text will be as follows :

1. Five questions, each to be answered in not more than five sentences, will be set from the Novel, **Huckleberry Finn.**
2. Five questions, each to be answered in a word, a phrase, or a sentence but not more than three sentences, will be set from the textbook, **Study Reading.** The questions must be based on or relate to the tasks given in the textbook, **Study Reading.**

Section-B will comprise *eight questions,* each carrying 6 marks. The total weightage of this section will be *48 marks.*

1. Six questions related to incidents, anecdotes, minor characters, the use of figures of speech, tone etc. will be set from the Novel, **Huckleberry Finn.** The examinees will be required to answer any 4 questions.
2. Six questions related to the tasks in the section *text exploration* in each unit of the textbook, **Study Reading,** will be set. The questions must be of practical nature.

   The examinees will be required to answer any 4 questions.

Section- C will comprise *2 questions,* each carrying *16 marks.* The total weightage of this section will be *32 marks.*

1. Two essay type que stions will be set from the Novel, **Huckleberry Finn**. The examinees will be required to answer any of the two in 500-600 words.
2. Two questions, each consisting of two tasks related to the section *application* in each unit of the textbook **Study Reading,** will be set. The examinees will be required to answer any of the two questions.

Functional English (Vocational)

1) a)	Time Allowed 2½ Hours	Theory Paper-A	Paper-B 3 Hrs.
	Practical	Paper-A	30 Minutes
		Paper-B Nil	
b)	Maximum Marks	Theory Paper-A :	60 Marks
		Practical :	40 Marks
		Theory Paper-B :	100 Marks
		Practical	Nil
Credit hours for teaching		Theory Paper-A :	3Hrs
the subject per week		Practical :	3 Hrs
		Theory Paper-B :	100 Marks
		(with practical devilling)	

Functional English

Paper-A

Phonetics and Phonology

Time : 2½ Hours **Max. Marks (Theory) : 60**
Max. Marks (Practical) : 40

Instructions for the Paper Setters :
The question paper shall consist of three sections as follows:

Section-A will consist of 8 very short answer type questions. All questions will be compulsory. Each question will carry two marks. Total weightage of this section being 16 marks.

Section-B will consist of short answer type questions. The paper setter will set 7 questions and the candidates will be required to answer 4 questions. Each question will carry 6 marks; total weightage of this section being 24 marks.

Section-C will consist of essay type questions. The paper-setter will set 4 questions and the candidates will be required to answer 2 questions. Each question will carry 10 marks; total weightage of this section being 20 marks.

Objectives

* to familiarize learners with the functioning of English sounds.
* to enable learners to achieve accuracy in oral production.
* to enable learners to achieve an optimum level of intelligibility and fluency in speech.

Course Content

Unit-I :	The phonology of English : Phonetic Symbols for Consonants Vowels and Diphthongs Consonant clusters
Unit-II :	The Syllable
Unit-III :	Weak Forms and Contractions

Unit-IV : Word Stress

Unit-V : Sentence Stress

Unit-VI : Intonation : Patterns of Intonation in Simple Sentence Types.

Suggestions for Teaching

1. Lists of minimal pairs may be used (eg. cot-court, ship-sheep, etc.) for practice in listening and speaking.
2. Emphasis is to be placed on the use of spoken language rather than on theory. Once the learners are familiar with the speech sounds, patterns of stress and intonation, they must be given intensive practice in these areas.
3. It must be made clear that the model of pronunciation is not strictly R.P. Learners should follow the dictionary as closely as possible but wherever there are differences between R.P. and the sounds used in Indian English, these differences can be accepted if they do not interfere with intelligibility and clarity of speech. (Teachers may not insist on a perfect articulation of RP sounds.)

Mode of Examination

Written : 60 Marks

Practical : 40 Marks

Total : 100 Marks

Written : Giving symbols for sounds, breaking words into syllables, marking stress in words and sentences, etc.

Practicals: Speaking and listening tasks.

Books Prescribed

1. O'Connor, J.D. Better English Pronunciation, OUP.
2. Hornby, AS : Advanced Learners Dictionary Fifth Edition, Oxford University Press, Oxford, 1996.
3. Jones, Daniel : English Pronunciation Dictionary I Ed., University Books Stall, New Delhi, 1991.

Functional English (Vocational)

Paper-B (Remedial Grammar)

Time : 3 Hours **Max. Marks : 100**

Instructions for the Paper-Setters

The paper shall consist of 3 Sections. Section-A carries 20 marks, Section-B 48 marks and Section-C 32 marks.

Section-A will consist of 10 short question of 2 marks each in do-as-directed format testing the learner's ability to rephrase transform, combine 2 sentences, identify figures of speech etc.

Section-B will consist of 8 questions of 8 marks each. Students will be required to attempt any Six (6). Questions can be set to evaluate the art of narration, expansion of an idea, paraphrasing, letter writing, and precise writing etc.

Section-C will consist of 2 questions with internal choice of 16 marks each to test paragraph writing, report writing or comprehension.

Course Contents

I. **Parts of Speech** : Nouns : Singular & Plural; Articles-definite/ Indefinite; Verbs-Linking Verbs; Intrasitive/transitive verbs, regular/Irregular verbs; Auxiliary Verbs; Tenses and their use Adjectives, Adverbs, Prepositions and Pronouns Confusion of Adjective-Adverbs.

Difficulties with comparative and superlative

Confusion of gerunds and participle errors of concord.

II. **Types of Sentences** : Transformation-Negative, Interrogative Passive/Active Voice; Question-Tags.

III. **Usage** : Use of Who-whom, much-many, still-yet, so that, so as, make and do, errors in use of individual words; requests, greetings, use of courtesy words-introduction, complaints, refusals.

Exercises in all the above aspects of grammar, knowledge and usage should be administered.

Books Prescribed

1. Collins Cobuild Eng. Grammar Work Book.
2. F.T. Wood—*Remedial Grammar for Foreign Students*, Macmillan, 1965.

pj`bl (l`zml)

sm~ : 3 Gt **kl Ek : 100**

p`T-km Eq p`T-psqk~

1. **cxvl pj`bl inbD** (sp`. f`. jigdr isG pE`r, f`. prmjlq isG isD), pj`bl wnlvristl, pitE`l`|
2. glle ickV dir Gr (vxj`r` bdl) nvwg pbilSrz, idll, 1985.
3. pr` rcn`
4. pr` pV k pSn~ d a#qr
5. ivE`krx :
   (a) pj`bl Dnl ival q : ac`rn Eg, ac`rn sQ`n q ivDlE~, svr, ivEjn, sr|
   (E) B`S` vnglE~ : B`S` d` tks`ll rp, B`S` Eq ap-B`S` d` Eqr, pj`bl, ap-B`S`v~ d pC`x-icn|
   (e) Sbd-bxqr Eq Sbd-rcn` : pirB`S`, mFl sklp
   (s) Sbd-SxlE~

Ek-vf q ppr str lel hd`ieq~

1. iks inbD d` s`r j~ asd` ivS` vsq (d ivc iek) 20 Ek
2. smk`ll ieiqh`s, dS-vf, lk-D`r`, kl`qmk gx, sv-jlvnl s`ihq n dx| 20 Ek
3. pr` rcn` : iqn iviSE~ ivc iks iek aq pr` ilKx lel ikh` j`v| 10 Ek
4. pr` d k as b`r pj pSn~ d a#qr| 10 Ek
5. nbr 5 aq idql ivE`krx d E`D`r 'q vrxn`qmk pSn 20 Ek
6. aprkq lVl nbr 1 Eq 2 dlE~ psqk~ ivc sKp a#qr~ v`l 10 pSn pC j`xg| hrk d` a"qr 50 Sbd~ q vD n` hv| 10x2=20 Ek

Punjab History & Culture

(from Earliest Times to 1000 A.D.)

(Special Paper in lieu of Punjabi Compulsory)

Time : 3 Hours **Max. Marks : 100**

Total Teaching Periods : 75

Note : Each question paper may consist of two Sections viz. A and B as under :

Section-A : The examiner shall set 10 questions and the candidates will attempt any 7 questions carrying 4 marks each. Answer to each question shall be in 10 to 15 sentences. The total weightage of this section shall be 28 marks.

Section-B : The examiner shall set 8 questions which will cover the entire syllabus. The candidates will attempt any 4 questions in atleast 5 pages each. Each question carry 18 marks. The total weightage of this section shall be 72 marks.

1. Physical features of the Punjab and their impact on history.
2. Sources of the ancient history of Punjab.
3. Harappan Civilization : Antiquity, Extent, end, important places, script, town planning; Political, social, economic and religious life of the India Valley People.
4. The Indo-Aryans: Original home and settlement in Punjab, Social, Religious and Economic life during the *Rig* Vedic Age, Social, Religious and Economic life during later Vedic Age.
5. Teaching and impact of Buddhism and Jainism in the Punjab.
6. Alexandar's invasion and its impact.
7. Punjab under Chandragupta Maurya and Ashoka.
8. The Kushans and their contribution to the Punjab.
9. The Panjab under the Gupta Emperor.
10. The Punjab under the Vardhana Emperors.

11. The Punjab from 7th Century to 1000 A.D. (A Survey of Political and Socio-cultural History of Punjab.
12. Development of Art and Architecture of Punjab.

Suggested Readings

1. L.M. Joshi (ed) : History and Culture of the Punjab, Art-I, Patiala, 1989 (3rd edition)
2. L.M. Joshi and Fauja Singh (ed); History of Punjab, Vol. I, Patiala, 1977.
3. Budha Prakash : Glimpses of Ancient Punjab, Patiala, 1983.
4. B.N. Sharma : Life in Northern India, Delhi, 1966.

pj`bl (iel kitv)

prc`-e

sm~ : 3 Gt kl Ek : 100

p`T-km Eq p`T-psqk~

1. **sKn d srj** (E`Dink pj`bl k`iv sgih : 1901-1995) (sp`. f`. bljlq kr Eq f`. tl.fl. jSl) 40 Ek
   gr n`nk dv wnlvristl, Eimqsr, 2007.
2. **pivqr p`pl** (n`nk isG), n`nk isG psqkm`l`, Eimqsr| 30 Ek
3. **E`Dink iek~gl** : (sp. rSn l`l E`hj` Eq mnjlqp`l kr), gr n`nk dv wnlvristl, Eimqsr, 2007. 30 Ek

Ek-vf Eq prliK Ek lel hd`ieq~

1. **sKn d srj** (E`Dink pj`bl k`iv sgih : 1901-1995)
   (a) psg sihq ivE`iKE` (c`r ivcl d) 10+10=20 Ek
   (E) iks iek kivq` d` ivS` vsq, kvl b`r j`xk`rl q asd` wgd`n (d ivcl iek) 10 Ek
   (e) mltlpl cx pSn 5x2=10 Ek
2. **pivqr p`pl**
   n`vl d` ivS-vsq/kQ`nk/p`qr (d ivcl iek) 20 Ek
3. **E`Dink iek~gl**
   iks iek iek~gl d` ivS`-vsq/kl`/iek~gl lKk b`r j`xk`rl q asd` wgd`n (d ivcl iek) 20 Ek
4. aprkq pj`bl n`vl Eq iek~gl sgih ivcl p`T E`D`irq sKp a#qr~ v`l pSn (C ivcl c`r) 4x5=20 Ek

pj`bl (iel kitv)

prc`-bl

sm~ : 3 Gt **k l Ek : 100**

p`T-km Eq p`T-psqk~

1. ਪੰਜਾਬੀ ਸਾਹਿਤ ਦਾ ਇਤਿਹਾਸ (1901–1995)
   (ਡਾ. ਜਸਵਿੰਦਰ ਸਿੰਘ ਤੇ ਡਾ. ਮਾਨ ਸਿੰਘ ਢੀਂਡਸਾ), ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 1998.
2. (ੳ) ਘਰੇਲੂ ਚਿੱਠੀ ਪੱਤਰ
   (ਅ) ਭਾਰਤੀ ਕਾਵਿ ਸ਼ਾਸਤਰ ਨਾਲ ਸੰਬੰਧਿਤ 10 ਮੂਲ ਸੰਕਲਪ : ਅਭਿਧਾ ਲਕਸ਼ਣਾ, ਵਿਅੰਜਨਾ, ਰੂਪਕ, ਉਪਮਾ, ਔਚਿਤਯ, ਵਕ੍ਰੋਕਤੀ, ਸਾਧਾਰਨੀਕਰਣ ਰਸ, ਅਲੰਕਾਰ
3. (ੳ) ਨਜ਼ਮ, ਗੀਤ, ਗ਼ਜ਼ਲ, ਰੁਬਾਈ, ਖੁੱਲ੍ਹੀ ਕਵਿਤਾ
   (ਅ) ਸਾਹਿਤ ਰੂਪ : ਨਾਵਲ, ਇਕਾਂਗੀ, ਨਾਟਕ
4. ਵਿਆਕਰਣ : ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹ, ਸ਼ਬਦ-ਜੋੜ, ਵਾਕ ਸੋਧ, ਬਹੁ-ਅਰਥਕ ਸ਼ਬਦ, ਸਮਾਨਾਰਥਕ ਤੇ ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ।

Ek-vf Eq prliKEk lel hd`ieq~

1. ਪੰਜਾਬੀ ਸਾਹਿਤ ਦਾ ਇਤਿਹਾਸ (1901–1995)
   (ੳ) ਸਾਹਿਤਕ ਧਾਰਾਵਾਂ ਅਤੇ ਪ੍ਰਵਿਰਤੀਆਂ।
   (ਅ) ਸਾਹਿਤਕ ਰੂਪਾਂ ਦੇ ਸਮੁੱਚੇ ਵਿਕਾਸ ਬਾਰੇ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
   (ਵਿਅਕਤੀਗਤ ਸਾਹਿਤਕਾਰ ਸੰਬੰਧੀ ਪ੍ਰਸ਼ਨ ਨਹੀਂ ਪੁੱਛਿਆ ਜਾਵੇਗਾ)
   (ੳ) ਤੇ (ਅ) ਦੋਹਾਂ ਭਾਗਾਂ ਵਿਚੋਂ ਦੋ-ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ, ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਪਰੀਖਿਆਰਥੀਆਂ ਨੇ ਇਕ-ਇਕ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨਾ ਹੋਵੇਗਾ।
   20+20=40 ਅੰਕ
2. (ੳ) ਘਰੇਲੂ ਚਿੱਠੀ ਪੱਤਰ (ਦੋ ਵਿਚੋਂ ਇਕ) 10 ਅੰਕ
   (ਅ) ਭਾਰਤੀ ਕਾਵਿ-ਸ਼ਾਸਤਰ ਨਾਲ ਸੰਬੰਧਿਤ 10 ਮੂਲ ਸੰਕਲਪ (ਚਾਰ ਵਿਚੋਂ ਦੋ) 5+5=10 ਅੰਕ
3. (ੳ) ਪਰਿਭਾਸ਼ਾ ਤੇ ਲੱਛਣ ਉਦਾਹਰਣ ਸਹਿਤ (ਦੋ ਵਿਚੋਂ ਇਕ) 10 ਅੰਕ
   (ਅ) ਪਰਿਭਾਸ਼ਾ, ਪ੍ਰਕਿਰਤੀ ਤੇ ਤੱਤ (ਦੋ ਵਿਚੋਂ ਇਕ) 10 ਅੰਕ
4. ਵਿਆਕਰਣ : ਪੰਜ-ਪੰਜ ਅੰਕਾਂ ਦੇ ਚਾਰ ਵਿਸ਼ਲੇਸ਼ਨਾਤਮਕ ਪ੍ਰਸ਼ਨ।
   4x5=20 ਅੰਕ

pk`rjl (PkSnl) pj`bl

pwjn :

1. pj`bl B`S` d ac`rn Eq ilKq n`l mFll j`x-pC`x|
2. ac`rn Eq iLKq d` EiBE`s

p`T km

prc` - e (iQarl)

sm~ : 2 Gt **kl Ek : 50**

1. ac`rn E|g~ dl bxqr Eq k`rj, DnlE~ d` vrglkrn-sr, ivEjn, EKf DnlE~, ac`r Kf| pj`bl sr, ivEjn~ q sr~ d ac`rn q vrq| d nm| 20 Ek
2. grmKl ErQgr`Pl : ErQgr`Pl d qq; grmKl ErQgr`Pl d nm; pj`bl ac`rn q grmKl ilpl| 15 Ek
3. Eqr-r`Strl Dnl ilpl : mFll j`x-pC`x q vrq| pj`bl ac`rn n Eqr-r`Strl Dnl ilpl Eq grmKl ivc ilKx d 20-20 sqr~ d 10-10 EiBE`s| 15 Ek

pk`rjl (PkSnl) pj`bl
prc`-e (pktlkl)

sm~ : 2 Gt kl Ek : 50

ividE`rQlE~ n pj`bl d` ac`rn krn lel vf pDr 'q EiBE`s krv`e j`xg| ieh EiBE`s d qr~ d hxg :

1. a"cl E`v`z ivc ilKq n pVn d` EiBE`s|
2. zb`nl blx d` EiBE`s|
   (a) w`d Skql d E`D`r 'q zb`nl blx d` EiBE`s|
   (E) ibn~ iqE`rl q iks Gtn`, Kbr, siQql, idS j~ ivEkql b`r miKk vrxn|
3. pktlkl prc ivc ividE`rQl dl pj`bl ac`rn dl smrQ` dl miKk prliKE` lel j`vgl|

pk`rjl (PkSnl) pj`bl
prc`-bl (iQa rl)
p`T-km

sm~ : 2 Gt kl Ek : 50

1. ps`rx d mFl inwm 10 Ek
2. rflA-sc`r d m`iDEm vjl 10 Ek
3. tl.vl. sc`r d m`iDEm vjl 10 Ek
4. B`rq ivc tl.vl. ntvrk Eq ies dl Ek`dimk izmv`rl 10 Ek
5. ps`rx sc`r Eq sm`j 10 Ek

pk`rjl (PkSnl) pj`bl
prc`-bl (pktlkl)

sm~ : 2 Gt kl Ek : 50

Kqrl k`rj

1. rflA Eq tl.vl. stSn 'q mk aq j` k siQql sbDl j`xk`rl p`pq krnl|
2. E`v`z isKl`el

pj`bl dl vrql sm`jk siQqlE~ ivc

1. SB sdS, Sk sdS, bk, f`kK`n, rlv stSn, bs Ef`, hv`el Ef 'q pCigC krnl, slt bk krv`axl E`id|
2. ivE`h sm`gm~ ivc Eq injl pDr a#q p`hixE~ n jl E`ieE~ kihx` Eq ivd` krn`|
3. htl, rstrlt ivc K`x lel E`dS krn`, kmr` bk krv`ax`|

pktlkl q Kqrl k`rj

vK vK Q`v~ 'q j`x` q vK vK siQqlE~ ivc glb`q lel isKl`el dx`|

SANSKRIT (Elective)

Paper—A (गद्य एवं काव्य)

(Teaching—Six Periods per week)

Time : 3 Hours **Max.Marks : 100**

प्रश्नप्रत्र का माध्यम हिन्दी होगा। उत्तर संस्कृत/हिन्दी/पंजाबी/अंग्रेजी में हो सकते हैं।

I. निर्धारित पाठ्यक्रम :

1. पंचतन्त्र (अपरीक्षितकारक) संस्कृत ग्रन्थागार दिल्ली (2004) ... 50 अंक
2. **नीतिशतक (भर्तुहरि)** (1—50 श्लोक) ... 50 अंक

II. प्रश्न—पत्र निर्माण निर्देश :

प्रश्न—पत्र के 3 भाग होंगे—

प्रथम भाग—20 अंक

द्वितीय भाग—50 अंक

तृतीय भाग—30 अंक

1. प्रथम भाग :

इस में पंचतन्त्र (अपरीक्षितकारक) तथा नीतिशतक से 10 प्रश्न अति संक्षिप्त उत्तरों के लिये पूछे जायेंगे। प्रत्येक प्रश्न के 2 अंक हैं।

(10x2=20)

2. द्वितीय भाग :

(क) **पंचतन्त्र (अपरीक्षितकारक)** में से 6 पद्य देकर 3 का सप्रसंग सरलार्थ पूछा जाये। प्रत्येक पद्य के लिये 6 अंक निर्धारित हैं। (3x6=18)

(ख) **पंचतन्त्र (अपरीक्षितकारक)** में से 4 सूक्तियां देकर 2 की सप्रसंग व्याख्या पूछी जाये। प्रत्येक के 6 अंक हैं। (2x6=12)

(ग) नितिशतक से 6 पद्य देकर 3 का सप्रसंग सरलार्थ पूछा जाये। प्रत्येक के 6 अंक हैं। (3x6=18)

(घ) नितिशतक से 4 सूक्तियां देकर 2 की सप्रसंग व्याख्या पूछी जाये। प्रत्येक के 6 अंक हैं। (2x6=12)

3. तृतीय भाग :

(क) **पंचतन्त्र (अपरीक्षितकारक)** में से 2 कथाएं देकर किसी एक कथा को शिक्षा सहित लिखने के लिए कहा जाए। इसके 10 अंक हैं।

(ख) नीतिशितक से 2 प्रश्न देकर एक का उत्तर पूछा जाये। इसके 10 अंक हैं।

III. नोटः—तृतीय भाग के लिए सम्भावित बिन्दु :

1. **पंचतन्त्र (अपरीक्षितकारक)**

(क) कथासार (ख) कथा की शिक्षा (ग) कथा का महत्व इत्यादि।

2. नीतिशतक

(क) विविध प्रति पाद्य विषय। (ख) शिक्षाओं का सार (ग) अन्योक्तियां (घ) सार्वभौम सूक्तियों का परिचय (ङ) शैली (च) मुक्तक काव्य की परिभाषा एवं नीतिशतक ....इत्यादि।

Sanskrit (Elective)

Paper—B (व्याकरण तथा अनुवाद)

(Teaching—Six periods per week)

Time : 3 Hours **Max.Marks : 100**

प्रश्न–प्रत्र का माध्यम हिन्दी होगा। उत्तर संस्कृत/हिन्दी/पंजाबी/अंग्रेजी में हो सकते हैं।

I. निर्धारित पाठ्यक्रम :

1. वर्णो का उच्चारण स्थान 4 अंक
2. स्वर सन्धि 10 अंक
3. शब्द रूप 20 अंक
   (क) राम, हरि, पति, साधु, पितृ, फल, वारि, लता, नदी, मातृ, राजन्, संख्यावाचक शब्द – एक, द्वि, त्रि, चतुर (तीनों लिंगों में)।
4. **संख्यावाची शब्द** 10 अंक
   (क) 1 से 100 तक संस्कृत में संख्या।
5. **धातुरूप (लट्, लोट, लृट्, लङ्, विधिलिङ् लकारों में)** 20 अंक
   (क) भ्वादिगण–भू, पठ्, हस्, लिख्, वद्, गम्, पत्, दृश्, स्मृ, पच्।
   (ख) अदादिगण–अस।
   (ग) जुहोत्यादिगण– दा।
   (घ) दिवादिगण–दिव्, नृत्, नश्।
   (ङ) स्वादिगण–शक्, श्रु।
   (च) तनादिगण–कृ
6. **कारक (केवल सामान्य स्तर के नियम)** 10 अंक
7. **अव्ययों का वाक्य में प्रयोग** 6 अंक
   कुत्र, यत्र, तत्र, सर्वत्र, एकत्र, पश्चात्,
   च, खलु, चिरम्, ननु, पुनः, ह्यः,
   श्वः, परश्वः, सदा, सर्वदा, कहा, यदा,
   तदा, यथा, तथा, एवम्, एव, न अपि, अधुना, चित्।

8. **कृत् प्रत्यय (कृदन्त शब्द निर्माण)** 10 अंक
क्त, क्तवतु, क्त्वा, ल्यप् तव्यत्, अनीयर्, तुमुन, शतृ, शानच् प्रत्ययों का पाठ्यक्रम में निर्धारित धातुओं के साथ योग।

9. **संस्कृत में अनुवाद** 10 अंक

II. प्रश्न–पत्र निर्माण निर्देश:

प्रश्न–प्रत्र के 3 भाग होंगे–

प्रथम भाग	–	20 अंक
द्वितीय भाग	–	60 अंक
तृतीय भाग	–	20 अंक

1. प्रथम भाग:

इसमें 'वर्णों का उच्चारण स्थान' से 2 प्रश्न, 'अव्ययों का वाक्य में प्रयोग' से 3 प्रश्न तथा 'स्वर सन्धि' से 5 प्रश्न अर्थात् कुल 10 प्रश्न पूछे जायें। प्रत्येक के 2 अंक हैं।

10x2=20

2. द्वितीय भाग:

(क) 8 शब्द देकर 4 के रूप पूछे जाएं। प्रत्येक के 5 अंक होंगे। 4x5=20

(ख) 8 धुात देकर 4 के रूप लिखने के लिए कहा जाए। प्रत्येक धातु के रूपों के लिए 5 अंक हैं। 4x5=20

(ग) 10 धातुओं के साथ प्रत्यय देकर 5 के कृदन्त शब्द लिखवाये जायें। प्रत्येक कृदन्त शब्द के 2 अंक होंगे। 5x2=10

(घ) (i) 1 से 100 तक संख्याओं में से 10 संख्यायें देकर 5 के संस्कृत शब्द पूछे जायें। प्रत्येक के लिये एक अंक निर्धारित है। 5x1=5

(ii) एक, द्वि, त्रि, चतुर, में से दो शब्द देकर किसी एक शब्द के रूप सभी विभक्तियों में पूछे जायें। इसके 5 अंक हैं। 1x5=5

3. तृतीय भाग:

(क) कारकों के सामान्य स्तर के नियमों को ध्यान में रखते हुए संस्कृत के 10 अशुद्ध वाक्य देकर 5 का अशुद्धि संशोधन करवाया जाये। प्रत्येक के 2 अंक होंगे।

5x2=10

(ख) पाठ्यक्रम में निर्धारित शब्द, धातु, अव्यय, प्रत्यय आदि को ध्यान में रखकर 10 हिन्दी वाक्य देते हुए 5 का संस्कृत में अनुवाद करने के लिए कहा जाये। प्रत्येक वाक्य 2 अंक का होगा। 5x2=10

Functional Sanskrit (Vocational)

Paper-A

Time : 3 Hours **Max. Marks : 100**

Note : Paper will have 3 Sections i.e. Section A, B & C.

Section-A

In this Section 10 questions of 2 marks each will be asked. All questions will be compulsory with a total weightage of 20 marks.

Section-B

In this Section 12 questions will be asked. Candidates will have to attempt 8 questions carrying 6 marks each with a total weightage of 48 marks.

Section-C

In this Section 4 questions will be asked. Candidates will have to attempt 2 questions. Each question will carry 16 marks with a total weightage of 32 marks.

प्रश्न पत्र प्रथम

1. भारतीय संस्कृते : स्थुल परिचय
2. भारतीय संस्कृते : ग्राधाणि तत्वानि
3. धार्मिक विविधना उद्‌देश्या : प्रयोजनानिय
4. सन्या वन्दनामू
5. प्रणायाम विधि
6. नितहिकाविविध विधनानि
7. सामान्यदेव पूजा विधि
8. घोडशोपचार विधि
9. विशिषट देवपूजा विधि
10. विविध देवतासहत्रना भानि

Functional Sanskrit (Vocational)

Paper-B

Time : 3 Hours **Max. Marks : 100**

Theory : 84

Practical : 16

Note : Question Paper will be divided into Three sections :

Section-A

In this Section 10 questions of 2 marks each will be asked. All questions will be compulsory with a total weightage of 20 marks.

Section-B

In this Section 12 questions will be asked. Candidates will have to attempt 8 questions carrying 6 marks each with a total weightage of 48 marks.

Section-C

In this Section 4 questions will be asked. Candidates will have to attempt 2 questions. Each question will carry 8 marks with a total weightage of 16 marks.

1. पंचांग परिचय
2. ज्योति : शास्त्र परिचय
3. जातक रचनाप्रकाशक
4. प्रषयाहवायनम्
5. शान्ति होगा
6. चेवदमजपबे
7. षोडष संस्काराणा सामान्य परिचय
8. संस्काराणाम् उददे्शा प्रयोजनंच
9. गर्भधानम्
10. प्रंसवनम्
11. वर्जाश्रमवययवस्थाया : परिचय

हिन्दी पेपर ए

आधुनिक कविता अनुवाद व्याकरण

समय : 3 घन्टे **कुल अंक : 100**

नोट : यह प्रश्न–पत्र तीन भागों में विभक्त होगा।

खण्ड–एक

इस भाग में से 10 प्रश्न पूछे जाएंगे। इस का पांच पंक्तियों में उत्तर देना होगा। इस भाग के सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न दो अंकों का है। कुल अंक 20 हैं।

खण्ड–दो

इस भाग में 12 प्रश्न पूछे जाएंगे जिन में से 8 प्रश्नों का उत्तर देना अनिवार्य होगा। प्रत्येक प्रश्न का उत्तर दो पृष्ठों तक सीमित होगा। प्रत्येक प्रश्न के छः अंक हैं। कुल अंक 48 हैं।

खण्ड–तीन

इस भाग में 4 प्रश्न पूछे जाएंगे जिन में से दो प्रश्नों का उत्तर देना अनिवार्य है। प्रत्येक प्रश्न का उत्तर पांच पृष्ठों का होगा। प्रत्येक प्रश्न सोलह अंकों का होगा।

कुल अंक 32 हैं।

निर्धारित पाठ्यक्रम

पाठ्य पुस्तकें

1. काव्य पथ : संपादक–डॉ. सुधा जितेन्द्र, प्रकाशक गुरु नानक देव यूनिवर्सिटी, अमृतसर के पहले 12 कवि रखे गए हैं।
2. आदर्श हिंदी व्याकरण तथा सैद्धांतिकी : डॉ. एच.एम.एल. सूद, वागीश प्रकाशन, जालंधर।
   (क) सैद्धांतिक व्याकरण – संज्ञा, सर्वनाम, विशेषण, क्रिया, उपसर्ग, प्रत्यय।
   (ख) व्यावहारिक व्याकरण – विपरीतार्थक तथा समानार्थक, अनेक शब्दों के लिए एक शब्द, शब्द युग्म।
   (ग) अशुद्धि शोधन
3. अनुवाद : अवधारणा स्वरुप और उपयोगिता

विषयानुकूल अंक विभाजन

1. प्रथम खण्ड में व्याकरण, तथा पाठ्य पुस्तक में निर्धारित कवियों तथा उनकी कविताओं में से प्रश्न समान अनुपात से पूछे जायेंगे।

2. दूसरे खण्ड में चार सप्रसंग व्याख्याएं होंगी जिनमें से दो करनी होंगी। चार प्रश्न कवि परिचय एवं कविताओं के होंगे, उनमें से दो प्रश्न करने अनिवार्य होंगे। दो प्रश्न व्याकरण के तथा दो प्रश्न अनुवाद के होंगे। जिनमें से एक एक करना अनिवार्य होगा।
3. तीसरे खण्ड में निर्धारित कविताओं के काव्य–मूल्यांकन तथा निर्धारित कविताओं सम्बन्धी विस्तृत प्रश्न होंगे।
4. व्याकरणांश के लिए प्राश्निक निर्धारित पाठ्य पुस्तक 'आदर्श हिंदी व्याकरण तथा सैद्धांतिकी' से ही प्रश्न पूछेंगे।

पेपर बी

गद्य साहित्य,सैद्धांतिकी तथा पत्रकारिता

समय : 3 घन्टे **कुल अंक : 100**

नोट : यह प्रश्न–पत्र तीन भागों में विभक्त होगा।

खण्ड–एक

इस भाग में से 10 प्रश्न पूछे जाएंगे। इस का पांच पंक्तियों में उत्तर देना होगा। इस भाग के सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न दो अंकों का है। कुल अंक 20 हैं।

खण्ड–दो

इस भाग में से 12 प्रश्न पूछे जाएंगे जिन में से 8 प्रश्नों का उत्तर देना अनिवार्य होगा। प्रत्येक प्रश्न का उत्तर दो पृष्ठों तक सीमित होगा। प्रत्येक प्रश्न के छः अंक हैं। कुल अंक 48 हैं।

खण्ड–तीन

इस भाग में चार प्रश्न पूछे जाएंगे जिन में से दो प्रश्नों का उत्तर देना अनिवार्य है। प्रत्येक प्रश्न का उत्तर पांच पृष्ठों का होगा। प्रत्येक प्रश्न सोलह अंकों का होगा। कुल अंक 32 हैं।

निर्धारित पाठ पुस्तकें

गद्य–त्रयी : सम्पादक डॉ. मधु संधु : प्रकाशक, गुरु नानक देव यूनिवर्सिटी, अमृतसर।

आदर्श हिंदी व्याकरण और सैद्धांतिकी : डॉ. एच.एम. लाल सूद, वागीश प्रकाशन, जालंधर। सैद्धान्तिकी : निबन्ध, कहानी, एकांकी, परिभाषा स्वरुप, तत्व प्रकार पत्रकारिता : अवधारणा तथा स्वरुप।

विषयानुकूल अंक विभाजन

1. प्रथम खण्ड में पाठ्य पुस्तक तथा सैद्धांतिकी से समान अनुपात से प्रश्न पूछे जायेंगे।
2. दूसरे ख्ण्ड में कहानियों तथा निबंधों से दो–दो व्याख्याएं पूछी जायेंगी जिनमें से एक–एक करनी अनिवार्य होंगी। शेष में तीन प्रश्न सैद्धान्तिकी तथा तीन प्रश्न पाठ्य पुस्तक से तथा दो प्रश्न पत्रकारिता से पूछे जायेंगे। प्रत्येक क्षेत्र में से कम से कम एक प्रश्न का उत्तर देना अनिवार्य होगा।
3. तीसरे खण्ड में दो प्रश्न पाठ्य पुस्तक तथा दो सैद्धान्तिक समीक्षा से पूछे जायेंगे और उनमें से एक–एक प्रश्न करना अनिवार्य होगा।

फंक्शनल हिन्दी

पेपर–एक

भारत सरकार की राजभाषा नीति, प्रयोगात्मक, संवादात्मक हिन्दी और आदिकालीन हिन्दी साहित्य का विशेष संदर्भ

समय : तीन घण्टे **पूर्णांक : 100**

क) यह प्रश्नपत्र तीन भागों में बंटा हुआ है। पहले भाग में से दस प्रश्न पूछे जाएंगे। इस भाग के सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न 2 अंकों का है। कुल अंक 20 हैं।

ख) इस भाग में बारह प्रश्न पूछे जाएंगे जिनमें से आठ प्रश्नों का उत्तर देना है। इन प्रश्नों का उत्तर दो पृष्ठों तक की सीमा का होगा। प्रत्येक प्रश्न के छः अंक हैं। कुल अंक 48 हैं।

ग) इस भाग में चार प्रश्न पूछे जाएंगे जिनमें से 2 प्रश्नों का उत्तर देना अनिवार्य है। इन प्रश्नों का उत्तर पांच पृष्ठों तक सीमित होगा। प्रत्येक प्रश्न के 16 अंक हैं। कुल अंक 32 हैं।

निर्धारित पाठ्यक्रम

(क) भारत सरकार की राजभाषा नीति

सिद्धान्त :

- राजभाषा
- राजभाषा हिन्दी को लागू करने सम्बन्धित संवैधानिक प्रावधान (अधिनियम–343)
- राजभाषा अधिनियम–1963 और उसके 1976 में बनाए गए नियम।
- राजभाषा का आदेश–1960
- राजभाषा संकल्प (Resolution), 1968.
- राजभाषा हिन्दी : कार्यान्वयन समितियां
- हिन्दी प्रशिक्षण (Training) और प्रोत्साहन (Incentives)

(ख) हिन्दी का प्रयोगात्मक व्याकरण और संवादात्मक हिन्दी

सिद्धान्त :

- हिन्दी भाषा का स्वरूप
- वाक्य संरचना सम्बन्धी नियम
- लिंग, वचन, क्रिया, विशेषण का सामान्य परिचय उपसर्ग, प्रत्यय का व्याव्हारिक पक्ष।
- स्वन प्रक्रिया (Phonology) अक्षर (Syllable) बलघात (Accent) और सम्पर्क/एक और सूत्रीय भाषा (Connected Speech), लयात्मकता (Rhythm) और अनुतान (Intovation)
- विविध स्थितियों में हिन्दी का प्रयोगात्मक रूप

(ग) **हिन्दी साहित्य का संदर्भ**

– हिन्दी साहित्य के आदिकाल की विशेषताएं, परिस्थितियाँ, नामकरण, रासो–काव्य परम्परा, रासो ग्रन्थों की प्रामाणिकता और अप्रामाणिकता।

(घ) **प्रयोग**

– शब्दों और वाक्यों की सामान्य अशुद्धियों को शुद्ध करने का अभ्यास

– बलाघात (Accent) और अनुतान (Intovation) का अध्ययन

– विभिन्न स्थानों पर जा कर हिन्दी का विविध स्थितियों में अध्ययन और वास्तविक स्थिति में वार्तालाप का अभ्यास

– राष्ट्रीयकृत बैंकों/पब्लिक सैक्टर/अंडरटेकिंग्स/कार्पोरेशंस और कम्पनियों में हिन्दी में प्रयुक्त होने वाले अंकड़े एकत्रित कर त्रैमासिक रिर्पोट तैयार करना।

अंक–विभाजन

– प्रथम खण्ड में शब्दों तथा वाक्यों की 10 अशुद्धियां शुद्ध करनी होंगी। 2x10=20

– द्वितीय खण्ड में 3 प्रश्न अधिनियम 343, 1960, 1963, 1968, 1976, तीन प्रश्न लिंग, वचन, क्रिया, विशेषण, उपसर्ग, प्रत्यय, अक्षर, बलाघात, सम्पर्क एक सूत्रीय भाषा, लयात्मकता, अनुतान तथा 2 प्रश्न हिन्दी साहित्य के आदिकाल में से करने होंगे। 6x8=48

– तृतीय खंड में एक प्रश्न राजभाषा हिन्दी, कार्यन्वयन समितियां, हिन्दी प्रशिक्षण और प्रोत्साहन, हिन्दी का स्वरूप, वाक्य संरचना सम्बन्धी नियम विविध स्थितियों में हिन्दी का प्रयोगात्मक रूप तथा एक प्रश्न हिन्दी साहित्य के आदिकाल में से पूछा जाएगा। 2x16=32

फंकशनल हिन्दी

पेपर–दो

प्रशासनिक पत्राचार और अनुवाद

समय : 3 घंटे **पूर्णांक : 100**

क) यह प्रश्न पत्र तीन भागों में बंटा हुआ है। पहले भाग में से दस प्रश्न पूछे जाएंगे। इस भाग के सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न 2 अंकों का है। कुल अंक 20 हैं।

ख) इस भाग में बारह प्रश्न पूछे जाएंगे जिनमें से आठ प्रश्नों का उत्तर देना है। इन प्रश्नों का उत्तर दो पृष्ठों तक की सीमा का होगा। प्रत्येक प्रश्न के 6 अंक हैं। कुल अंक 48 हैं।

ग) इस भाग में चार प्रश्न पूछे जाएंगे जिनमें से दो प्रश्नों का उत्तर देना अनिवार्य है। इन प्रश्नों का उत्तर पांच पृष्ठों तक सीमित होगा। प्रत्येक प्रश्न के 16 अंक हैं। कुल अंक 32 हैं।

निर्धारित पाठ्यक्रम

सिद्धान्त

क) प्रयोजनमूलक हिन्दी

– प्रयोजनमूलक हिन्दी : अभिप्राय, परिभाषा और स्वरूप

– प्रयोजनमूलक हिन्दी : आवश्यकता और विशेषताएँ

ख) प्रशासनिक पत्राचार

मूलरूप में पत्र लिखना (Originating letter), पत्र का उत्तर देना (Reply to letter), पावती (Acknowledgement), स्मारक/स्मरण पत्र (Reminder), अर्धसरकारी पत्र (Semi-official leter), परिपत्र (Circular), आदेश (Order), पृष्ठांकन (Endorsement), अन्तर्विभागीय टिप्पणी (Inter-Department Notes), स्तरीय प्रारूप (Standard Drafts), निविदा (Tenders), सूचनाएं (Notices), रिक्त स्थानों के लिए विज्ञापन (Advertisement for Vacancies), प्रैस विज्ञप्ति (Press Communiques), प्रतिवेदन (Reports)

(ख) अनुवाद, शब्दावली और वाक्य–वाक्यांश

सिद्धान्त

– अनुवाद : अवधारणा, स्वरूप, क्षेत्र, संभावनाएं, सीमाएं और समस्याएं।

– अनुवाद प्रकार

- कार्यालयीन पत्रों का अनुवाद : स्मरण पत्र (Reminder), पावती (Acknowledgement), प्रतिवेदन (Report), कार्यसूची (Agenda), टिप्पणी (Minutes), बैठक की कार्यवाही (Proceedings of the Minutes)
- बैंक, रेलवे, हवाई अड्डा, डाकतार विभाग में प्रयुक्त की जाने वाली पारिभाषिक शब्दावली, वाक्य और वाक्यांश।
- शब्दावली निर्माण के नियम।

प्रयोग

- केस (प्रकरण) पर प्रारूप पत्र (Draft letters) तैयार करना।
- बैंक, रेलवे, हवाई अड्डा, डाकतार शब्दावली का अनुवाद (विद्यार्थी और प्राध्यापक द्वारा आपस में निर्णित किसी एक क्षेत्र से सम्बन्धित शब्दावली के 250 पारिभाषिक पुस्तिका जमा करना)।

अंक–विभाजन

- प्रथम खण्ड (क) में बैंक, रेलवे, हवाई अड्डा, डाक तार विभाग में प्रयुक्त होने वाली शब्दावली, वाक्य–वाक्यांश का अंग्रेजी से हिन्दी तथा हिन्दी से अंग्रेजी अनुवाद करना होगा। कुल 10 प्रश्न करने होंगे। अंक 2x10=20
- द्वितीय खण्ड (ख) में 2 प्रश्न प्रयोजनमूलक हिन्दी, 5 प्रश्न प्रशासनिक पत्राचार और 1 प्रश्न पत्रों का अंग्रेजी से हिन्दी–अनुवाद में से करना होगा।
  अंक 6x8=48
- तृतीय खण्ड (ग) में अनुवाद : अवधारणा, स्वरूप, क्षेत्र, संभावनाएँ, सीमाएं, समस्याएं, अनुवाद के प्रकार तथा शब्दावली निर्माण के नियमों पर 2 प्रश्न करने होंगे।
  अंक 2x16=32

नोट : पाठ्यक्रम में निर्धारित शब्दावली संलग्न है।

फंकशनल हिन्दी

निर्धारित शब्दावली

बैंकिंग शब्दावली

1.	Ability to Invest	निवेश सामर्थ्य
2.	Acceptance Credit	ऋण साख स्वीकृति
3.	Acceptor	सकारी
4.	Accounts, Debt	ऋण लेखा/खाता
5.	Accredited	प्रत्यायित
6.	Accreditee	उधार पत्र
7.	Accrued	उपाचित
8.	Advance	अग्रिम
9.	Agio	बट्टा
10.	Allotment of debentures	डिबेंचरों का नियतन
11.	Amortisation payments	ऋण–परिशोधन अदायगियां
12.	Amount claimed	दावे की राशि
13.	Assuser	बीमाकर्ता आश्वासक
14.	At par	सममूल्य पर
15.	At variance with	से भिन्न
16.	Back data	पिछले/पूर्व आंकड़े
17.	Bad debt	अशोध्य ऋण
18.	Balance Book	शेष बही
19.	Balance due	देय/प्राप्त शेष राशि
20.	Balance of trade	व्यापार संतुलन
21.	Balance	रोकड़ जमा
22.	Bank, Apex	शिखर बैंक
23.	Bank bill	बैंक हुंडी
24.	Bank cash	बैंक रोकड़

25.	Bank Credit	बैंक साख
26.	Bank Debit	बैंक नामे
27.	Black list	काली सूची
28.	Bring forward	आगे लाना
29.	Capita, per	प्रति व्यक्ति
30.	Capital loss	पूंजीगत हानि
31.	Capitalisation	पूंजीकरण
32.	Case study	वृत्त अध्ययन
33.	Cheque, Bearer	वाहक चेक
34.	Coin, Base	हीन मूल्य सिक्का
35.	Consignee	परेषिती
36.	Credit Balance	जमा शेष
37.	Daily Balance	दैनिक शेष
38.	Exchange, Stable	स्थिर, विनियम दर
39.	Goodwill	साख/सुनाम
40.	House, Clearing	समाशोधन गृह
41.	Issue	अवनिर्गम
42.	Key-word	सूचक शब्द
43.	Know-how	तकनीकी जानकारी
44.	Life fund	आजीवन विधि
45.	Loan	ऋण
46.	Long term rate	दीर्घावधि दर
47.	Market, Firm	दृढ़/मजबूत बाजार
48.	Tax base	कर आधार
49.	Year, Accounting	लेखा वर्ष
50.	Wage	मजदूरी

हिन्दी से अंग्रेजी
बैंकिंग शब्दावली

1.	कार्य लागत	Work cost
2.	मूल्य देय	Value payable
3.	व्यापार चिन्ह	Trade Mark
4.	समयबद्ध	Time bound
5.	बचत का बजट	Surplus budget
6.	विक्रय स्थल	Selling point
7.	सतत प्रतिभूति	Security continuing
8.	अग्रिम लेखा	Advance account
9.	सूचना पुस्तक	Advice Book
10.	स्थायी परिसम्पतियां	Assets
11.	शेष राशि	Balance in hand
12.	लाभ शेष	Balance of profit
13.	बैंकिंग पूंजी	Banking capital
14.	बैंकिंग निति	Banking policy
15.	वाहक/धारक	Bearer
16.	खाता जमा	Book deposit
17.	परिकलन	Calculation
18.	नकद बाजार	Cash market
19.	भुनाया गया चेक	Cheque cashed
20.	वसूली प्रभार	Collection charges
21.	ऋण अंतराल	Credit gap
22.	चालू खाता	Current account
23.	नामे बाकी	Debit balance
24.	गिरती कीमतें	Declining price
25.	मांग पत्र	Demand note

26.	मूल्य ह्रास	Depreciation
27.	आर्थिक मंदी	Economic depression
28.	अंकित मूल्य	Face value
29.	धन	Money
30.	खाता पन्ना	Folio/Ledger
31.	परेषण माल	Goods on Consignment
32.	ब्याजी	Interest Bearing
33.	संयुक्त बैंक लेखा	Joint Bank account
34.	श्रम लागत	Labour cost
35.	खाता शेष	Ledger Balance
36.	मध्यकालीन ऋण	Loan Medium Term
37.	एकाधिकार बाजार	Market Monopolist
38.	सोने की टकसाल की कीमत	Mint price of gold
39.	बहुविकल्प	Multiple Choice
40.	कटी–फटी हुंडी	Mutilated bill
41.	न हानि न लाभ के आधार पर	No loss no profit base
42.	विकृत नोट	Note, Soiled
43.	ओवर ड्राफट	Over draft
44.	ऊपरी व्यय	Overhead cost
45.	सममूल्य	Per value
46.	प्रति व्यक्ति	Per capita
47.	आजीवन पालिसी	Policy, Whole life
48.	मूल्य रेखा	Price line
49.	मूल्य चक्र	Price cycle

50.	क्रय धन	Purchase Money

रेलवे विभाग की शब्दावली

1.	अवधि टिकट	Season ticket
2.	अमानती सामान घर	Clock room
3.	अर्जित आय	Earned Income
4.	आगमन	Arrival
5.	आमने सामने की टक्कर	Head on Collision
6.	आरक्षण	Reservation
7.	आधा किराया	Half fair
8.	इतर रेलवे	Foreign Railway
9.	उप–मार्ग	By-pass
10.	ऊपरी पुल	Overbridge
11.	अंकित मूल्य	Face Value
12.	कर्मचारी	Staff
13.	कक्ष	Compartment
14.	कार्ड टिकट	Card Ticket
15.	खतरे की जंजीर	Alarm chain
16.	खान–पान	Catering
17.	खुला माल डिब्बा	Open wagon
18.	गलत मार्ग	Wrong route
19.	गाड़ी पटरी पर	Train on line
20.	गार्ड का डिब्बा	Guard's Van
21.	चलती गाड़ी	Running Train
22.	चालू करना	Switching in
23 .	चिटकनी	Bolt
24.	चुंगी	Terminal charges
25.	जलमार्ग	Waterway
26.	टिकट घर	Booking office

27.	टैरिफ	Tariff
28.	डाक गाड़ी	Mail train
29.	डिब्बा	Compartment
30.	ले जाना	Carry
31.	तीर्थयात्री कर	Pilgrim tax
32.	दावा	Claims
33.	दुर्घटना स्थल	Site of accident
34.	दोहरी लाइन	Double line
35.	नियन्त्रक	Controller
36.	निर्देशन	Direction
37.	प्रभार	Charges
38.	प्लेटफार्म टिकट	Platform Ticket
39.	बुक किया मार्ग	Booked route
40.	भारतीय रेल	Indian Railway
41.	माल गाड़ी	Goods Train
42.	यात्रा टिकट	Journey Ticket
43.	रोक दूरी	Brake distance
44.	वातानुकूलित	Air conditioned
45.	वापसी टिकट	Return Ticket
46.	शाखा लाइन	Branch line
47.	साधारण किराया	Ordinary fare
48.	स्लीपर	Sleeper
49.	हाथ ब्रेक	Hand brake
50.	हाथ शंटिंग	Hand shunting

English to Hindi

1.	Dead slow	अत्यन्त धीरे
2.	Over time	अतिरिक्त समय
3.	Seat	आसन

4.	Rest Room	आराम कमरा
5.	Average speed	औसत गति
6.	Points	काँटे
7.	Personnel	कार्मिक
8.	Coach	गद्दी
9.	Detrain	गाड़ी से उतरना या उतारना
10.	Thick fog	घना कोहरा
11.	Charge man	चार्ज मैन
12.	Sort	छांटना
13.	Credit Note	जमा पत्र
14.	Dispute	झगड़ा
15.	Contract	ठेका
16.	Determine	तय करना
17.	Class	दर्जा
18.	Rate	दर
19.	Capacitor	धारक
20.	Lower class	निचला दर्जा
21.	Damages	नुकसानी
22.	Resistance	प्रतिरोध
23.	Tourist	पर्यटक
24.	Package	पैक करना
25.	Replace	बदलना
26.	Obstruction	बाधा
27.	Shorel	बेलचा
28.	Freight	भाड़ा
29.	Despatch	भेजना
30.	Quote	भाव देना

31.	Arch	महराब
32.	Commodity	माल
33.	Quantity	मात्रा
34.	Van	यान
35.	Night shift	रात की पाली
36.	Train	रेलगाड़ी
37.	Detain	रोकना
38.	Return Ticket	वापसी टिकट
39.	Carriage	वाहन
40.	Indicator	संकेतक
41.	Collection	संग्रहण
42.	Stores	सामान
43.	Through Train	सीधी गाड़ी
44.	Stock Rail	स्थिर पटरी
45.	Push trolly	हथ ठेला
46.	Hand Shunting	हाथ शंटिंग
47.	Through Booking	सीधी बुकिंग
48.	Notice	सूचना
49.	Collaboration	सहयोग
50.	Relief train	राहत गाड़ी

डाक तार विभाग में प्रयुक्त होने वाली शब्दावली

1.	Inland air-mail	अंतर्देशीय हवाई डाक
2.	Inland air-mail service	अंतर्देशीय हवाई डाक सेवा
3.	International post	अंतर्राष्ट्रीय डाक
4.	Most immediate call	अति तात्कालिक काल
5.	No delivery	अवितरण, वितरण नहीं
6.	Sectional mail bag	अनुभागीय डाक–थैला
7.	Small saving fund	अध्य बचत निधि

8.	Unclaimed article	अ–दावी वस्तु
9.	Unclaimed money	अ–दावी मनीआर्डर
10.	Emergency call	आपात्काल
11.	Inward land rate	आवक देश दर
12.	Inward mail	आवक डाक
13.	Credit care ticket	उधार काल टिकट
14.	Extension telephone	उपटेलीफोन
15.	Gift coupan	उपहार कूपन
16.	Gift parcel	उपहार पार्सल
17.	Output voltage	उत्पादन वोल्टता
18.	Satelite exchange	उपग्रह–केन्द्र
19.	Sub-post office	उपडाक घर
20.	Cable code	केबिल कोड
21.	Cable fault	केबिल दोष
22.	Cable guard	केबिल रक्षक
23.	Cable house	केबिल घर
24.	Cable terminal box	केबिल टर्मिनल बक्स
25.	Call counting meter	काल गणन मीटर
26.	Code word	कोड शब्द
27.	Duration of call	काल की अवधि
28.	Message in code	कोड भाषा में शब्द
29.	Misdelivery	गल्त डिलिवरी
30.	Microphone	ध्वनिग्राही
31.	Reply postcard	टेलीफोन केन्द्र
32.	Mail agent	डाक ऐजन्ट
33.	Post	डाक से भेजना
34.	Postage	डाक शुल्क

35.	First day cover	प्रथम दिवस आवरण
36.	Call bell	बुलावा घंटी
37.	Call Signal	बुलावा संकेत
38.	Indian postal service	भारतीय डाक सेवा
39.	Meter reading	मीटर पठन
40.	Cash certificate	रोकड़ प्रमाण पत्र
41.	Cash counter	रोकड़ पटल
42.	Short circuit	लघु पथक
43.	Advice of delivery	वितरण सूचना
44.	Dry battery	शुष्क बैटरी
45.	Dry code cable	शुष्क कोड केबल
46.	Army post office	सेना डाक घर
47.	Combined mail	संयुक्त डाक थैला
48.	Message code	संदेश संकेत
49.	Ordinary telegram	साधारण काल
50.	Service post card	सरकारी पोस्टकार्ड

डाक तार विभाग में प्रयुक्त होने वाली शब्दावली

1.	अनामक संदेश	Anonymous Communication
2.	अंतर्देशीय हवाई	Inland air-mail
3.	अंतविष्ठ प्रेषित	Inland letter
4.	अंतर्राष्ट्रीय डाक	International post
5.	अति तात्कालिक काल	Most immediate call
6.	अवितरण, वितरण नहीं	No delivery
7.	अनापित प्रमाण पत्र	Non-Objection certificate
8.	आपतिजनक काल	Obnonious call
9.	अनुभागीय डाक–थैला	Sectional mail bag
10.	अ–दावी वस्तु	Unclaimed article
11.	अ–दावी मनीआर्डर	Unclaimed money

12.	आपातकाल	Emergency call
13.	आवक विदेश पार्सल	Inward foreign parcel
14.	आवक देश दर	Inward land rate
15.	आवक डाक	Inward mail
16.	आवती	Recurring
17.	उधार काल टिकट	Credit call ticket
18.	उप टेलिफोन	Extension telephone
19.	उपहार कूपन	Gift Coupan
20.	उपहार पार्सल	Gift Parcel
21.	उत्पादन वोल्टता	Output Voltage
22.	उपग्रह केन्द्र	Satelite Exchange
23.	उप–डाकघर	Sub-post office
24.	केबिल कोड	Cable Code
25.	केबिल दोष	Cable fault
26.	केबिल रक्षक	Cable guard
27.	केबिल घर	Cable house
28.	केबिल टर्मिनल बक्स	Cable terminal box
29.	काल गणन मीटर	Call counting meter
30.	कोड शब्द	Code word
31.	केन्द्रीय तार घर	Central telegraph office
32.	काल की अवधि	Duration of Call
33.	कोड भाषा में संदेश	Message in Code
34.	गल्त डिलिवरी	Misdelivery
35.	ध्वनिग्राही	Microphone
36.	टेलिफोन केन्द	Reply postcard
37.	डाक ऐजन्ट	Mail agent
38.	डाक थैला	Mail bag

39.	तार पता	Telegraphic address
40.	प्रथम दिवस आवरण	First day Cover
41.	बुलावा घंटी	Call bell
42.	बुलावा संकेत	Call signal
43.	भारतीय डाक सेवा	Indian postal service
44.	मीटर पठन	Meter reading
45.	रोकड़ प्रमाण पत्र	Cash certificate
46.	रोकड़ पटल	Cash counter
47.	लघु पथ	Short circuit
48.	शुष्क बैटरी	Dry battery
49.	सेना डाकघर	Army post office
50.	संयुक्त डाक थैला	Combined mail

Russian

Paper-I (Written)

Time : 3 Hours **Max.Marks : 100**

1. Translation from English to Russian 30
2. Translation from Russian to English. 40
3. Write a small paragraph (one out of three topics) : 30

Toppics : My friend; About myself; My family; My classroom; My teacher.

Course of Reading & Prescribed Text-Book :

"Russian" by Wagner V.N. & Ovsienko Y.G. (Lessons : 1 to 25), PPH, 1991.

Note : Dictionaries are allowed.

Russian

Paper-II

Time : 3 hrs. **Max.Marks : 100**

(A) (Written) Grammar **50 Marks**

Course of Reading & Prescribed Text-Book :

- All the cases in singular form (Nouns only).
- Verbs of motion without prefixes :

in simple form

"Russian" by Wagner V.N. & Ovsienko Y.G.
(Lessons 1 to 25)

"Russian" by Ovsienko Y.G. & Skopina (Part-I)

Note : Exercises in the text-book not related with the prescribed Grammar be excluded while paper setting.

(B)	**Oral/Practical**		**50 Marks**
	-	Reading of a text	15 Marks
	-	Dictation	15 Marks
	-	Simple Conversation	20 Marks

French

Paper-I (Written)

Time : 3 Hours **Max. Marks : 100**

Comprehension, Composition and Civilisation

1. Questions of general comprehension related to the text. e.g. :- Qu'est ce que vous faites le dimanche ou Apprenez - vous le francais 20
2. Questions on comprehension of an unseen passage of about 200 words. 20
3. Composition of dialogue of one three topics covered in the Text book. 20
4. Composition of a small paragraph on general topics pertaining to the text. e.g.: Ma maison, Mon professeur, Ma famille, Une ville tourstique, Un pique-nique. (One out of two topics) 20
5. Simple questions of general interest on French. 20
   Pertaining to the text. (Questions on important Cities, Regions, Mountains, Monuments, Rivers, National Day, National Flag, National Song, Cusine.
   Ten questions to be attempted out of 15. These questions are to be asked in the form of fill in the blanks or multiple choice questions.

Course of Reading & Prescribed Text-Book :

"Connexions-1" by Regine Merieux & Yves Loiseau, Published by Didier, 2004.

French

Paper-II

Time : 3 Hrs. **M.Marks : 100**

A : (Written) Grammar & Translation **Marks : 50**

1. Translation of a simple unseen passage or short sentences from English to French. 10
2. Translation of a simple unseen passage or short sentences from French to English. 10
3. Questions on applied grammar pertaining to the text-book. 30

Course of Reading & Prescribed Text-Book :

"Connexions-1" by Regine Merieux & Yves Loiseau Published by Didier, 2004.

B : (Oral) Viva **Marks : 50**

- Reading of a text 10 Marks
- Dictation 10 Marks
- Simple Conversation 20 Marks
- Oral Comprehension 10 Marks

Urdu (Elective)

Paper-A

Time : 3 Hours **Max. Marks : 100**

Note : Instructions for the paper setters/examiners :

Each question paper may consist of three sections as follows :

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question up to two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answer to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Prose & Poetry

Explanation of Prose passages

Explanation of verses

Summary of a poem or a lesson

Book Prescribed

Urdu Nisab Part II, Published by M/S Educational Book House, A.M.U. Market, Aligarh.

Urdu (Elective)

Paper-B

Time : 3 Hours **Max.Marks : 100**

Note : Instructions for the paper setters/examiners :
Each question paper may consist of three section as follows :

Section-A will consist of 10 very short answer questions with answers to each question up to 5 lines in length. All questions will be compulsory. Each question will carry two marks; total weights of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question up to two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question up to 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

a) Essay and Composition :

Essay

Letter/Application

Opposite words, Numbers Genders and Idioms.

b) Media and Information :

News paper, Journals, Radio and TV : Introduction and Importance.

Books Recommended :

1. Guldasta-e-Mazamin-o-Insha Pardazi, Part-II by Dr. Aarif Mohammad Khan, Published by M/S Educational Book House, A.M.U. Market, Aligarh.
2. Akhbar Ki Kahani by Ghulam Haider, Tarraqi Urdu Board, New Delhi.
3. Rehbar-e-Akhbar Navisi by Syed Iqbal Qadri, Tarraqi Urdu Board, New Delhi.
4. Urdu Sahafat Ki Tarikh by Nadir Ali Khan, National Council for Promotion of Urdu, R.K. Puram, New Delhi.
5. Television Ki Sahafat by Shakil Hasan Shamsi, Educational Book House, AMU Market, Aligarh.
6. Television Nashariyat by Anjum Usmani, Educational Book House, AMU Market, Aligarh -202002(UP) 2005.

Persian (Elective)

Paper - A

Time : 3 Hours **Max.Marks : 100**

Note : Instructions for the paper setters/examiners :

Each question paper may consist of three sections as follows :

Section-A will consist of 10 very short answer questions with answer to each question up to five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question up to two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question up to five pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Prose and Poetry :

Explanation of prose passages

Explanation of verses

Bibliographical questions on the poets and writers studied.

Books Prescribed :

Farsi-O-Dastur Part-II by Dr. Zehra Khanlari,

Published by Idara Adabiayat, 5803-Sadar Bazar,

Delhi-6.

Following lessons are included in syllabus

1,2,11.20,26,27,29,30,32,33,38,39,47,49 and 50.

Books Recommended :

1. Sher-ul-Ajam Part-I, (Pages-30-36 and 144-152). Anjuman Tarriqi, Urdu Hindi, Delhi.
2. Sher-ul-Ajam, Part-II, (Pages 212-298), Anjuman Tarraqi Urdu, Jama Masjid, Delhi, 6.
3. Tarikh-e-Adabiyat-e-Iran by Raza Zada Shafaq, Tr. By Mubariz-ud-din Rif'at, Edara Musannifin, Hyderabad, 1998, (Pages 87-95 and 150-157).
4. Tarikh-e-Islam By Akbar Shah Khan Najibabadi, Part-II, (Pages 362-380.) Edara Musannifin, Azamgarh.
5. Subak Shinasi Part-II By Malik-ush-Sho'ara Bahar (Pages 124-126)
6. Gulistan-e-Sa'di. Anjuman Tarraqi Urdu, Jama Masjid, Delhi.
7. Qabus Nameh, Anjuman Tarraqi Urdu, Jama Masjid, Delhi, 06.
8. Marzban Nameh. Anjuman Tarraqi Urdu, Jama Masjid, Delhi, 110006.
9. A Literary History of Persia, Vol. I By E.G. Brown, (Pages 275-289) & Vol. II, (Page-489).

Persian (Elective)

Paper-B

Time : 3 Hours **Max.Marks : 100**

Note : Instructions for the paper setters examiners :

Each question paper may consist of three sections as follows :

Section-A will consist of 10 very short answer questions with answers to each question up to five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question up to two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question up to 5 pages in length. Four question will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

a) Composition :

i) Short Essay (at least ten sentences in Persian on any one of the following)

Rafique Man, Darsgah-e-Man, Watan-e-Azizam, Sha'ir-e-Maroof, Kitabi ke Man Pasandam, Fasalha-e-Hind, Amozgaram, Mashaghil, Khuda-e-bartar & Ahmiyat-o-Favaid-e-Riyazat-e-Badani.

ii) Translation of unseen passages or sentences in Urdu/English/Hindi/Punjabi.

iii) Translation of simple Sentences into Persian.

b) Grammar : Definitions and kinds :

Nihad-o-Guzare, Fail-o-Zamane Fail (Mazi, Haal, Mustaqbal & Muzare) Shakhs (Avval, Dom & Som), Shakhs (Mufarrad and Jama), Fail Ism, its kinds & Numbers and Zamir.

c) Media and Information :

News paper, Journals, Radio and T.V. Introduction and Importance

Books Prescribed :

1. Farsi-o-Dastur, Zohra Khanlari, Edara Adabyat, Sadar Bazar Delhi, 110006, (Pages : 18, 32, 33, 43, 44, 52, 54, 63, 64, 75, 76, 91, 92, 101, 102, 111, 112, 120 & 121) (Year 1992).
2. Farsi-o-Dastur Tarjuma, Part-II by Dr. Nargis Jahan, published by Idara Adabiyat, Sadar Bazar, Delhi.

Books Recommended :

1. Akhbar Ki Kahani by Ghulam Haider, Taraqqi Urdu Board, New Delhi.
2. Rehbar-e-Akhbar Navisi by Syed Iqbal Qadri, Taraqqi Urdu Board, New Delhi.
3. Urdu Sahafat Ki Tarikh by Nadir Ali Khan, Urdu Academy, Delhi.
4. Television Ki Sahafat by Shakeel Hasan Shamsi, 37-Johri Mohalla, Lucknow.
5. Television Nashariyat by Anjum Usmani, Maktaba Jamia Ltd., Jamianagar, Delhi.

History

Paper-A : History of India upto C. 1000

Time : 3 Hours **Max. Marks : 100**

Note : The question paper shall consist of two sections as follows:

Section-A: The examiner will set 10 questions and the candidates will attempt 7 questions carrying 4 marks each. Answer to each question will be in 10 to 15 sentences. The total weightage of the section will be 28 marks.

Section-B: The examiner will set 8 questions which will cover the entire syllabus. The candidates will attempt any 4 questions in atleast 5 pages each. Each question will carry 18 marks. The total weightage of this section will be 72 marks.

Important Note : Paper Setter must ensure that questions in Section-A do not cover more than one point, and questions in Section-B should cover atleast 50 percent of the theme.

1. **Sources :** Meaning of the term 'ancient', Literacy sources Vedic literature, Epics and Puranans, Buddhist and Jain text, Sangam literature; Accounts of Indians and foreigners; Archeological Sources; Coins, Inscriptions and Monuments.
2. **The Indus Civilization** : Origin; Harappa and Mohenjodaro; Political organization; Town—planning and architecture; Agriculture, technology; trade contacts with the outside world; religion; script, seals and figurines, Causes of disintegration.
3. **The Indo Aryans** : Original home; Geographical area known to Vedic text; Social Institutions: Family, Varna and the Caste system, Religious ideas and rituals; Economy; Political Organization—Changes in the later Vedic period; Emergence of the republics and kingdoms; Growth of towns.
4. **Jainism and Buddhism** : Social and political conditions;

Doctrines of Jainism and sectarian development; Teaching of Gautam Buddha; The Sangha organization; Spread of Buddhism; its decline Legacy of Buddhism and Jainism.

5. **The age of the Mauryas** : Establishment of the Mauryan Empire; Expansion of the empire; the Kalinga War; Policy and administration; Contact with neighbouring states; Ashoka's Dhamma; Decline of the Mauryan empire.
6. **The Kushanas** : Kanishka and his successors; Mahayana Buddhism; Ghandhara Art; Literature.
7. **The Gupta Age** : Establishment of the Gupta Empire; its expansion under Samundragupta and Chandragupta-II; Administration; Revenue system; Trade and Commerce; Arts and architecture; Literature and philosophy; Science and Technology. The Huna invasions and the decline of the Gupta Empire.
8. **The Age of the Vardhanas** : Establishments of Vardhana kingdom; Harsha's campaigns and political relations; Sources of revenue; Patronage of religion, Literature and education.
9. **The Cholas** : Important centres of power in the South; Establishment of the Chola power; Extent of the Chola empire; Administration; Economy; Trade, Art and Architecture religion and Philosophy.
10. **The Rajputs** : Origins; Polity and administration; Social and Religious life; Literature and art.

History

Paper-B : History of India (C. 1000-1707 A.D.)

Time : 3 Hours **Max. Marks : 100**

Note : The question paper shall consist of two sections as follows:

Section-A : The examiner will set 10 questions and the candidates will attempt 7 questions carrying 4 marks each. Answer to each question will be in 10 to 15 sentences. The total weightage of the section will be 28 marks.

Section-B : The examiner will set 8 questions which will cover the entire syllabus. The candidates will attempt any 4 questions in atleast 5 pages each. Each question will carry 18 marks. The total weightage of this section will be 72 marks.

Important Note : Paper Setter must ensure that questions in Section-A do not cover more than one point, and questions in Section-B should cover atleast 50 percent of the theme.

1. **The Conquests of the Ghaznavis and Ghauris** : Political condition of India; Invasions of Mahmud Ghaznavi; their effects, Battles of Muhammad Ghauri, Causes of the success of the Turks.
2. **Establishment of the Sultanate of Delhi** : Political and military development under Qutitbuddian Aibak Iltumish's and his successors; Consolidation of the Sultanate under; Balban and Mongol invasions.
3. **The Khiljis** : Emergence of the Khiljis under Jalaluddin and Alauddin Khiljis; Alauddin's conquests Mongol invasions; Treatment of the nobility; Land revenue reforms, Economic reforms.
4. **The Tughlaqs** : Muhammad-bin-Tughlaq; His experiments; Causes of disaffection and revolts; Feroze Tughlaq;

Administrative and economic policies and their effects Taimurs; Invasions.

5. **The Vijaynagar Kingdom** : Establishment and expansion; Polity, economy and administration; Art and Architecture.
6. **Mughal-Afghan Struggle (1526-1556)** : Political condition of India; Advent of the Mughals under Babur; Battle of Panipat and its aftermath; Battle of Kanwaha, Battles of Humayun; expansion of the Afghan power under Sher Shah Suri, Administrative reforms; return of Humayun.
7. **Re-establishment and expansion of the Mughal empire under Akbar**: Conquests, extent of empire, Religious policy, Rajput policy.
8. **Expansion and Decline under Akbar's Successors** : Jahangir and Mewar; North-western campaigns; extension of influence over the Deccan; Conquest of Ahmednagar by Shah Jahan; Rise of Aurangzeb to power.
9. **The establishment of Maratha Power** : The rise of Shivaji, Maratha administration, Land revenue system; Chauth and Sardeshmukhi.
10. **The Mughal Government Administration and Culture**: Position of the King : Central and local adminstration; Land revenue system; Mansabdari; Jagirdari; State policy towards agriculture, Trade and Commerce, Literature, Arts and Architecture and Culture.

Political Science

Paper – A

Principles of Political Science

Time : 3 Hours **Max. Marks: 100**

20 x 4 = 80

10 x 2 = 20

Instructions for the Paper Setter:

The question paper will consist of five Sections:A,B,C,D and E. Section A,B,C and D will have two questions from the respective portion of the syllabus and will carry 20 marks each. Section E will consist of 10 short answer type questions to be set from the entire syllabus i.e. sections A, B, C & D and will carry 20 marks in all, such short answer type questions carry 2 marks.

Instructions for the Candidates :

Candidates are required to attempt one question each from Section, A, B, C, and D of the question paper and the entire Section E. The candidates are required to answer the short question in not less than 50 words.

Section — A

1. **Political Science:** Meaning, Nature and Scope.
2. Relationship of Political Science with Economics, History, Sociology and Psychology.

Section — B

1. **State:** Definition, Elements and its distinction from Government and Society.
2. **Theories of the Origin of State:** Social Contract, Historical /Evolutionary and Marxian Theory.

Section — C

1. **State:** Liberal, Marxian and Gandhian views of State.
2. **Welfare State:** Concept and Functions of Welfare State

Section — D

1. **Sovereignty:** Definition, Attributes and Types of Sovereignty.
2. **Theories of Sovereignty:** Monistic and Pluralistic.

Recommended Books:

1. J. C. Johari, *Principles of Political Science,* Sterling Publishers, New Delhi.
2. S.P. Verma, *Political Theory,* Geetanjali Publishing House, New Delhi.
3. A.C. Kapur, *Principles of Political Science*, S. Chand & Company, New Delhi.
4. E. Asirvatham, *Political Theory*, S. Chand & Company, New Delhi.
5. M.P. Jain, *Political Theory*, Authors Guild Publication, Delhi, (Punjabi & Hindi).
6. David Easton, *The Political System*, Scientific Book Agency, Calcutta.
7. D.C. Bhattacharya, *Political Theory,* Vijay Publishing House, Calcutta.
8. O.P. Gauba, *An Introduction to Political Theory*, Macmillan Indian Ltd., New Delhi.
9. Satish Kumar Sharma, *Adhunik Rajnitik Vishleshan,* Publication Bureau, Punjabi University, Patiala.
10. Andrew Heywood, *An Introduction to Political Theory*, New Delhi, Palgrave Publications, 2004.
11. Aeon J. Skoble and Tibor R. Machan, *Political Philosophy,* Ist Edition, New Delhi, Pearson, 2007.

Political Science

Paper – B

Modern Political Theory

Time : 3 Hours **Max. Marks = 100**

20x4 = 80

10 x 2 = 20

Instructions for the Paper Setter:

The question paper will consist of five Sections:A,B,C,D and E, Section A,B,C and D will have two questions from the respective portion of the syllabus and will carry 20 marks each. Section E will consist of 10 short answer type questions to be set form entire syllabus i.e. Sections A, B, C & D and will carry 20 marks in all, such short answer type questions carry 2 marks.

Instructions for the Candidates:

Candidates are required to attempt one question each from Section A, B, C and D of the question paper and the entire Section E. The candidates are required to answer the short question in not less than 50 words each.

Section — A

1. **Political System:** Meaning, Characteristics and Functions.
2. **Political Culture:** Meaning, Characteristics and Types.
3. **Political Socialisation:** Meaning, Characteristics and Agencies.

Section — B

1. **Rights and Duties:** Meaning, Types and Relationship between the Two.
2. Universal Declaration of Human Rights.
3. **Environmental Protection:** Issue and Efforts.

Section — C

1. **Liberty**: Meaning Types and its Safeguards.
2. **Equality:** Meaning, Types and Relationship between Liberty and Equality.
3. **Justice**: Meaning and its various Dimensions.

Section — D

1. **Democracy:** Meaning, Characteristics and Types.

2. **Theories of Democracy:** Liberal, Marxian and Elitist Theory.

Recommended Books:

1. J. C. Johari, *Principles of Political Science*, Sterling Publishers, New Delhi.
2. S.P. Verma, *Political Theory*, Geetanjali Publishing House, New Delhi.
3. A.C. Kapur, *Principles of Political Science,* S. Chand & Company, New Delhi.
4. E. Ashirvatham, *Political Theory,* S. Chand & Company, New Delhi.
5. M.P. Jain, *Political Theory,* Authors Guild Publication, Delhi, (Punjabi & Hindi).
6. David Easton, *The Political System,* Scientific Book Agency, Calcutta.
7. D.C. Bhattacharya, *Political Theory,* Vijay Publishing House, Calcutta.
8. O.P. Gauba, *An Introduction to Political Theory,* Macmillan Indian Ltd., New Delhi.
9. Satish Kumar Sharma, *Adhunik Rajnitik Vishleshan,* Publication Bureau, Punjabi University, Patiala.
10. John-Hoffman and Paul Graham, *Introduction to Political Theory,* New Delhi, Persons, 2006.

Sociology

Paper-A

Fundamentals of Sociology-I

Time : 3 Hours **Max. Marks : 100**

Note : Question paper may consist of two sections as follows:
Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks: total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answers to each question upto three pages in length or in 500 words. The examiner will set fifteen questions (at least 7 from each unit) and the candidate will attempt eight (four from each unit). Each question will carry ten marks. Total weightage of the section being 80 marks.

Unit-I

(a) Meaning, Nature and Scope of Sociology

(b) Defining Sociology—the Sociological Perspective

(c) Sociology and Social Sciences–Psychology, Anthropology, Economics and Political Science

Unit-II

(a) Basic Concepts : Society, Community, Institution and Association.

(b) Social Groups : Definition, Characteristics and Types—Primary & Secondary, In group and Out group, Reference Groups.

(c) Social Structure : Definition, Elements and Patterns, Norms and Values, Status and Role.

Sociology

Paper-B

Fundamentals of Sociology-II

Time : 3 Hours **Max. Marks : 100**

Note : Question paper may consist of two sections as follows:
Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks: total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answers to each question upto three pages in length or in 500 words. The examiner will set fifteen questions (at least 7 from each unit) and the candidate will attempt eight (four from each unit). Each question will carry ten marks. Total weightage of the section being 80 marks.

Unit-I

(a) Socialization : Meaning, Processes, Agencies and Theories of self (C.H. Cooley, G.H. Mead, Sigmund Freud).

(b) Culture : Meaning elements, Cultural lag.

(c) Social Stratification : Meaning and forms.

Unit-II

(a) Social Control; Meaning, Agencies : Formal and Informal.

(b) Formal : Law, Informal : Folkways, Mores, Customs, Public Opinion, Propaganda.

(c) Deviance : Crime, Anomie, Terrorism

Books Recommended for Paper A and B

1. Ahuja Ram : *Indian Social System*, Rawat Publications, Jaipur, 1993.
2. Abraham, M. Frances : *Contemporary Sociology,* Oxford University, New Delhi, 2006.
3. Bottomore, T.B.S. : Sociology, Punjabi Translation by Parkash

Singh Jammu, Publication Bureau, Punjabi University, Patiala, 1972.

4. Davis, Kingsley : *Human Society,* Punjabi Translation by Parkash Singh Jammu, Publication Bureau, Punjabi University, Patiala, 1971.
5. Gisbert, Pascual : *Fundamentals of Sociology,* Orient Longmans, Bombay, 1969.
6. Jayaram N. *Introductory Sociology,* Mac Millan India, Madras, 1988.
7. Johnson, H.M. *Sociology : A Systematic Introduction,* Allied Publishers, New Delhi, 1995.
8. Kapila, S : *A Text-Book of Sociology,* Part-I & II, New Academic House, Jalandhar 1989.
9. Kapila S : *Fundamentals of Sociology,* Vol. I, Kapila Publishers, Panchkula, 2001.
10. Koening, Samuel : *Sociology—An Introduction to the Science of Society,* Punjabi Translation by Baldev Singh, Publication Bureau, Punjabi University, Patiala, 1984.
11. McGee, Reece et al., *Sociology-An Introduction,* Reinehart and Winston, Hindale, 1977.
12. Murdock, George Peter : *Social Structure,* Free Press, New York, 1965.
13. MacIver, R.M. & Page, Charles N. Society, *An Introductory Analysis.* Macmillan, London, 1974.
14. Savinderjeet Kaur : *Samaj Vigyan Nal Jan Pehchan,* Publication Bureau, Punjabi University Patiala, 1995.
15. Sharan Raka : *A Hand book of Sociology,* Annual Publications, New Delhi, 1991.

Public Administration

Paper - A

Administrative Theory

Time : 3 Hours **Max. Marks : 100**

Note : **Each question paper will consist of Two sections as follows:**

Section-A : The examiner will set 10 questions. Candidate will attempt 7 questions carrying 4 marks in 10-15 sentences each. The total weightage of this section will be 28 marks.

Section-B : The examiner will set 8 questions which will cover the entire syllabus. Candidate will attempt any 4 questions in at least 4-5 pages each. Each question will carry 18 marks. The total weightage of this section will be 72 marks.

Introduction- Meaning, nature and scope; Public Administration as an Art and a Science, Public Administration and Private Administration, Relationship of Public Administration with other social sciences–Political Science, Sociology, Economics, History, Psychology, Law. New Public Administration, New Public Management and Good Governance.

Organization- Meaning, Formal and Informal Organisation. Basic Principles of Organisation–Hierarchy, Span of control, Unity of Command; Centralization and Decentralization. Delegation, Co-ordination and Supervision.

Chief Executive- Meaning, Types & Functions, Line and Staff Agencies, Department, Public-Corporation and Independent Regulatory Commission, Delegated Legislation, Administrative Tribunals.

Administrative Behaviour – Leadership, Communication, Decision making, control over Administration.

Suggested Readings :

1. Awasthi, Maheshwari S.R., Public Administration, Lakshmi Narain Aggarwal, Agra, 2004.
2. Basu Rumki, Public Administration : Concept and Theory, Sterling Publishers Pvt. Ltd., New Delhi, 1990.
3. Bhattacharya Mohit, Restructing Public Administration—Essays in Rehabiliation, IInd Edition, Jawahar Publishers and Distributors, New Delhi, 1999.
4. Kapoor Usha, Lok Prashashan—Sidhant Ate Vihar, Publication Bureau, Panjabi University, Patiala.
5. Puri K.K., Elements of Public Administration, (Punjabi). Bharat Prakashan, Jalandhar, 2004.
6. Sharma M.P. and Sadana B.L., Public Administration, Kitab Mahal, Allahabad, 1993.
7. Sahib Singh and Swinder Singh, Public Administration : Theory and Practice, New Academic Publishers, Jalandhar, 1997.
8. White L.D., Introduction to the Study of Public Administration, Macillan, New York, 1995.

Public Administration

Paper - B

Indian Administration

Time : 3 Hours **Max. Marks : 100**

Note : Each question paper will consist of Two sections as follows:

Section-A : The examiner will set 10 questions. Candidate will attempt 7 questions carrying 4 marks in 10-15 sentences each. The total weightage of this section will be 28 marks.

Section-B : The examiner will set 8 questions which will cover the entire syllabus. Candidate will attempt any 4 questions in at least 4-5 pages each. Each question will carry 18 marks. The total weightage of this section will be 72 marks.

Main features of Indian Administration : Nature of Indian Federalism, Union-State Relations. Legislative, Administrative and Financial.

Central Administration : President, Prime Minister, PMO., Council of Ministers. Central Secretariate; Organisation and Functions, Cabinet Secretariate. **Parliament** - Lok Sabha, Rajya Sabha, Speaker.

Judicial System : Supreme Court and High Court.

State Administration : Governor, Chief Minister, Council of Ministers, Chief Secretary, State Legislature. State Planning Commission.

Divisional and District Administration : Features, Functions and role of Divisional Commissioner and Deputy Commissioner.

Control over Administration : Executive, Legislative and Judicial Citizens Control over Administration.

Suggested Readings :

1. Arora Ramesh K. and Goyal R., Indian Public Administration, Vishwa Prakashan, New Delhi, 2002.
2. Avasthi and Avasthi, Indian Administration, Lakhsmi Narain, Agra, 2000.
3. Bhagwan Vishnoo and Bhushan Vidya, Indian Administration, S. Chand & Company, New Delhi, 2000.
4. Fadia B.L. Fadia Kuldeep, Indian Administration, Sahitya Bhawan Publishers, New Delhi, 2005.
5. Hoshiar Singh, Indian Administration, Kitab Mahal, Allahabad, 2000.
6. Jain R.B. Contemporary Issues in Indian Administration, Vishal Publications, New Delhi, 1976.
7. Maheshwari S.R., Indian Administration, Orient Longman, New Delhi, 2000.
8. Maheshwari S.R., State Government in India, McMillan, New Delhi, 1979.
9. Sachdeva Pardeep, Bharti Prashasan, Publication Bureau, Panjabi University, Patiala, 2002.
10. Singh J.P.: Samaj Vigyan Vishvakosh: Encyclopaedia of Sociology and Allied Sciences, PHI Learning Pvt. Ltd., New Delhi, 2009.

Psychology

Paper-A

Basic Psychological Processes-I

Time : 3 Hours **Max. Marks : 75**

Note: 1. The use of Non-Programmable calculators and Statistical Tables are allowed in the examination.

2. Only one numerical question is to be set either of nine marks (from Section-B) or of twelve marks (from Section-C).

3. The question paper may consist of three Sections as follows :

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry 1½ marks; total weightage of the section being 15 marks.

Section-B will consist of short answer question with answers to each question upto two pages in length. Six questions will be set by the examiner and four will be attempted by the candidates. Each question will carry 9 marks: total weightage of the section being 36 marks.

Section-C will consist of essay type questions with answer to each question upto five pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Total weightage of the section being 24 marks.

(The questions are to be set to judge the candidates basic understanding of the concepts)

Nature : Psychology as a Science, Historical back ground of psychology with brief introduction to schools (Structuralism, Functionalism, Behaviourism, Gestalt and Psychoanalysis).

Methods : Introspection, Observation, Experiment Case Study, Interview and Questionnaire.

Biological Bases of Behaviour : The role of Heredity and Endocrine glands.

Nervous System : Neuron, Central nervous system and peripheral nervous system, neuron (Structure and function) synapse, types of synapse. Resting and Action Potentials.

Understanding Individual Differences : Nature and uses of Psychological Tests. Characteristics of Good Psychological Tests, Types of Psychological Tests (Verbal/Non-verbal test, Individual/ group, speed\power tests, Paper and Pencil Tests/Performance Tests, Essay/objective type Tests), Ethical issues in Psychological Testing.

Measures of Central Tendency : Meaning and Characteristics of good measure of central tendancy. Measures of central tendency—Mean, Median, Mode and their merits and demerits.

Measures of Variability : Meaning and Characteristics of good measure of variability, Measures of variability- Range, Quartile Deviation, Average, Standard Deviation variance their merits and demerits.

Readings:

1. Benjamin, Jr. L.T. Hopkings, J.R.: Nation, J.R. Psychology, Mcmillan Publising Co., New York, 1987.
2. Chaplin, J.R. & Kraiwic, T.S., Systems and Theories of Psychology, Holt, Rinehart and Winston, Inc. New York, 1985.
3. Crooks, R.L. and Strin Jean; Psychology; Sciences: Behaviour and Life, Holt Rinehart and Winston, Inc. New York, 1988.
4. Hall, S.S. and Lindzey : Theories of Personality, Wiley Eastern Ltd. New Delhi, 1969.
5. Morgan, G.T., King, P.A., Weiaz, T.R. and Schapter, Introduction to Psychology, Mcgraw Hill Book Co., New York, 1999.
6. Aron, Statistics for Psychology, Pearson Education, New Delhi, 2007.
7. Carlson, Foundation of Physiological Psychology, Pearson Education, New Delhi, 2007.
8. Pinel, Biopsychology, Pearson Education, New Delhi, 2007.

Psychology

Paper-B

Basic Psychological Processes-II

Time : 3 Hours **Max.Marks : 75**

Note: 1. The use of Non-Programmable calculators and Statistical Tables are allowed in the examination.

2. Only one numerical question is to be set either of nine marks (from Section-B) or of twelve marks (from Section-C).

3. The question paper may consist of three sections as follows :

Section-A will consist of 10 very short answer question with answers to each question upto five lines in length. All questions will be compulsory, each question will carry 1½ marks; total weightage of the section being 15 marks.

Section-B will consist of short answer questions with answer to each question upto two pages in length. Six questions will be set by the examiner and four will be attempted by the candidates. Each question will carry 9 marks: total weightage of the section being 36 marks.

Section-C will consist of essay type questions with answer to each question upto five pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Total weightage of the Section being 24 marks.

(The questions are to be set to judge the candidates basic understanding of the concepts)

Learning : Introduction to learning, Trial and Error and Insight, Nature and characteristics of learning process. A brief introduction to the concepts of Classical and Instrumental conditioning (Paradigm and the typical experiment), Verbal learning (Nature & factors); Social learning.

Memory : Nature, Encoding, Storage and Retrieval. Types of memory—sensory, short-term and long term.

Motivation and Emotion : Biogenic and sociogenic motives, instincts, Drives and incentives. Intrinsic-Extrinsic framework. Content Theory, The need Hierarchy model; Conflicts and Frustration, Emotions: Development and Types of emotions. Theories of Emotions (James Lange & Cannon Bard Theory) Physiological Correlates of Emotions.

Intelligence : Nature of Intelligence Theories (Spearman and Thurstone), Cognitive Theories (Gardener and Sternberg) Concept of Emotional Intelligence, Nature and Nurture issue in intelligence.

Personality : Concept of Personality. Theories of Personality (Freud, Allport, Murray, Cattell & Eysenck). Techniques of Assessment (Psychometric and Projective)

Readings :

1. Baron, R.A., Psychology, Prentice Hall of India, New Delhi,1996.
2. Benjamin, Jr. L.T. Hopking, J.R. Nation, J.R. Psychology, Macmillan Publishing Co., New York, 1987.
3. Chaplin, J.R. & Kraiwic, T.S., Systems and Theories of Psychology, Holt Rinehart and Winston, Inc. New York, 1985.
4. Crooks, R.L. and Strin Jean; Psychology: Science, Behaviour and Life, Holt Rinehart and Winston, Inc., New York, 1988.
5. Hall, S.S. and Lindzey: Theories of Personality, Wiley Eastern Ltd. New Delhi, 1940.
6. Morgan, G.T., King, P.A., Weisz, T.R. and Schapter, J., Introduction to Psychology, McGraw Hill Book Co., New York,1999.
7. Coon, D.L. Mitterer, J.O. Introduction to Psychology Gateways to Mind and Behaviour. Thomson Wadrwoth, 2007.
8. Solso, Cognitive Psychology, Pearson Education, New Delhi, 2007.

Psychology

Practicals

Time : 3 Hours **Max. Marks : 50**

Note : Any Ten practicals out of Twelve are to be conducted

1. Public opinion survey.
2. Effect of Knowledge of Results on Performance.
3. Measurement of Motivation through drive induction or level of aspiration.
4. Trial and error Learning.
5. Verbal Test of Intelligence.
6. Nonverbal test of Intelligence.
7. Projective techniques—Incomplete sentence Blank.
8. Concept Formation.
9. Problem Solving.
10. Memory Span.
11. Effect of Practice on Learning.
12. Simple Reaction Time.

Defence and Strategic Studies

Theory Marks : 160
Practical Marks : 40
Total : 200

Paper-A
War and its Various Aspects

Time : 3 Hours **Max.Marks: 80**

Teaching periods : 75

Note : Question paper shall consist of two sections as follows:

Section-A : The examiner shall set 10 questions and the candidates will attempt 7 questions carrying 4 marks each. Answer to each question shall not exceed half of the page. The total weightage of this section shall be 28 marks.

Section-B : The examiner shall set 8 questions for the entire syllabus-two from each Unit. The candidate shall attempt any four questions, one from each Unit. Each question shall carry 13 marks. The total weightage of this Unit shall be 52 marks.

Note : *Practicals are only meant for the regular students. For the private students the two papers shall be of 100 marks each. For the private students, each student, each question in Section B will be of 18 marks.*

Unit-I

1. War

a) Nature, Concept and Definition

b) Origin of War

c) History of Warfare

i) Animal Warfare

ii) Primitive Warfare

iii) Historical Warfare

2. Modern Warfare

i) Meaning and Definition.

ii) Features of Modern Warfare.

3. Principles of War

a) Meaning and Importance.

b) Historical Development and Application.

Unit-II

1. War as an instrument of Policy

2. Guerilla Warfare

i) Origin and Concept

ii) Principles, Techniques & Characteristics of Guerilla Warfare.

iii) Counter Gureilla Warfare.

Unit-III

1. Psychological Warfare

a) Definition and Concept

b) Functions.

c) Limitations

2. Psychological Aspects of War

a) Leadership

b) Discipline

c) Motivation

d) Morale

e) Fear and Panic.

Unit-IV

1. Nuclear Warfare

i) Beginning of Nuclear era and effects of Nuclear explosion.

ii) Missiles : Types and their Classification.
iii) Nuclear weapons: Fission & fusion bombs.
iv) Nuclear Strategies for Defence:
(Preventive, Pre-emptive, Massive Retaliation and Flexible Response)

Books Recommended

1.	Bhagat P.S.	Defence of India and South-East Asia.
2.	Boring, E.	Psychology in the Armed Forces.
3.	Chandra, P.	International Politics.
4.	Clausewitz, V.V.	On War.
5.	Copeland, Norman, J	Psychology of a Soldier.
6.	Encyclopaedia Americana	
7.	Encyclopaedia Britannica	
8.	Hasnain, Qamar	Psychology for the fighting man.
9.	Khapp, W.	A History of War and Peace.
10.	Lineberger, Paul M.A	Psychological Warfare.
11.	Mukherji & Shiam Lal	A Text book of Military Science, Vol.11.
12.	Osanka, F.M.	Modern Guerilla Warfare.
13.	Palmer & Perkins	International Politics.
14.	Patel Satyavrata, R.	A Text Book of International Law.
15.	Sampooran Singh	Nuclear Warfare.
16.	Sidhu, K.S.	War its Principles.
17.	Tripathi, K.S.	Evolution of Nuclear Strategies.
18.	Mao-Tse Tung	Modern Guerilla Warfare.
19.	Wright, Quincy	Study of War.
20.	Kalkat, O.S. & Sidhu S.	Jung:Sankalp Ate Vividh Path, (Punjabi).

21.	Palit, D.K. (ed).	Sanik Gyan de Mul Niyam (Punjabi). Hardial Singh Gill
22.	Kamar Husnain, (ed.)	Fauji Prati Mano Vigyan (Punjabi) Darshan Singh.
23.	Paramjit Singh	Yudh ate Surakhiya (Punjabi)
24.	Bhupinder Singh	Defence Studies.

Defence and Strategic Studies

Paper-B

International Relations : Defence Aspects

Time : 3 Hours **Max. Marks : 80**

Teaching Periods : 75

Note : Question paper shall consist of two section as follows:

Section-A : The examiner shall set 10 questions and the candidates will attempt 7 questions carrying 4 marks each. Answer to each question shall not exceed half of the page. The total weightage of this section shall be 28 marks.

Section-B : The examiner shall set 8 questions for the entire syllabus two from each unit. The candidate shall attempt any four questions one from each Unit. Each question shall carry 13 marks. The total weightage of this Unit shall be 52 marks.

Note : *Practicals only meant for the regular students. For the private students the two papers shall be of 100 marks each. For the private students, each question in Section B will be of 18 marks.*

Unit-I

1. **National Interest :**
   - i) Concept and definition.
   - ii) Vital and non-vital elements
   - iii) Instruments to serve National Interest.
2. **The United Nations :**
   - i) Structure (Organs and specialised agencies)
   - ii) Functions

Unit-II

1. Balance of Power

i) Meaning and Concept

ii) Historical Development of the system.

iii) Functioning of the system.

2. Collective Security

i) Meaning & Concept.

ii) Role of UN in maintaining collective security.

Unit-III

1. Diplomacy

i) Definition.

ii) Types and uses

2. Frontiers and Boundaries

i) Difference between Frontiers and Boundaries.

ii) Types of Boundaries.

iii) Importance of Boundaries.

Unit-IV

1. Humanisation of War

i) Definition and Concept.

ii) Geneva Conventions.

2. Means to Settle International Disputes

i) Pacific Means.

ii) Coercive Means

3. Disarmament and Arms Control

i) Difference between Disarmament and Arms Control.

ii) Types of Disarmament.

iii) Efforts made by UN towards Disarmament.

iv) Efforts, Made outside the UN towards disarmament.

Books Recommended

1. Curzon, Lord of Kedpeston : Forntiers.
2. Encyclopaedia Americana.
3. Encyclopaedia Britannica.
4. Oppenheim, L. — International Law, Vol. I
5. Patel Satyavrata R. — A Text Book of International Law.
6. Fenwick, Charles G. — International Law.
7. Ghai, U.R. — International Politics.
8. Mehta Narendra — International Relations.
9. Chandra, P. — International Politics.
10. Naik, J.A. — A Text Book of International Relations.
11. Morgenthau, Hans J — Politics among Nations.

Practical

Time : 3 Hours **Max. Marks : 40**

Written : 20

Lecture :10

Practical File : 05

Viva : 05

Group-A

1. **Bearing :**
   Definition, interconversion of Bearing in detail.
2. **Liquid Prismatic Compass :**
   Features and functions of its various parts and attempt following exercise on the LPC:-
   a) To determine magnetic north.
   b) Setting the Map.
   c) To find out the bearing of a point from other point situated on the ground.
   d) To determine one's and enemy's position on the map by resection and intersection method with the help of compass.
   e) To set the compass in a particular direction for night march.
3. Determination of individual compass error.
4. Service protector : Its types and uses.

Group-B

Group Discussion Topics:

a) Terrorism in India.
b) Nuclear non-Proliferation Treaty (NPT)
c) The peace keeping role of the UN.
d) Humanisation of War.

Group-C

Viva Voce.

Group-D

Record

Geography

Paper A : Physical Geography-I : Geomorphology

Time : 3 Hours **Max. Marks : 70**

Objective

The objective of this paper is to introduce the basic concepts in the physical geography, essentially geomorphology to the students of geography in a brief but adequate manner.

Note : Instructions for the paper setter :

1. A compulsory question containing 15 short answer type questions will be set covering the whole syllabus. The students will attempt any 10 parts in about 40-50 words each. Each part will carry 3 marks (Total 30 marks).
2. The whole syllabus will be divided into 4 units. Eight question will be set out of the whole syllabus, 2 from each unit. The students will be required to attempt one question from each unit. These will be in addition to the compulsory question at Serial Number 1 (Total 40 marks).
3. Special credit will be given to suitable use of maps and diagrams.

Unit-I

Geography : Definition, place of physical geography within the discipline of geography, division of physical geography-geomorphology, climatology, oceanography. Theories of the Origin of the Earth : Laplace, Jeans and Jeffreys and Kant.

Interior of the Earth : Constitution, theories on constitution - continental drift (with special reference to Wegener's theory and Plate Tectonics), issotasy.

Unit-II

Movements of the Earth : Orogenic, epeirogenic movements; landforms resulting from forces of compression and tension; mountain building theories (Geosyncline, Hinterland and Introduction to Foreland, Median Mass, Convection Current), earthquakes and volcanoes (causes, types and distribution).

Unit-III

Rocks - Their origin, classification and characteristics.

Major Land Forms : Mountains, plateaus and plains in the world.

Geomorphic Agents : Geomorphic processes (weathering and erosion).

Unit-IV

Geomorphological Landscapes : Fluvial, glacial, aeolian, volcanic, coastal, Karst. *Applied Geomorphology :* Applications to transport, landuse, environmental hazards management etc.

Books Recommended

1. Chawla, I.N. : Bhautik Bhugol (in Punjabi), Bharat Prakashan, Jalandhar.
2. Dayal, P. : A Text Book of Geomorphology, Shukla Book Depot, Patna, 1995.
3. Dury, G.H. : The Face of the earth Penguin, Middlesex, England, 1973.
4. Gass, I.G. : Understanding the Earth, The Artemrs Press, Sussex, 1973.
5. Holmes Arthur : Principles of Physical Geology, Thomas Nelson & Sons, Ltd. New York, Latest Edition.
6. Kale, V. and Gupta A. : Elements of Geomorphology, Oxford University Press, Calcutta, 2001.
7. Kaur Dhian : The Earth, Edited by R.C. Chandna, Kalyani Publishers, Ludhiana, Delhi, 2000.
8. Nizamuddin : An Introduction to Physical Geography, Concept, New

Delhi, 2001.

9. Mamoria, C.P. and Niati, J.L. : Bhautik Bhugol Ke Tatwa (in Hindi), Agra, 1976.
10. Monkhouse, F.J. : Principles of Physical Geography, Orient Longman, New Delhi, Latest Edition.
11. R.N. Tikha : Physical Geography, New Academic Publishing Co. Jalandhar.
12. Singh, Pritam & Bhautik Bhugol De Adhaar, Bhatia, S., Punjabi University Publication, Patiala.
13. Singh, Savinder : Physical Geography, Gynodya Parkashan Gorakhpur, 1994.
14. Sparks, B.W. : Geomorphology, Longman, London, 1986.
15. Strahler, A.N. & : Modern Physical Geography, Strahler A.H. John Wiley, New York, 1992.
16. Thornbury, W.D. : Principles of Geomorphology, Second Edition, Wiley Eastern Ltd., New Delhi, 1993.
17. Singh Malkiat : Principles of Physical Geography, Rasmeet Parkashan, Jalandhar.

Geography

Paper B : Physical Geography-II : (Climatology & Oceanography)

Time : 3 Hours **Max. Marks : 70**

Objective

The objective of this paper is to acquaint the students with the elements and attributes of climatology and oceanography as climate plays a very vital role in human life and oceans are storehouses of resources.

Note : Instructions for the paper setter

1. A compulsory question containing 15 short answer type questions will be set covering the whole syllabus. The students will attempt any 10 parts in about 40-50 words each. Each part will carry 3 marks (Total 30 marks).
2. The whole syllabus will be divided into 4 units. Eight questions will be set out of the whole syllabus, 2 from each unit. The students will be required to attempt one question from each unit. These will be in addition to the compulsory question at serial number 1 (Total 40 marks).
3. Special credit will be given to suitable use of maps and diagrams.

Unit-I

Definition of Climatology : Climate and Weather.

Climate : Elements and controls.

Physical Structure of the Atmosphere and attributes of different lyers.

Physical and Chemical composition of the Atmosphere : Dust particles, vapour particles, active gases, inert gases.

Insolation and Temperature : Horizontal distribution of insolation, factors affecting Temperature of a Place, vertical and horizontal and annual, seasonal and diurnal distribution of temperature.

Unit-II

Atmospheric Pressure and Winds Distribution : Atmospheric disturbances (Tropical cyclones, temperate cyclones and anticyclones).

Atmospheric Moisture : Forms of condensation - cloud, dew, fog, frost and snow. Percipitation forms and types. World patterns of percipitation : Spatial and seasonal.

Climatic Classifications and their Bases : Elementary discussion of Koppen's classification of climates and climatic type.

Role of Climate in Human Life : Atmospheric pollution and global warming - general causes, consequences and measure of control.

Unit-III

Oceanography : Definition, topography of the ocean basins; continental shelf, continental slope, deep sea plain and oceanic deep. ***Features :*** Trench, trough, oceanic ridge, guyots, seamount.

Factors controlling the world patterns of distribution of temperature and salinity in the ocean waters.

Unit-IV

Movements of Oceanic Waters : Waves and currents. Surface currents of the oceans. Marine Flora, Fauna and Deposits, Corals. Ocean as storehouse of resources for the future.

Books Recommended

1. Bhutani, Smita : Our Atmosphere, Edited by R.C. Chandna, Kalyani Publishers, Ludhiana, Delhi, 2000.
2. Critchfield, H.J. : General Climatology, Prentice Hall of India, Private Ltd., New Delhi, 1975.
3. Gross, Grant, M. : Oceanography : A View of the Earth, Prentice Hall, New Jersey, 1987.
4. Lal, D.S. : Climatology, Chainnya Publishing House, Allahabad, 1989.
5. Mathew, J.R. : Climatology, McGraw Hill, New Latest Edition.
6. Monkhouse, F.J. : The Principles of Physical Geography, University of London Press, London Latest Edition.
7. Pattersen, S. : Introduction to Meterorology, McGraw Hill Book Co., London, Latest Edition.
8. Stringer, E.T. : Foundations of Climatology. Subject Publications, Delhi, 1982.
9. Trewartha, G.T. : An Introduction to Climate, McGraw Hill Book Co., New Delhi, International Student Edition, 1980.
10. Khan, N. : An Introduction to Physical Geography. Concept New Delhi,2001.
11. King, C.A.M. : Beaches and Coasts, E. Arnold, London, 1959.
12. King, C.A.M. : Oceanography E. Arnold, London, Latest Edition.

13. Sharma, R.C. & M. Vatel : Oceanography for Geographers, Chetyna, Allahabad 1970.

14. Shepar, F.P. : Submarine Geology, Harper & Sons, New York, 1948.

15. Sverdrup, H.U. et.al. : The Oceans. Prentice Hall, New Jersey, U.S.A. 1959.

Geography

Paper C : Cartography

Time : 3 Hours **Max. Marks : 60**

Distribution of Terminal Exam. Marks :

Written paper of 3 hours : 35 marks

Viva and Practical Record (10+15) : 25 marks

Objectives

Geography is an amalgam of physical as well as social sciences and as such it is necessary for the students to go through laboratory exercises, particularly to show directions and bearings and different methods of representing relief. The concept of scale is to be understood in the initial stage, and also an introduction to weather maps are required.

Unit-I

Maps and Scale

History of Cartography and types of maps, Scales : types of scales, methods of construction of graphic scales-plane scales, diagonal scales and comparative scales-different units, time scales.

Unit-II

Bearings, Enlargement and Reduction:

Direction and Bearings : Plotting of a course, true north, magnetic north, finding true north with the pole star, a watch and a rod; bearing and its conversion.

Enlargement and Reduction : Graphic methods-square and triangle; instrumental methods-Pantographic xeroxing, photographic.

Unit-III

Representation of Relief : Spot heights, Trignometrical stations, Bench Marks form Lines.

Methods of showing Relief : Hachures, Hill-shading, contours, and layer tints.

Unit IV

Weather Maps :

General Introduction to the study of weather maps, the scheme of weather symbols including Beaufort's scale employed in Indian daily weather maps; weather in India : summer season (period of summer monsoon), winter season, forecasting of weather through the study of weather maps and recent advances in weather forecasting.

Note :

1. A compulsory question containing 10 short answer type questions will be set covering the whole syllabus. The students will attempt 7 short answer type questions in about 25-30 words each. Each short answer type question will carry 1 mark (Total 7 marks).
2. The whole syllabus will be divided into 4 units. Eight questions will be set out of the whole syllabus, 2 from each unit. The students will be required to attempt one question from each unit. These will be in addition to the compulsory question at serial number 1.
3. Evaluation of Practical record will be done at the time of viva-voce examination. A minimum of 25 sheets are to be prepared by the students.
4. In case the candidate has applied for the improvement, he/she should be required to make a fresh practical note book.
5. For practical classes, the number of students in one group shall not exceed fifteen.

Books Recommended

Essential Readings

1. Khullar, D.R. : Essentials of Practical Geography, New Academic Publishing Co., Mai Hiran Gate, Jalandhar, 2000.
2. Singh, Gopal : Mapwork and Practical Geography, Vikas Publishing House, Pvt. Ltd., New Delhi, 1995.
3. Singh L.R. & Singh, Raghunandan : Mapwork and Practical Geography, Central Book Depot, Allahabad, 1993
4. Phyllis Dink : Mapwork, Atma Ram & Sons

Further Readings

1. Mishra, R.P. & Ramesh, A. : Fundamental of Cartography, Concept Publishing Co., New Delhi, 1989.
2. Monkhouse, F.J. & Wilkinson, H.R. : Maps and Diagrams, Methuen & Co., London, Third Edition, 1976.
3. Robinson, A.H. & Randall, D. Sale : Elements of Cartography, John Wiley & Sons, New York, (Sixth Edition), 1995.

Journalism and Mass Communication

Paper-A

Time : 3 Hours **Max. Marks : 100**

(Instructions to Mass Communication)

The question paper will consist of Two sections as per following pattern:

Section-A : The examiner will set 10 questions. Candidate will attempt 7 questions carrying 4 marks in 10-15 sentences each. The total weightage of this Section will be 28 marks.

Section-B : The examiner will set 8 questions which will cover the entire syllabus. Candidate will attempt any 4 questions in at least 4-5 pages each. Each question will carry 18 marks. The total weightage of this Section will be 72 marks.

Suggested Teaching Theory : 2 Hours (Per week)

Total Theory Marks : 100

- Communication, definition, meaning, nature need, Process and Functions.
- Types of Communication (Intrapersonal, Interpersonal, Group and Mass Communication).
- 7 C's of communication, barriers of communication.
- Verbal and Non-verbal Communication.
- Models of Communication : Aristotle, Shannon and Weaver, Wilbur Shramm, Lassewell and Berlo.
- Latest Trend (Internet)
- Invasion of satellite channels.

Books Recommended

Names of the Books	**Author**	**Publishers**
Mass Communication in India	Keval J. Kumar	Jaico, Bombay
Mass Communication, Thoery & Practical	Uma Narula	Harvard, N. Delhi.
Media Communication and Management	C.S. Rayudu	Himalaya

Journalism and Mass Communication

Paper-B

Suggested Teaching Theory - 2 Hours (Per Week)

Total Theory Marks : 100

(Instructions to Mass Communication)

The question paper will consist of two sections as per following pattern :-

Section-A : The examiner will set 10 questions. Candidate will attempt 7 questions carrying 4 marks in 10-15 sentences each. The total weightage of this Section will be 28 marks.

Section-B : The examiner will set 8 questions which will cover the entire syllabus. Candidate will attempt any 4 questions in at least 4-5 pages each. Each question will carry 18 marks. The total weightage of this Section will be 72 marks.

Audio Visual Media

- Development of Radio, T.V., Cinema and Cab
- Le in India over the years.
- Organs of I & B Ministry : FTII,NFAI, DAVP, Field Publicity, Song & Drama Division, Directorate of film festivals, NFDC, RNI, Film division.
- Fundamentals of hardware of electronic Media (Studios, Microphones, Recording equipements editing equipments).
- Print Media, its characteristics (News concept, elements, types, Basics of news reporting, Sources of news, hard and soft news, specialized reporting).
- Audio-visual media, its characteristics.
- Basics of different formats for Radio & TV.

Books Recommended

Name of the Books	**Author**	**Publisher**
Professional Journalism	M.V. Kamath	Vikas
The Journalist's Handbook	-do-	-do-
Here is the News	Rangaswamy Parthasarthy	Sterling Sterling
Basic News Writing	M.Mancher	Universal Book Stall
Journalism-A Guide To Freelancing	R.K. Murthy	Rallance

Mass Communication & Video Production

Paper-I : Introduction to Communication

Total Periods (each paper)	:	130
Theory Total Periods	:	65
Practicals Total Periods	:	65
Theory	:	60 Marks
Practical	:	40 Marks

Time : 3 Hours **Max. Marks : 60**

Instructions for the paper setters :

There shall be three Parts i.e. A, B & C in each

- Part-A consists of 10 questions carrying 2 marks for each question. 10x2=20 Marks
- Part-B consists of eight questions. Candidates have to do any six questions which will carry 4 marks for each question. 6x4=24 Marks
- Part-C consists of four questions and candidates have to do any two questions which will carry 8 marks for each question. 8x2=16 Marks

Question paper will be set in English only but the medium of examination will be English, Punjabi and Hindi.

Communication

* Meaning
* Definition
* Nature
* Need
* Process
* Functions
* Barriers
* 7c's of Communications

Types of Communication

* Intrapersonal Communication
* Interpersonal Communication
* Group Communication
* Mass Communication
* Media Communication

Verbal & Non-Verbal Communication

Traditional & Folk Media

Models of Communication

* Aristotle Model
* Lasswell Model
* Shannon & Weaver Model
* Wilbur Schramm Model
* Berlo's Model
* Gerbner's Model
* Dance's Model

Practicals **Max. Marks : 40**

Training in communication skills, discussions & seminars

Books Recommended

Name	**Author**	**Publisher**
Mass Communication in India.	Kewal J. Kumar	Jaico, Bombay, 2004
Mass Communication Theory & Practice	Uma Narula	Haranand, N. Delhi 1998

Note : Practicals to be conducted by external examiner.

Mass Communications & Video Production

Paper-II

Audio Visual Media

Total Periods (Each Paper)	130
Theory Total Periods	65
Practicals Total Periods	65
Theory	60 Marks
Practical	40 Marks

Time : 3 Hours **Max. Marks : 60**

Instructions for the paper setters:

There shall be three Parts i.e. A, B & C in each

- Part-A consists of 10 questions carrying 2 marks for each question. 10x2=20 Marks
- Part-B consists of eight questions. Candidates have to do any six questions which will carry 4 marks for each question. 6x4=24 Marks
- Part-C consists of four questions and candidates have to do any two questions which will carry 8 marks for each question. 8x2=16 Marks

Question paper will be set in English only but the medium of examination will be English, Punjabi and Hindi.

History & Development of Radio, T.V. Cinema & Cable in India organs of Information & Broadcasting Ministry

- Film & Television Institute of India
- National Film Archive of India
- Directorate of Advertising & Visual Publicity
- Directorate of Field Publicity
- Song & Drama Division
- Directorate of Film Festivals
- National Film Development Corporation
- Registrar of Newpapers for India
- Film Division

Print Media

- Characteristics
- Concept of News
- Elements of News
- Types of News - Steps of Writing News
- Sources of News
- Basics of News Reporting

Audio-visual Media Characteristics
Basics of Different formats for Radio & TV

- How to write for different Radio & TV formats
- Online Journalism

Practicals Max. Marks : 40

Visit to AIR, DD and other media organizations, News Writing, Introduction to basic mechanics of production techniques, script writing for Radio & TV programmes. Computer Practicals

Books Recommended

Title	Author	Publisher
Outline of Reporting	M.K. Joseph	Anmol Publications, 1997
Radio & TV Journalism	Jan R. Hakemulder	Anmol Publications, New Delhi, 1998
Radio & TV Journalism	K.M. Srivastava	Sterling Publications
Annual Report		I & B Ministry

Note : Practicals to be conducted by the external examiner.

Food Science and Quality Control (Vocational) FSQC(I)

Food Chemistry and Nutrition

(Theory)

Time: 3 Hours **Max.Marks : 75**

Instructions for paper-setters

Question paper will cover both the main topics and divided into two parts. Each part contains four questions and students will be asked to attempt five questions in all with at least two from each part.

Part -I

Course Outline: **Lectures**

1. Introduction to nutrition-food as a source of nutrients, function of foods, definition of nutrition, nutrients, adequate, optimum and good nutrition, malnutrition.
2. Inter-relationship between nutrition and health-parameters of good health.
3. Food guide-basic five food groups – Importance, uses.
4. Food Metabolism - digestion, absorption, transport, utilization of nutrients in the body.
5. Water-function, sources, requirement, water balance, effect of deficiency on health.
6. Carbohydrate—composition, classification, food sources, storage in body, reaction, structure, functions of mono,oligo and poly saccharides in foods.
7. Fat and oils—composition, saturated, unsaturated fatty/acids, food sources, functions of fats. Nomenclature classification Physical and chemical properties Emulsions and emulsifiers Role of fat and oil in food processing and its organoheptic characteristics.
8. Proteins—composition essential, non-essential amino acids, sources of protein, functions, protein deficiency diseases.

Physico-chemical properties. Modification of Food protein during processing and storage.

9. Energy—unit of energy, food as a source of energy, calorific value of food need for energy, Basic metabolic role, utilization of fat energy requirement.
10. Minerals, function, source, bio-availability, deficiency of calcium, iron, iodine, fluorine, sodium potassium.
11. Vitamins—classification, sources, functions and deficiency, diseases of following vitamins :-
    a) Fat soluble vitamins - Vitamin. A,D,E & K
    b) Water soluble vitamins: vitamins C & B-Complex
12. Recommended dietary Requirements: Nutrient requirement for adult men & women as per ICMR.
13. Enzymes:

    Nomenclature definition, specificity, catalysis, enzyme, kinetics, Factors influencing enzyme activity, controlling enzyme action. Role of enzymes in food processing, modification of food by endogenous enzyme.

    Enzyme inhabitors in foods.
14. Pigments sources, chemical and physical properties, effect of processing and storage on pigments.
15. Flavours - vegetable, fruits, spice and sea foods fermented products.

Book Recommended :

1. Food Chemistry by O.R. Fennema, 3rd ed, 1996, CRC Press, USA.

Part-II

16. **Cereals & pulses:**

    Cereals and millets, breakfast cereals, cereal products, fast foods structure, processing, use in variety of preparations, selection, variety storage, nutritional aspects and cost. Pulses

& legumes- Production (in brief) selection and variety, storage, processing, use in variety of preparations, nutritional aspects and cost.

17. **Milk and Milk Products :**

    Composition, classification, quality processing, storage, spoilage, uses, cost, nutritional aspects of milk curds, butter milk paneer, khoa, cheese; ice-cream, kulfi and various kinds of processed milk.

18. **Egg:**

    Production, grade, quality, selection storage, spoilage, uses, cost and nutritional aspects.

19. **Fish, poultry and meat:**

    Selection, purchase, storage, uses, cost and nutritional aspects, spoilage of fish, poultry & meat.

20. **Vegetables & fruits:**

    Variety, selection, purchase, storage availability, cost use and nutritional aspects of raw and processed vegetables and fruits.

21. **Fats & oils:**

    Types and sources of fats and oils (animal and vegetable) Processing uses, storage, cost and nutritional aspects.

22. **Sugar & Sugar Products:**

    Different forms of sugar. (sugar, jaggery, honey syrup) manufacture, selection, storage & use preserves.

23. Salt types, uses in the diet:

24. Convienence Foods.

    Tea, coffee, choclate and coca powder.

25. Processing cost and nutritional aspects.

References :

1) Guthrie, hele, andrews, Introductory Nutrition 6th ed. St. Louis, Times Mirror/Mosby College, 1988.

2) Mudambi S.R., M.V. Rajgopal, Fundamentals of Foods and nutritions (2nd ed.) Wiley Eastern Ltd., 1990.

3) Swaminathan S.: Advanced text book of Foods Nutrition Vol. 1,11, (2nd ed. revised & enlarged) B.app.C. 1985)

4) Willson, PVAD, Principles of Nutrition, 4th ed. New York John Willey & Sons, 1979.

5) Food Chemistry, ed. Or Feneema 2nd ed.

6) Food Chemistry, Mian Hoagland Meger

7) Food Chemistry He Mann

Food Science and Quality Control

(Vocational)

FSQC (2) Food Micro Biology

(Theory)

Time : 3 Hours **Max. Marks : 50**

Instructions for paper-setters.

Question paper will cover both the main topics and devided into two parts. Each part will contain four questions and students will be asked to attempt five questions in all with atleast two from each part.

Periods

Part-I

1. Microbiology of air, water, food products. 2
2. The relationship of Microorganisms to sanitation, role of microbiology environmental effects of Microbiology growth. 5

Part-II

3. Other food hazards—chemicals, antibiotics, hormones, metals contamination poisonous foods. 3
4. Importance of personal hygiene of handler—habits-clothes, illness, Education of handler in handling and service food.

   Safety in food procurement, storage, handling and preparation, control of spoilage—safety of left of left owen foods.
5. Cleaning methods—sterlisation and disinfection-products and methods—use of detergents, heat, chemicals tests for sanitiser strength.
6. Sanitation—kitchen design equipment and systems structure and layout of food, presses maintaining clean environment.

   Selection and installing equipment cleaning equipment.

   Waste product handling. Planning for waste disposal.

   Solid wastes and liquid wastes and its treatment.

7.Control of infestation

Rodent Control—Rats, Mice Rodent, profine, destruction, Vector control.

Use of pesticides

8. Food Sanitation, control and inspection—planning and Implementation of training programmes for health personal.

References

1. Jacob, M(1989) Safe Food Handling, training guide for manager, WHD, Geneva, Marriott, N.G., (1989).
2. Principles of Food Sanitation—II Edition, AVI Book, Van Noistrand Reinhold, New York.
3. Hobbs, B.C. and R.J. Gilbert (1978) Food Poisoning and Food Hygiene, 4th Edition. The English Language Book Society and Edward Arnold (Publishers) Ltd.,
4. Longree K. (1967), Quantity Food Sanitation, Interscience Publishers, New York.
5. Kawata, K. (1963), Environmental Sanitation in India, Lucknow Publishers, New York.
6. Minor L.J. (1983) Sanitation, Safety and Environmental Standard AVI Publishing Co., Westport, Connecticut.
7. Frazier, W.C. “Food Microbiology”, 4th ed. 1988. McGraw Hill, New York.
8. Kawata K. “Environmental Sanitation in India” 1963. Lucknow Publ. House.
9. Pelezar H.J. and Rober, “Microbiology”, 2nd ed. 1968, McGraw Hill, New York.
10. Banwart G. T. “Basic Food Microbiology”, 1987, CBS Publ., New Delhi.
11. Jay, J.H., “Modern Food Microbiology,” CBS Pub., New Delhi.

FSQC-3 Food Chemistry and Nutrition (Practical)

Max. Marks : 50

List of Practicals

1. Determination of acid value.
2. Determination of lodine value.
3. Determination of saponification value.
4. Quantitative value (testing of proteins, lipids and carbohydrates in different foods.
5. Estimation of Vitamin C.
6. Separation of aminoacids by chromatography (paper in exchange column).
7. Clorination of water.
8. Determination of food enzymes.
9. Determination of fibres content in food.
10. Salt determination in food products.
11. Estimation of Volatile and nonvolatile acids in vinegar.
12. Estimation of fat in food sample by Soxhlet apparatus.
13. Cream separation, neutralization and ripening of milk.
14. Preparation of butter.
15. Preparation of Ghee.

Food Science and Quality Control

FSQC-4 Food Microbiology

(Practicals)

Max. Marks 25

List of Practicals:-

1. Instruments of microbiology laboratory and their functions.
2. Sterilization techniques
   (a) Dry heat
   (b) Moist heat
   (c) filtration
   (d) Irradiations.
3. Preparation of medias, agar stants, plates, broth.
4. Serial dilution techniques.
5. Cell count by heamocytometer (DMC) in the given food sample.
6. Techniques for isolation and enumeration of micro organisms.
   (a) Culture transfer technique.
   (b) Spread plate technique.
   (c) Steak plate technique.
   (d) Cultural characteristics of microorganisms.
7. Gram Staining of Bacteria.
8. Isolation of amyloytic, Proteolytic & acid producing bacteria from the given sample.
9. To measure the cell size : occularmicrometer and stage micrometer.
10. Bacteriological analysis of water sample.
11. Bacteriological analysis of milk and milk product.
12. Microbial analysis of cereal products.
13. Microbiology of egg.
14. Bacteriological analysis of Tamato products.
15. Microbiology of meat.

Information Technology (Vocational)

Paper-A

Fundamentals of I.T.

Time : 3 Hours

Marks Theory : 75
Practical : 25
Total Marks : 100

Note :

(i) In theory eight questions are to be set giving the weightage to all the portions. The candidates are required to attempt any five. All questions are to be of equal marks.

(ii) The maximum marks for the paper will be 75.

(iii) As for as possible except in the Computer language papers no programme may be asked in theory papers. Emphasis should be on algorithm development.

Fundamentals

Basic Block Diagram of the Computer System, Basic Elements of the Computer System (CPU, Keyboard, Mouse, Monitor). Generations of computers, Computer Number System BIT, Byte, binary, Decimal, Hexadecimal, Octal system, Conversion from one System to another, Binary Artihmetic Substraction, Multiplication), Input Devices (Keyboard, Mouse Joystick, light pen, and trackball). Output Devices (Monitors or Printers), Memories (Primary and Secondary), RAM, PROM, EPROM, EEROM), cache memory, Storage Devices (Floppy disk, hard Disk, compact Disk, tape).

Computer Languages : machine Language, assembly language, High level languages, operating System, Batch Processing multi-programming, time sharing.

Internet

Internet Applications, Domain Name System, Electronic Mail The World Wide Web, Multimedia Audio, Video, Data corporate File transfer Protocol, Mail transfer Protocol, Telnet, HTTP.

Introduction to HTML HTML and the World Wide Web, HTML elements, basic structure of elements, creating HTML pages, viewing pages in different browsers, rules for nesting the HTML tags, color and fonts, formating the body section, creating links, creating external liks, creating internal links, adding graphics with image elements, image element atrributes, using image as links.

Computer Networks, Network Hardware, Network Categorization-LAN, MAN, WAN, OSI & TCP/IP Reference Models, Transmission Media, Wireless Transmission, Communication satellites.

IEEE Standards-802.3 & 802.5, The IP Proticol, TCP & UDP, DNS, SNMP, E-Mail, Usenet.

References

1. D.H. Sanders, "Computers Today", McGraw Hill, 1998.
2. B.RAM, "Computer Fundamental" First Edition, Dhanpat Rai & Sons Pub.
3. Peter Norton, "Introduction to computers" 6th Edition 2004, McGraw Hill, HTML, DHTML Java Script, "Gyan Bayrose" 3rd Edition BPB.

Information Technology (Vocational)

Paper-B

Office Automation and Data Communications

Time : 3 Hours **Marks Theory : 75**

Practical : 25

Total Marks : 100

Instructions for the paper setter

The questions paper will consists of two sections A and B. Each section will contain 7 questions. Student has to attempt 10 questions at least two from each section.

Windows Vista : Windows concepts features, Windows structure, desktop, taskbar, start menu, My computer, recycle bin, Windows Accessories.

Word Processing : MS-Word : Introduction to Word Processing, Toolbars, Ruler, Menues, Keyboard Shortcut, Editing a document, Printing documents, Formating documents, Checking the grammar & Spelling, Formating via find and replace, Using the Thesaurus, Using Auto Correct, Auto Complete and Auto Text, Mail Merge, Wizards and Templates, Handling Graphics, Tables and Charts.

Worksheets : MS-Excell : Creating worksheets, entering data into worksheet heading information, Data text, dates alphanumeric, values, saving & quitting worksheet, opening and moving around in an existing worksheet, Toolbars and menus, keyboard shortcuts, Working with single and multiple workbook, Working with formulae and cell referencing, formatting of worksheet.

MS Power Point : Introduction, elements, Text, Title, Sliders Formating and enchacing text formatting, Creating Graphs, Displaying slide show and adding multi-media.

MS-Access : Introduction, understanding database, creating, tables, queries, forms, reports Adding graph to report.

Practicals

1. **On the basis of Paper-A: Marks 25**
2. **On the basis of Paper-B: Marks 25**

1. M.S. office 2003, The Complete Reference by Keitel, Edition 2004 McGraw Hill.
2. Office XP the Complete Reference by Kelly, Edition 2001, McGraw Hill.
3. Complete Network by Andrew Tanenbaum, 4th Edition, Prentice Hall India.

Electronics
Paper-A

Time : 3 Hours **Max. Marks 50**

Note for examiner/paper setter :

1. Equal weightage should be given to each unit of the syllabus.
2. Question paper should be set strictly according to the syllabus.
3. The distribution of marks is as given below :

Section A : This will consist of 10 (ten) very short answer type questions. All questions will be compulsory. Each question will carry One mark; total weightage of the section being 10 marks.

Section B : This will consist of short-answer questions. The examiner will set Twelve (12) questions and the candidates will attempt eight (8) questions. Each question will carry three marks each, total weightage of the section shall being 24 marks.

Section C : This will consist of essay type questions. The examiner will set four (4) questions and the candidates will be required to attempt two (2). Each question will carry 8 marks each; total weightage of the section being 16 marks.

Note for teacher/student : Minimum number of hours for theory are three (3) = 4x45 minutes per week.

Unit I : Junction Diode and their Application

Atomic structure and energy levels of intrinsic semi-conductors and extrinsic semiconductors. Semiconductor diode, diode under forward bias, Reverse bias, current voltage characteristics, diode breakdown, diode resistance, circuit model of PN diode, ideal diode, rectifier circuits: half wave, full wave, center tap and bridge), filters (shunt capacitor, series inductor, LC filter, filter) zener diode (structure and characteristics), zener regulator. Photo diode, light emitting diode, solar cell and varactor diode.

Unit-II : Transistors

Bipolar Junction Transistor, Characteristics and structure of BJT, transistor amplifying action, CB, CE, CC connection and their comparison, Transistor biasing, need of biasing, biasing circuits (Fixed bias, self-bias, potential divider bias) single stage transistor amplifier, graphical analysis, DC and AC equivalent of amplifier, load line analysis, current and voltage gain of amplifier, small signal transistor model (H parameter, resistance models) Multistage amplifiers, RC coupled amplifiers, transformer coupled amplifier, direct coupled amplifier, Amplifier classification, Distortion in amplifiers.

Unit-III : Field Effect Transistor

Junction Field Effect Transistor (Physical structure, Principle of operation), Metal Oxide Field Effect Transistor (Physical structure, Principle of operation), Complimentary MOSFET (CMOS) (Physical structure only).

Unit-IV : Feedback and Oscillator

Feedback in amplifiers, positive feedback, negtive feedback, Principles of oscillators, types of oscillators, Hartley, Collpit, Crystal Oscillators, RC Phase Shift, Wein Bridge Oscillator.

Recommended Books :

1. Basic Electronics & Linear Circuits by N.N. Bhargava (TMH) Reprint 2002
2. Basic Electronics by B.L. Theraja (S. Chand & Co.), 1998
3. Electronic Design from concept to Reality by M.S. Roders, G.L. Carpenter, Shroff Publishers, Kolkata.

Digital Electronics

Paper-B

Time : 3 Hours **Max. Marks : 50**

Note for examiner/paper setter :

1. Equal weightage should be given to each unit of the syllabus.
2. Question paper should be set strictly according to the syllabus.
3. The distribution of marks is as given below :

Section A : This will consist of 10 (ten) very short answer type questions. All questions will be compulsory. Each question will carry one mark; total weightage of the section being 10 marks.

Section B : This will consist of short-answer questions. The examiner will set Twelve (12) questions and the candidates will attempt eight (8) questions. Each question will carry three marks; total weightage of the section shall be 24 marks.

Section C : This will consist of essay type questions. The examiner will set four (4) questions and the candidates will be required to attempt two (2). Each question will carry 8 marks; total weightage of the section being 16 marks.

Note for teacher/Student : Minimum number of hours for theory are three (3) = 4x45 minutes per week.

Unit I : Binary System

Number system (Decimal, binary, octal, hexadecimal), binary addition and subtraction, negative number represntation, 1's complement, 2's complement of binary number, subtraction using 1's and 2's complement method.

Unit II : Digital Codes

Weighted Codes - Binary Coded Decimal (BCD), Unweighted Codes - Excess-3 Code, Gray Code, Code conversion—binary to BCD, BCD to binary, binary to Gray, Gray to binary, decimal to Excess-3.

Unit III : Boolean Algebra-Logic Gates-Karnaugh Map

Boolean Algebra, Logic Gates, universal property of NAND and NOR gates, Duality theorem, De Morgans' Laws, Minimization using Boolean algebra, Karnaugh mapping (up to 4 variables), SOP and POS form, Don't care terms.

Unit-IV : Combinational logic circuits

Arithmetic and Logic circuits, half adder, full adder, half subtractor, full subtractor, comparator, multiplexer, demultiplexer, encoder, decoder, parity generator and checker.

Books Recommended :

1. Digital Design by Mano M. Morris (PHI), 3rd Edition, 2006
2. Fundamentals of Digital Circuits by A. Anand Kumar, 2004 (PHI)
3. Digital Principles & applications by Leach & Donald (TMH), 6th Edition, 2006
4. Digital Logic Design by Leach/Mal. (McGraw Hill), 2006

Network Theory and Design

Paper-C

Time : 3 Hours **Max. Marks : 50**

Note for examiner/paper setter

1. Equal weightage should be given to each unit of the syllabus.
2. Question paper should be set strictly according to the syllabus.
3. The distribution of marks is as given below :

Section A : This will consist of 10 (ten) very short answer type questions. All questions will be compulsory. Each question will carry one mark; total weightage of the section being 10 marks.

Section B : This will consist of short-answer questions. The examiner will set Twelve (12) questions and the candidates will attempt eight (8) questions. Each question will carry three marks each; total weightage of the section shall be 24 marks.

Section C : This will consist of essay type questions. The examiner will set four (4) questions and the candidates will be required to attempt two (2). Each question will carry 8 marks each; total weightage of the section being 16 marks.

Note for teacher/student : Minimum number of hours for theory are three (3) = 4x45 minutes per week.

Unit-1 : Network Theory (1)

Voltage source, Current source, Dependent source, Independent source, R parameters, L parameters, C parameters, Ohm's law, Kirchhoff's Current law, Kirchhoff's Voltage law, Analysis of one element kind network, loop node variable analysis, source transformations, Duality, Network topology, basic definitions and properties.

Unit-2 : Network Theory (2)

Simple RC, RL, RLC, LC dc and ac circuits, concept of time constant. Effect and evaluation of initial conditions, Characteristics of sinusoidal —average, peak and effective values, Phasor representation, Impedance concept, Active power, reactive and complex power, power factor, Q of coil and capacitor, series resonance, parallel resonance, Bandwidth and selectivity.

Unit-3 : Network Theorems and Transformation

Superposition theorem, reciprocity theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Tellegen's theorem, Transforms of elementary functions like exponential, step, ramp, impulse, sinusoidal etc; partial fraction expansion, evaluation of residues, Initial value theorem and final value theorem, application of Laplace transforms to network analysis, Relation between step response, impulse response and frequency.

Unit-4 : Network Functions

Z, Y, H and ABCD parameters, equivalent circuit in terms of parameters, relationship between parameter sets, parallel and cascade interconnection of two port network function of terminated two port, application of two port parameters to analysis of T, ladder bridged-T and lattice networks.

Books Recommended :

1. Network Analysis & Synthesis by Soni Gupta.
2. Network Analysis & Synthesis by R. Sudhakar.
3. Network Analysis & Synthesis by Van Valkenburg.

Electronics Practical

Time : 3 Hours, 30 Minutes **Max. Marks : 50**

Note :

1. Perform *two experiments at least one from each section*
2. *Minimum hours per week for practical 6.*

Section-A

1. Measurement of (1) voltage (dc and ac); (2) time period of a sinusoidal signal, (3) phase difference, **using a cathode ray oscillocope**.
2. Study of parallel and series resonance circuit (RLC circuit).
3. **Transient Response of RC circuit** :- To students the effect of RC time constant when square wave driving voltages of various time periods are applied across series RC circuit.
4. To verify (1) Thevemis's theorem; (2) Reciprocity theorem; (3) Maximum power transfer theorem. (4) Nortin theorem.
5. To Determine (1) z-parameters; (2) y-parameters;

   (3) h-parameters and (4) ABCD-parameters, of a **two port resistive network**.
6. To Study half-wave and full-wave **rectifiers** with and without filters.
7. To study **transisters** characteristics in common base and common emitter configuration.
8. To study the **FET** characteristics.
9. **Transistors bias stabilization:**- To familizarize with the method of stabilization of operating point of a transistor.

Section-B

10. To study a **single-stage transistor CE amplifier**.
11. To **designs** a transistor voltage **amlifier** having given specifications.
12. To design a regulated power **supply using** Zener diode.

13. To use a **digital trainer** to verify the given Bollean identity.
14. To study the universality of Nand and Nor gates.
15. To form a half adder and a full adder using NAND gates and verify their truth tables.
16. To form a 2 bit comparator using NAND gates.
17. To demonstrate the operation Pb display **BCD** to seven segment display.

Books Recommended:-

1. Basic Electronics and Linear Circuits by : N.N. Bhargava et. al (TMH, New Delhi).
2. Circuits and Systems by K.M. Soni (S.K. Kataria & Sons, New Delhi).
3. Digital Electronics Circuit and System by V.K. Puri (TMH, New Delhi).
4. Digital Design by M. Morris Mano (PHI, New Delhi).

Computer Science

Note : A student who has passed +2 examination under 10+2+3 system of education of a recognised University/Board/Council or any other examination recognised by the University as equivalent there to shall be eligible to offer the subject of Computer Science at the B.A./B.Sc. level.

Only such colleges as have necessary infrastructure of equipment and staff shall admit students to the subject of Computer Science, The infrastructure must be approved by the University as per usual practice.

Scheme of Examination

		Max. Marks	Exam. Hours
Paper-A Theory :	**Computer Fundamental & Programming**	75	3
Paper-B Theory :	**PC Software**	75	3

Theory - 4 hours per week in Paper A & B

Paper-C Practical: Practical based on Paper-A 25 Marks 2 per week

Practical based on Paper-B 25Mark 2 per week

Note :

(i) Practical marks will include the appropriate weightage for proper maintenance of Lab record.

(ii) The students can use only Non Programmable & Non Storage Type Calculator.

Computer Science

Paper-A

Computer Fundamentals and Programming in C

Max. Marks : 75

Note for Paper-Setters :

(i) Eight questions are required to be set giving the weightage to all the portions. The candidate will be required to attempt any five questions. All questions will carry equal marks.

(ii) The maximum marks for the paper will be 75.

(iii) As for as possible except in the computer language papers no programme may be asked in the theory papers. Emphasis should be on algorithm development.

Course Contents :

1. Introduction to computer and its uses : milestones in hardware and software.- batch oriented/Online/real time application.
2. Computer as a system : basic concepts: stored programs, functional units and their inter-relation: communication with the computer.
3. Data storage devices and media: primary storage: storage addressed, and capacity, type of memory: secondary storage; magnetic tape - data representation and R/W : magnetic disc, fixed & removable, data representation and R/W : floppy disc drives. Winchester disc drive, conventional disc drives; Data organization. Compact Disc.
4. Input/Output devices: Key-tape/diskette devices, light pen mouse and joystick, source data automation (MICR, OMR, OCR), screen assisted data entry; portable/hand held terminals for data collection, vision input system.
5. Printed output : Serial, line, page, printers; plotters, visual output; voice response units.
6. Problem Analysis, flowcharts, decision tables, psuedo codes and, algorithms.

Programming Languages C

Fundamentals of C. Data Type, I/O Functions Operations and expressions, Control Statements, Arrays, Functions, Structure and Union.

Books Suggested

(i) Programming with C Languages C. Schaum Series.

(ii) Fundamental of Computer by P.K. Sinha.

(iii) Computer Fundamental and C. Programming by Kalyani Pub.

Computer Science

Paper-B : PC Software

Time : 3 Hours **Max Marks : 75**

Note for Paper-Setters:

(i) Eight questions are required to be set giving the weightage to all the portions. The candidates will be required to attempt any five questions. All questions will carry equal marks.

(ii) The maximum marks for the paper will be 75.

(iii) As per possible except in the computer language paper no programme may be asked in the Theory papers. Emphasis should be on algorithm development.

1. Basics of Windows Vista
   a) The Desktop, the Taskbar
   b) Start menu.
   c) Program, Document, Settings, Find, Help, Run, Shutdown.
   d) About the My Computer Icon.
   e) About the Networking Neighbourhood lcon.
   f) Recycle Bin.
   g) Folders-Creation and Definition.
   h) New Rules for File Names.
   i) Windows Explorer (Definition).
   j) Shortcut Icons with creation and definition.

2. Introduction to MS-Office 2007

3. Introduction to Word (Word for Windows).

1. Introduction to Word.
2. Introduction to parts of a Word Window (Title Bar, Menu Bar, Tool Bar, the Ruler, Status area).
3. Creating New Documents.

4. Opening an Existing Document.
5. To insert a second Document into an open document.
6. Editing a document.
7. Deleting text, replacing text, moving and copying text.
8. Page setup.
9. Margins and Gutters.
10. Changing Fonts and Font Size.
11. To make text bold, italic or underline.
12. Line Spacing.
13. Centering, Right Alignment and Left Alignment.
14. Page Breaks.
15. Headers and Footers.
16. Putting Page Numbers in Headers and Footers.
17. Saving Documents
    Naming World Document.
    Saving in different Formals.
    Saving on different disks.
18. Spell Checking.
19. Printing.
20. Creating a Table Using : the Table Menu.
    Entering and editing text in tables.
    Selecting in tables.
    Adding Rows.
    Changing row heights.
    Deleting rows.
    Inserting Columns.
    Changing Columns and Cell Width.

21. Borders and Shading.
22. Templates and Wizards.
23. Working with Graphics.
24. Drawing Objects.
25. Using Frames to position Objects.
26. Mail Merge.
27. Using Word and Word Documents with other Applications.

5. Introduction to MS-Power Point

1. Introduction to MS Power Point
2. Power Point Elements.

   -Templates.

   -Wizards.

   -Views.

   -Color Schemes.
3. Exploring Power Point Menu.

   -Opening and Closing Menus.

   -Working with Dialog Boxes.
4. Adding text, adding Title, moving text area, resizing text boxes, adding art.
5. Starting a new slide.
6. Starting a Slide Show.
7. Saving Presentation.
8. Printing Slides.
9. Views

   Slide View, Slide Sorter view, notes view, outline view.

10. Formatting and enhancing text formatting.
    a) Formatting.
        * Changing format with a new layout.
        * Using a pick look wizards to change format.
        * Alignment of Text.
        * Working with text spacing.
    b) Enhancing
        * Using Bullets.
        * Changing text font and size.
        * Selecting text style, effect and color.
        * Picking up and applying styles.
11. Creating Graphs.
12. Displaying slide show and adding multi-media.

Syllabus for Practical Paper A & B carrying 25 Marks each.
Practice based on Windows Vista, MS Word 2003, Front Page - Power Point, Ecess, Excel.

Reference : Windows Based Computer Courses by Gurvinder Singh & Rachpal Singh, Kalyani Publishers.

Computer Applications
(Vocational)
Scheme for Computer Applications

Paper			**Max. Marks: 200**
Paper-A		**Computer Fundamentals**	75
Paper-B		**Gul Package**	75
Theory:	**4 hours per week in Paper-A & B**		
Practical	**:**	**I & II**	**25+25**
Practical	**:**	**2 hours per week (each paper)**	

Paper – A
Computer Fundamentals

Time : 3 Hours **Max.Marks : 100**
Theory : 75
Practical : 25

Note for Paper-Setters :

(i) Eight questions are required to be set giving the weightage to all the portions. The candidates will be required to attempt any five questions. All questions will carry equal marks.

(ii) The maximium marks for the paper will be 75.

(iii) As for as possible except in the computer language papers no programme may be asked in the theory papers. Emphasis should be on algorithm development.

1. Elements of a Computer System

1.1 What is a Computer?

1.2 Evolution of Computers their classification and limitations.

1.3 Uses of Computers in moden society (e.g. Weather orecasting, Census, Oil Exploration, Speech Recognition, Banking, Publishing, Accounting, Research, etc.)

1.4 Characteristics of Desktop

1.5 Characteristics of Portables/Laptops

1.6 Introduction to Hardware, Software System S/W, Operating System, Translators, Utilities and Service Programme, Database, DBMS.

1.7 Application Software (user and standard packages)

1.8 Introduction to Programming Languages (C, Pascal, Fortran)

1.9 Programming languages.

2. Input Output Devices

2.1 Input Devices and Functions

* Keyboard and teletypewriter terminals
* Joystick
* Mouse
* Light Pen
* Magnetic Tapes and cassettes
* Magnetic Disks
* Floppy and Winchester Disks
* Optical Marks Reader (OMR)
* Optical Character Reader (OCR)
* Magnetic Ink Character Reader (MICR)
* Punched Cards

2.2 Output Devices and Functions

a) Visual Display Unit (Monitor)

b) Plotters

c) Printers

e) CTD

3. H/W Organisation of a desktop computer

3.1 Introduction to hardware components

3.2 C.P.U. Control Unit, ALU, Registers

3.3 Instruction Characteristic and Instruction Cycle

3.4 Memory

a) RAM - Dynamic RAM, Static RAM

b) ROM-PROM, EPROM, EEPROM

c) Cache, Virtual, Extended and Expanded Memories

3.5 Secondary Memory (Storage devices) with Details of FD, Cluster, FAT, TRACKS

a) Floppy Disk

b) Hard Disk

c) DAT

d) Video or Optical Disk (CD ROM)

e) CTD

4. Standardization of PC-Hardware Devices

4.1 The System Mother Board (Layout, Add-on devices like RAM Chip, Sound Card Ports and their Functions)

4.2 Disk drives (1.2 MB, 1.44 MB, CTD, CD-ROM drives)

4.3 Power supply and Distribution

4.4 Monitors (VDU) - Pixels, Monitor Sizes, Mono, Color, VGA, SVGA

4.5 Printers - Impact and Non-Impact (Character, Line, Page)

4.6 Moderns and its Types

5. Data Representation

6. Introduction to Number Systems and Character Codes

7. Flow Charts

8. Introduction and Development of Programs in "after word programs in C-Data Types, I/O statement, Operators and Expressions, Control Statement, Arrays, Strings, Functions, Structure and Union.

Practical : 25 marks

Computer Applications (Vocational)

Paper-B

Gul Package

Max.Marks : 100
Theory : 75
Practical : 25

Theory : 4 hours per week in Paper A & B
Practical : 2 hours per week (each Paper)
Note :

i) Eight questions are required to be set giving the weightage to all the portions. The candidates will be required to attempt any five question. All question will carry equal marks.

ii) The maximum marks for the paper will be 75.

iii) As for as possible except in the computer language papers no programme may be asked in theory papers. Emphasis should be on Algorithms development.

1. Introduction to Windows

Origin of Windows

a) Parts of Windows Screen (Definition)
The Desk Top; The Windows; Icons

b) Types of Windows
Application Windows
Document Windows

c) Anatomy of a Window
The Title Bar
Minimize and Maximize Button
The Control Box
Scroll Bars, Scroll Buttons, and Scroll Boxes

2. Using the Program Manager

a) What is the Program Manager

b) Six ways to run programs
—From Icons, With Run Command, From File Manager
From DOS Prompt

3. Creating and Using Groups

a) Creating Program Groups
b) Creating Program Icons
c) Adding Application to a Group;
   - Moving a program Icon into a new window
   - Creating own program lcon
   - Creating Icons for individual Documents
   - Deleting Program Icon, Deleting Groups

4. Using File Manager

Starting File Manager

a) Displaying Directory file views
b) Expanding and collapsing directory levels
c) Creating a Directory
d) Deleting a Directory
e) Searching for a Specific File
f) Selecting files in a Directory
g) Opening Documents from the File Manager
h) Printing from the File Manager
i) Moving Files
j) Moving Files and Directories to another disk drives
k) Copying Files
l) Deleting Files
m) Renaming Files and Directories

5. Basics of Windows Vista

a) The Desktop, the Taskbar
b) Start Menu
c) Program, Document, Settings, Find, Help, Run, Shutdown
d) About the My Computer Icon

e) About the networking neighbourhood Icon
f) Recycle bin
g) Folders-Creation and Definition
h) New Rules for File Names
i) Windows Explorer (Definition)
j) Shortcut Icons with creation and definition

Introduction to MS-Office 2003

Introduction to Word (Word for Windows)

1. Introduction to Word
2. Introduction to Parts of Word Window (Title Bar, Menu Bar, Tool Bar, The Ruler, Status Area)
3. Creating New Documents
4. Opening an Existing documents
5. To insert a second document into an open document
6. Editing a document
7. Deleting text, replacing text, moving and copying text
8. Page Setup
9. Margins and Gutters
10. Changing Fonts and Font size
11. To make text bold, Italic or Underline
12. Line Spacing
13. Centering, Right Alignment and Left Alignment
14. Page breaks
15. Headers and Footers
16. Puting Page Numbers in Headers and Footers
17. Saving Documents
    - Naming Word Document; Saving in Different Formats; Saving on Different Disks
18. Spell Checking

19. Printing
20. Creating a Table Using the Table Menu
    - Entering and editing text in tables; Selecting in tables
    - Adding Rows; Changing row heights; Deleting Rows
    - Inserting Columns; Changing Columns and Cell Width
21. Borders and Shading
22. Templates and Wizards
23. Working with Graphics
24. Drawing Object
25. Using Frames, Position Objects
26. Mail Merge
27. Using Word and Word Documents with other Applications

Introduction to MS Power point

Introduction to MS Power point

Power point elements

- Templates; Wizards; Views; Colour Items

Exploring Power Point Menu

- Opening and Closing Menu; Working with Dialog Boxes

Adding Text, Adding Title, Moving Text Area, Resizing Text Boxes, Adding Art.; Starting a New Slide; Starting Slide Show Saving presentation; Printing Slides

Views : Veiw slide sorter view, notes view, outline view.

Formatting and enhancing text formatting

- Formatting; Changing format with a new layout; Using a pick, a look wizards to change format; Alignment of Text; Working with Text Spacing; Enhancing; Using Bullets; Changing text font and size; Selecting Text Style, Effect and Color; Picking up and applying styles.

Creating Graphs

Displaying slide show and adding multi-media.

Practical : 25 Marks

Computer Maintenance

Paper-A

Principle of Electronics

Time : 3 Hours **Max.Marks : 100**

Theory : 75

Practical : 25

Instructions for the Paper Setters :

Eight questions are required to be set giving the weightage to all the portions. The candidate will be required to attempt any five questions. All questions will carry equal marks.

The maximum marks for the paper will be 75.

As for as possible except in the computer language papers no programme may asked in the theory paper. Emphasis should be on algorithm development.

* **Introduction to Electronics :** Voltage Source, Current Source, Electronic Components, CRO, Digital Multimeter.
* **Network Theorems :** Thevenin's Theorem, Maximum Power Transfer Theorem, Norton's Theorem, Power Supplies.
* **Semiconductor Devices :** P-N Junction, Zener Diode, LEDs, Photodiodes, Transistors, Field Effect Transistor, Metal Oxide Field Efect Transistor.
* **Digital Fundamentals :** Number System, Logic Gates, Boolean Algebra.
* **Digital Logic Circuits :** Multiplexers, Demultiplexers, Encoders, Decoders, Flip-Flops, Counters, Shift Registers. Semiconductor Memories.

References

1. Basic Electronics and Linear Circuits : NN Bhargava (TTTI Chandigarh) -Tata McGraw Hill, 2004.
2. Principles of Electronics V.K. Mehta-S. Chand-2004
3. Digital Computers Electronics : Malvino-Tata McGraw Hill 3rd Edition, 1995.

Computer Maintenance

Paper-B

Computer Organization and Assembling

Time : 3 Hours **Max.Marks : 100**

Theory : 75

Practical : 25

Instructions for the Paper Setters :

Eight questions are required to be set giving the weightage to all the portions. The candidate will be required to attempt any five questions. All questions will carry equal marks.

The maximum marks for the paper will be 75.

As for as possible except in the computer language papers no programme may asked in the theory paper. Emphasis should be on algorithm development.

* **Top Level View of Computer Function & Interconnection :** Computer Component, Functions Interconnection Structure, Bus Interconnection.
* **Computer Arithmetic :** ALU, Interger Representation, Integer Arithmetic, Floating Point Representation, Floating Point Arithmatic.
* **Basics Computer Organization & Design :** Instruction Codes, Computer Registers. Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instruction.
* **Micro Programmed Control :** Control Memory, Addressing Sequence, Micro Program Example, Design of Control Unit.
* **CPU :** Stack Organization, Instruction Format, Addressing Modes, Data Transfer and Manipulation, RISC.
* **I/O Organization :** Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt DMA, IOP.
* **PC Assembling :** Introduction of Motherboards, Power Supply, RAM, Drivers, Keyboard Monitor, Processors and assembling the Computer System.

References

1. Computer Architecture : Morris Mano-Pearson Education, 3rd Edition, 1993
2. PC Upgrade & Maintenance Guide : Mark Minasi-BPB Publishers, 15th Edition 2004.

Computer Maintenance

List of Practicals Based on Paper-A **Marks : 25**

1. To Study the Characteristics of P-n junction diodes in forward bias.
2. To Study the Characteristics of P-n junction diodes in reverse bias.
3. To Study the Characteristics of transistor in common base mode.
4. To Study the Characteristics of zener diode.
5. To verify Thevenin's Theorem.
6. To verify maximum power transfer theorem.
7. To verify the truth tables of various logic gates.
8. To verify the truth tables of universal gates and construction of different gates from them.
9. To verify the truth tables of SR and JK flip-flops.

List of Practicals Based on Paper-B **Marks : 25**

1. To study the various I/O devices.
2. To study the power supply system.
3. To study the usage of various tools.
4. To study the techniques of soldering and desoldering.
5. Installation of operating systems and software.
6. PC Assembling & Disassembling.

Refrigeration & Air Conditioning

(Vocational)

Scheme of Examinations

1. (a) Time Allowed **Theory** : 3 Hours

Practical : 3 Hours

(b) Maximum Marks Theory : Paper-A=50

Theory : Paper-B=50

Practical : 50

Practical Internal Assessment : 50

Note : Internal Assessment based on Performance in Practical.

2. Hours for Teaching the Subject : Theory : 6 Hrs.
Hours for Teaching the Subject : Practical : 6 Hrs. per week

Instruction for paper-setters for setting the question-paper Each paper will consist of 3 sections.

Note for Examiner :

The Theory paper is of 50 marks, the distribution of Marks is as given below:-

Section-A : It will consist of 10 very short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry one & half marks i.e. (1½ marks); total weightage of the section being 15 Marks.

Section-B: It will consist of short answer questions with answer to each question upto 2 pages in length. Eight questions will be set by the examiner and 5 will be attempted by the candidates. Each question will carry 3 marks; total weightage of the section being 15 marks.

Section-C: It will consist of essay type question with answer to each question upto 5 pages in length. Four questions will be set by the examiner & candidates will be required to attempt two. Each question will carry 10 marks; total weightage of the section being 20 marks.

Refrigeration & Air Conditioning

(Vocational)

Paper-A

Time : 3 Hours **Max. Marks : 50**

Instructions for paper-setters for setting the question-paper

Note : There will be two papers.

Paper-A	50 Marks
Paper-B	50 Marks

Each paper will consist of 3 Sections.

Note for Examiner :

The Theory paper is of 50 marks, the distribution of Marks is as given below:-

Section-A : It will consist of 10 very short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry one & half marks i.e. (1½ marks); total weightage of the section being 15 Marks.

Section-B: It will consist of short answer questions with answer to each question upto 2 pages in length. Eight questions will be set by the examiner and 5 will be attempted by the candidates. Each question will carry 3 marks; total weightage of the section being 15 marks.

Section-C: It will consist of essay type question with answer to each question upto 5 pages in length. Four questions will be set by the examiner & candidates will be required to attempt two. Each question will carry 10 marks; total weightage of the section being 20 marks.

1. Introduction

Basic concepts & definition Thermodynamics, System properties State process, Cycle, pressure, density specific volume.

First & Second law of Thermodynamics, Processes,

Constant volume, constant pressure, isothermal & isotropic etc.

2. (a) **Work & Heat :** Work, power & energy Heat, sp. Heat, sensible heat Latent Heat of vapour & fusion specific Heat of gases & Units of Heat.

   (b) **Elementry Heat Transfer :** Conduction orneotion, Rediation, Thermal conductivity & phase.

3. **Refrigeration :** Terminology of Refrigeration Definition of "TON" as applied to refrigeration.

   Methods of Refrigeration & applications, Definitions of C.O.P.

   Refrigeration effect & work Input.

4. **Refrigerants :** Introduction, classification of Refrigerant, proporties of Important Refrigerants as (R-II, R-12, R-22, NH_3 etc.)

   Secondary, Refrigerants & brines antifreozer solutions, selection of Refrigerant for required purpose.

5. **Electrical Aspects of Refrigeration and Air Conditioning**:

   Concepts of volt, current, power A.C. & D.C. Operations, code & electrical wiring for practice, Instruments for voltage, current & resistance measurements.

   Single phase motors : Starting, running & Winding current & voltage thermal relays, solenoid values.

6. **Measuring Instruments** : Fundamental & concepts & Principles Ohm's Law measuring instruments as multimeter Megger.

7. Electrical Wiring & Electrical Circuit of Following: Refrigeration, Air Conditioner & Water Cooler.

8. Effect of Refrigerants on Environment. Introduction regarding Environmental friendly refrigerants.

Refrigeration & Air Conditioning

(Vocational)

Paper-B

Theory

Time : 3 Hours **Max. Marks : 50**

Instructions for paper-setters for setting the question-paper

Note : There will be two papers.

Paper-A	50 Marks
Paper-B	50 Marks

Each paper will consist of 3 Sections.

Note for Examiner:

The Theory paper is of 50 Marks, the distribution of Marks is as given below:-

Section-A : It will consist of 10 very short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry one & half marks i.e. (1½ marks); total weightage of the section being 15 Marks.

Section-B: It will consist of short answer questions with answer to each question upto 2 pages in length. Eight questions will be set by the examiner and 5 will be attempted by the candidates. Each question will carry 3 marks; total weightage of the section being 15 marks.

Section-C: It will consist of essay type question with answer to each question upto 5 pages in length. Four questions will be set by the examiner & candidates will be required to attempt two. Each question will carry 10 marks; total weightage of the section being 20 marks.

1. **Air Refrigeration System :** Introduction, Reuersed carnot cycle. Reuersed Brayton or Belt coleman cycle & their C.O.P. Advantages & disadvantages of air.

2. **Vapour Compression System :** Introduction, vapour compression cycle on PV.Ts & PH diagrams. Simple calculations on work done, C.O.P. etc. Factors affecting the performance of vapour compression system, cycle description, C.O.P. Sub cooling super Heating, Multistage cascade system.

   Non-idealities, effects of pressure drop & non-isontropic compression. Calculation of ref. effect, power.

3. **Vapour Absorption System :** Simple absorption cycle, analysis with NH3-Water or Lithium bromide, C.O.P. use of Charts, Electral use system. Comparison of Vapour Compression with Z Vapour absorption system.

4. **Advantages & Application of Vapour :** Compression cycle with reuersed carnot cycle. Advantage & disadvantages of Vapour compression over air refrigeration.

5. **Air Conditioning Cycle :** Psychrometric Processes : Sensible cooling, heatix, dehumidification/humidification etc.Thermal comfort, standard conditions & ventilation Requirements. Types of air conditioning system Direct Expansion, chilled Water Window cycle, package air conditioning split units & conts of plants.

6. **Components of Air Conditioning:-** chillers, coils, blowers, ducts distributor & pumps.

List of Experiments

Time : 3 Hours **Max.Marks : 50**

1. To study the basic tools eg. spanners, cutting & Throading tools, bending tools etc.
2. Cutting, flatting & joining of tubes.
3. Bending of tubes of diff. sizes.
4. Soldering, brazing & pinching of tubes.
5. Cutting of G.I. & Copper tubes.
6. To make diff. types of joints with help of elbows. T's socket etc.

7. To study different types of comp. eg open & sealed type.
8. To study different types of condensers eg. Air cooled & Water cooled.
9. To study the various types of expansion devices. Capillary tube Exp. Values. Thermostatic exp. value.
10. To study pressure & Temp. measuring instruments.

List of Reference Books

S.No.	Tittle	Author	Publisher
1.	Ref & AC	S. Domkundwar	Dhanpat Rai
2.	Ref & AC	S.C. Arora	—do—
3.	A Course in Ref. & A.C.	P.L. Batlaney M. Singh Khurmy	Khanna Publishers Royal Pub.

Automobile Maintenance (Vocational)

Paper-A (Theory)

Time : 3 Hours **Max. Marks : 100**

Periods per week : Theory : 6

Instructions for the paper setters:

Question paper should be set strictly according to the syllabus and preferably in Punjabi.

The language of the paper should be straight and simple Punjabi.

Paper A : Theory shall consist of three parts:

(a) Ten short compulsory questions requiring short replies of five lines each. Each question carries two marks :

Total Marks : 20

(b) Ten questions of six marks each giving to the points replies. Eight questions carrying forty eight marks will be attempted by the candidates.

Total Marks : 48

(c) Two questions of descriptive types to be attempted by the condidates out of set of four questions.

Total Marks : 32

Orientation of the course:

1. **Part-I :** General Introduction to the Automobile :
   Introduction, Light commercial vehicle, Medium & Heavy Commercial vehicle, Main parts of Automobiles, Body, Chassis, Main parts of Chassis, classification of Chassis with respect to fitting of Engines, Wheel Base, Front overhang, Gear overhang, Wheel Track. Long Wheel-base chassis.
2. **Part-II :**
   Shop safety and Tools. Safety in the shop.
   Safety rules.
   Measuring systems and measuring tools.

Shop Hand Tools.

3. **Part-III :** Frames
   Introduction, Types of Frame, Types of sections used in Frame, Chassis Repair. Frameless Integral frame, properties of body of Vehicle, Safety standards for vehicles. Accidental Repair Special tools used for Denting.
4. **Part IV :**
   Automotive Engines, Engine fundamentals
   Piston-Engine Operation, Engine Types
   Engine Constructions, Values and Values Trains
   Engine Measurements and performance.
5. **Part-V :** Automotive Engine Systems
   Automotive Engine fuels
   Automotive fuel exhaust system
   Automotive carburetors
   Carbureted-Fuel-System service
   Diesel Fuel-Injection Systems : Operation and service
   Engine lubrication System : Operation and service
   Engine Cooling system
   Cooling System Service

Automobile Maintenance (Vocational)
Paper-B
Practical

Time : 3 Hours **Period Per week**
Practical : 4
Max. Marks : 80
Internal Assessment : 20
Total : 100

Distribution of Marks :

Three visits to Motor Workshop	-	15
Oral Examination	-	10
Written Test	-	10
Test of Workshop Jobs	-	25
Identification of workshop tools	-	10
Scale Instrument readings	-	10
		80
Internal Assessment	-	20
	Total	**100**

Paper-B : (Practical)

1. Engine dismentling and assembling.
2. Valve Timings.
3. Ignition Timings.
4. Injection Timings.
5. Carburetor dismentling, cleaning and fault diagnosing.
6. Fuel Injection Pump timing with engine.
7. Injector O/H and Testing.
8. Water Pump cooling system and fault diagnosing.

References :

1. Basic Automobile Engineering (Punjabi Edition) — Written by CP Nakra. Published by Dhanpat Rai and Sons, Jalandhar, Delhi.
2. Automotive Mechanics (English Edition) — William H. Crouse. Donald L. Angkin. Published by Tata McGraw-Hill Publishing Company Ltd., New Delhi.

B.Sc. Geography

Scheme

Paper A :	Geophysics-I (General Geology) Total Teaching Hours 70	70 Marks
Paper B :	Geophysics-II (Geodynamics) Total Teaching Hours 70	70 Marks
Paper C :	Lab. Practicals and Field Total Teaching Hours 70 Training	60 Marks

Eligibility : Candidates who have passed 10+2 in all the streams with a minimum of 45% marks are eligible for admission in B.Sc.Geography.

B.Sc. Geography

Paper-A

Geophysics-I (General Geology)

Max. Marks : 70 **Total Teaching Hours : 70**

Pass Marks : 35% **Time Allowed : 3 hours**

Instructions for Paper Setter :

Unit-I

There will be two questions from this unit. Each question will carry Fourteen marks. Only one question is to be attempted.

Unit-II

There will be two questions from this unit. Each question will carry Fourteen marks. Only one question is to be attempted.

Unit-III

There will be two questions from this unit. Each question will carry Fourteen marks. Only one question is to be attempted.

Unit-IV

There will be two questions from this unit. Each question will carry Fourteen marks. Only one question is to be attempted.

Unit-V

There will be Ten questions of small answer type covering the syllabi of all the four units (1-4). Seven questions are to be attempted. Each question will carry two marks.

Unit-I

Rock forming minerals, different type of rock structures; igneous, sedimentary and metamorphic rocks, their formation, metamorphism and charcteristics. Rock weathering, growth and nature of soils.

Unit-II

Structural features : salt domes, plugs, igneous intrusions and volcanic eruptions.

Unit-III

Tectonic features : The classification and criteria for recognition of joints, folds and faults, Various types of joints faults and folds; normal fault, reverse or thrust fault, strike slip, transcurrent or wrench faults.

Unit-IV

The outline of geological formation and the rock types of India. Classification of mineral deposits. Distribution of minerals in India. Harozoic history of the Shivaliks of Himachal Pradesh (India).

Text & Reference Books :

1. Elements of Physical Geology by A. Holmes
2. Geology of India by D.N. Wadia
3. Ore Deposits of India by Gokhale and Rao
4. India's mineral deposits by Krishna Swamy
5. Historical Geology and Stratigraphy of India by Ravinder Kumar

B.Sc. Geography

Paper-B

Geophysics-II (Geodynamics)

Max. Marks : 70 **Total Teaching Hours : 70**

Pass Marks : 35% **Time Allowed : 3 hours**

Instructions for Paper Setter.

Unit-I

There will be two questions from this unit. Each question will carry Fourteen marks. Only one question is to be attempted.

Unit-II

There will be two questions from this unit. Each question will carry Fourteen marks. Only one question is to be attempted.

Unit-III

There will be two questions from this unit. Each question will carry Fourteen marks. Only one question is to be attempted.

Unit-IV

There will be two questions from this unit. Each question will carry Fourteen marks. Only one question is to be attempted.

Unit-V

There will be Ten questions of small answer type covering the syllabi of all the four units (1-4). Seven questions are to be attempted. Each question will carry two marks.

Unit-I

Composition, shape, size, mass and density of the earth. Various discontinuities in the earth. The variation of temperature, density, pressure and elastic parameter with depth in the earth. Seismic waves and interior of the earth. Mineralogical and chemical composition of the crust, mantle and core.

Unit-II

Introduction to geochronology, closed and open system, uranium-lead, thorium-lead and lead-lead method of dating minerals and rocks, Rubidium-strontium, potassium-argon and fission tracks dating of rocks.

Unit-III

Major sources of heat inside the earth since the time of accretion. Radioactive heating in the earth, distribution of long lived radioactive elements in crustal rocks. Measurement of continental and sub oceanic heat flow. Importance of heat flow studies. Thermal history of the earth.

Unit-IV

Concept of plate and plate motion, Types of continental margin, transform faults, triple junction, Geodynamics of Indian plate, Formation of Himalayas.

Text & Reference Books :

1. The solid earth introduction of global geophysics by C. Fowler.
2. Interior of the earth by H.P. Bott.
3. Physics of the earth by F.D. Stacey.
4. Platetectonics and crustal evolution by Kent C. Condie.
5. Earth's age and geochronology by D. York and R.M. Farquhar.
6. Introduction to geophysics by Howell.
7. Geodynamics of India and Pakistan by R.K. Verma.
8. Physics and Geology by Jacobs, Russell and Wilson.

Physics

Paper-A

Mechanics

Time : 3 hours **M.Marks : 50**

Total Teaching Hrs. : 60 **Pass Marks : 35%**

The paper will consist of five units

Unit-I

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-II

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-III

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-IV

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-V

There will be Eight questions of small answer type covering the syllabi of all the four units (I-IV). Five questions are to be attempted. Each question will carry two marks.

Mechanics

Unit-I

Cartesian and spherical polar co-ordinate systems, area, volume, velocity and Acceleration in these systems. Solid angle, various forces in Nature (Brief introduction) centre of mass, equivalent one body problem, central forces, equation of motion under central force, equation of orbit and turning points. Kepler Laws.

Unit-II

Relationship of conservation laws and symmetries of space and time. Inertial frame of reference. Galilean transformation and Invariance. Non Inertial frames, coriolis force and its applications. Variation of acceleration due to gravity with latitude. Focault pendulum. Elastic collision in Lab and C.M. system, velocities, angles and energies, crosss section of elastic scattering, Rutherford scattering.

Unit-III

Rigid Body motion; Rotational motion, principal moments and Axes. Euler's equations, precession and elementary gyroscope concept of stationery universal frame of reference and ether. Michel son-Morley experiment and its result.

Unit-IV

Postulates of special theory of relatively. Lorentz transformations, observer and viewer in relativity. Relativity of simultaneity, Length, Time, velocities. Relativistic Dopper effect. Variation of mass with velocity, mass-energy equivalence, rest mass in an inelastic collision, relativistic momentum & energy, their transformation, concepts of Minkowski space, four vector formulation.

Books Suggested :

1. Mechanics, Berkeley Vol. I by C. Kittle.
2. Mechanics, H.S. Hans & S.P. Puri.

Physics

Paper-B

Vibrations, Wave and EM Theory

Time : 3 hours **M.Marks : 50**

Total Teaching Hrs. : 60 **Pass Marks : 35%**

The paper will consist of five units.

Unit-I

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-II

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-III

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-IV

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-V

There will be Eight questions of small answer type covering the syllabi of all the four units (I-IV). Five questions are to be attempted. Each question will carry two marks.

Vibrations, Waves & E.M. Theory

Unit-I

Simply harmonic motion, energy of a SHO. Compound pendulum. Torsional pendulum Electrical Oscillations Transverse Vibrations of a mass on string, composition of two perpendicular SHM of same period and of period in ratio 1:2 Decay of free Vibrations due to damping. Differential equation of motion, types of motion, types of damping. Determination of damping co-efficient-Logarithmic decrement, relaxation time and Q-Factor. Electromagnetic damping (Electrical oscillator).

Unit-II

Differential equation for forced mechanical and electrical oscillators. Transient and steady state behaviour. Displacement and velocity variation with driving force frequency, variation of phase with frequency, resonance. Power supplied to an oscillator and its variation with frequency. Q-value and band width. Q-value as an amplification factor.

Unit-III

Stiffness coupled oscillators, Normal co-ordinates and normal modes of vibration. Inductance coupling of electrical oscillators. Types of waves, wave equation (transverse) and its solution characteristic impedance of a string. Impedance matching. Reflection and Transmission of waves at boundary. Reflection and transmission of energy. Reflected and transmitted energy coefficients. Standing waves on a string of fixed length. Energy of vibration string. Wave and group velocity.

Unit-IV

Physical interpretation of Maxwell's equations, E.M. waves and wave equation in a medium having finite permeability and permitivity but with conductivity $\sigma=$). Poynting vector, Impedance of a dielectric to EM waves. EM waves in a conducting medium and Skin depth. EM wave velocity in a conductor and anomalous dispersion. Response of a conducting medium to EM waves. Reflection and transmission of EM waves at a boundary of two dielectric media for normal and oblique incidence.

Recommended Books :

1. Fundamentals of Vibrations and Waves by S.P. Puri.
2. Physics of Vibrations and Waves by H.J. Pain.
3. EM waves and radiating systems by Edward C. Jordan and K.G. Balmain.
4. Fields and waves Electromagnetic by David K. Cheng.

Physics
Paper-C
Electricity and Magnetism

Time : 3 hours **M.Marks : 50**

Total Teaching Hrs. : 60 **Pass Marks : 35%**

The paper will consist of five units.

Unit-I

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-II

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-III

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-IV

There will be two questions from this unit. Each question will carry ten marks. Only one question is to be attempted.

Unit-V

There will be Eight questions of small answer type covering the syllabi of all the four units (I-IV). Five questions are to be attempted. Each question will carry two marks.

Electricity and Magnetism

Unit-I

Basic ideas of Vector Calculus Gradient, Divergence, curl and their physical significance. Laplacian in rectangular, cylindrical and spherical coordinates. Coulomb's Law for point charges and countinuous distribution of charges. Electric field due to dipole, line charge and sheet of charge. Electric flux, Gauss's Law and its applications. Gauss's divergence theorem and differential form of Gauss's Law. Green's theorem.

Unit-II

Work and potential difference. Potential difference as line integral of field. Electric potential due to a point charge a group of point charges, dipole and quadrupole moments, long uniformly charged wire, charged disc. Stoke's theorem and its applications in Electrostatic field, curl E=0. Electric fields as gradient of scalar potential. Calculation of E due to a point charge and dipole from potential. Potential due to arbitrary charge distribution and multipole moments. Poisson and Laplace's equation and their solutions in Cartesian and spherical coordinates. Concept of electrical images.Calculation of electric potential and field due to a point charge placed near an infinitely conducting sheet.

Unit-III

Current and current density, equation of continuity. Microscopic form of Ohm's Law ($J=\sigma E$) and conductivity, Failure of Ohm's Law. Invariance of charge. E in different frames of reference. Field of a point charge moving with constant velocity. Interaction between moving charges and force between parallel currents. Behaviour of various substances in magnetic field. Definition of M and H and their relation to free and bound currents. Permeability and susceptibility and their interrelationship. Orbital motion of electrons and diamagnetism.

Unit-IV

Lorentz's force, Definition of B. Biot Savart's Law and its application to long straight wire, circular current loop and solenoid. Ampere's Circuital law and its application. Divergence and curl of B.Hall effect, expression and co-efficient. Vector potential, Definition and derivation, current-density-definition, its use in calculation of charge in magnetic field at a current sheet. Transformation equation of E and B from one frame to another. Faraday's Law of EM induction, Displacement current, Maxwell's equations. Mutual inductance and reciprocity theorem. Self inductance, L for solenoid, Coupling of Electrical circuits. Analysis of LCR series and parallel resonant, circuits Q-factor, Power consumed, power factor.

Books Suggested :

1. Fundamentals of Electricity and Magnetism by Arthur F. Kipp.
2. Electricity and Magnetism, Berkeley Physics Course, Vol. II by E.M. Purcell.
3. Introduction to classical electrodynamics by David Griffith.
4. EM waves and radiating system by Edward C. Jordan and K.G. Balmain.
5. Fields and waves Electromagnetic David K. Cheng

Physics (Practical)

Practical : (90 Hours.) **Total Marks : 50**

General Guidelines for Physics Practical examination :

1. The distribution of marks is as follows :
   (i) One full experiment out of section - A requiring the student to take some data, analyse it and draw conclusions. (candidates are expected to state their results with limits of error) **20 Marks**
   (ii) Brief Theory **05 Marks**
   (iii) One exercise based on experiment or Computer Programming (To be allotted by the external examiner at the time of examination) **10 Marks**
   (iv) Viva-Voce **10 Marks**
   (v) Record (Practical file) **05 Marks**
2. There will be one sessions of 4 hours duration. The paper will have two sessions. Section-A will consist of 8 experiments out of which an examinee will mark 6 experiments and one of these is to be allotted by the external examiner.
3. Section-B will consist of exercises which will be set by the external examiner at the spot. The length of the exercises should be such that any of these could be completed in one hour.
4. The examiner should take care that the experiment allotted to an examinee from Section-A and exercise allotted from Section-B are not dirctly related to each other.
5. Number of candidates in a group for practical examination should not exceed 15.
6. In a single group no experiment be allotted to more than three examiners in any group.

List of experiments

I. Analysis of experimental data :

Objectives

(i) Knowledge of propagation of errors.

(ii) Determination of standard deviation and probable error and their use in expressing the experimental result.

(iii) Familiarity with the method of least square fitting of experimental data to a curve.

(iv) Straight line fitting.

Activities

(i) Exercise on fitting of given data to straight line and calculation of probable error.

Mechanics

II. Rotation

Objectives

(i) Study of rotational motion.

(ii) Establishing relationship between different quantities.

Activities

(i) To study the dependence of moment of inertia on distribution of mass (by noting time periods of oscillations using objects of various geometrical shapes but of same mass).

(ii) To establish relationship between torque and angular acceleration using fly wheel.

III. Elasticity

Objectives

Knowledge of elastic constants and related quantities.

Activities

(i) Study of bending of beams and determination of young's Modulus.

(ii) Determination of Poissons or rubber plastic.

IV : Fluid Flow

Objectives

(i) Concepts of stream flow and viscosity.

(ii) Knowledge of factors affecting the flow of fluid in a capillary.

Activities

(i) To study flow of water through capillary tubes of different length and area of cross section of (at least two each) and calculate coefficient of viscosity.

V One-dimensional Collisions

Objectives

(i) Conservation of linear momentum and kinetic energy in elastic collisions.

(ii) Dependence of fraction of kinetic energy trasferred on the masses of coliding bodies.

(iii) Idea of coefficient or restitution

Activities

(i) To determine energy transfer, coefficient of restitution and verify laws of conservation of linear momentum and kinetic energy in elastic collisions using one dimensional collisions of hanging spheres.

Vibrations, Wave, and EM Thoery

VI. Standing Waves

Objectives

(i) Standing waves on a string and in air.

Activities

(i) Melde's experiment

(ii) Kundt's tube

VII. Compound Pendulum

Objectives

(i) Idea of equivalent simple pendulum.

(ii) Concepts of centre of suspension and oscillation.

(iii) Dependence of time Period on moment of Inertia.

(iv) Radius of gyration.

(v) Determination of gyration.

Activities

(i) Measure time period as a function of distance of centre of suspension (oscillation) from centre of mass, plot relevant graphs, determine radius of gyration and acceleration due to gravity.

(iii) Find the value of g by Caterer's pendulum.

VIII. Torsion Pendulum

Objectives

(i) Idea of torsional vibration, dependence of time period on M.O.I. and restoring torque.

(ii) Modulus of rigidity.

Activities

(i) Measure time period of oscillation of a Maxwell needle and determine modulus of rigidity of the material of a given wire.

IX. Damped Oscillator

Objectives

(i) Study damped oscillations.

(ii) Coefficient of damping, quality factor etc.

Activities

(i) To measure obtain logarithmic decrement, coefficient of damping, relaxation time, and quality factor of a damped simple pendulum.

Electricity and Magnetism

X. Low resistance measurements

Objectives

(i) Inadequacy of Wheatstone bridge to measure low resistance.

(ii) Acquiantance with a method of measuring low resistances.

Activities

(i) To determine low resistance with Carey Fosters Bridge.

XI. Magnetic Field

Objectives

(i) Familiarity with the magnetic field produced by a solenoid.

(ii) Dependence of solenoidal field on number of turns and current.

(iii) Permeability of air.

Activities

(i) To study the magnetic field produced by a current carrying solenoid using a search coil and calculate permeability of air.

XII. Electromagnetic Induction

Objectives

(i) Verification of laws of electromagnetic induction.

Activities

(i) To study the induced e.m.f. as function of the velocity of the magnet.

XIII. Objectives and Activities

(i) Force on a conductor carrying current in a magnetic field.

XIV. LCR Circuits

Objectives

(i) Study of phase relationship between currents nad voltages in ac circuits.

(ii) Concepts of resonance and Q-value.

Activities

(i) Study of phase relationships using impediance triangler for LCR circuit and calculate impedance.

(ii) Resonance in a series and parallel LCR circuits for different R-value and calculate Q-value.

XV. Capacitance

(i) Measurement of capacitance, dielectric constant.

(ii) Concept of time constant and time base circut.

(iii) Knowledge of a-c Bridges.

Activities

(i) Capacitance by flashing and quenching of a neon lamp.

(ii) Measurement of Capacitance, determination of permitivity of a medium air and relative permitivity by de-Sauty's bridge.

XVI. Self Inductance

Objectives

(i) Knowledge of a-c bridges.

(ii) Concept of self inductance.

Activities

(i) To determined I using Anderson Bridge.

XVII. Others

Objectives and Activities

(i) To study the efficiency of an electric kettle heater/element with varying input voltage.

(ii) To study working of an energy meter-calibration etc.

Excercises

Any one exercise based on above given experiments will be allotted by the examiners

OR

from the following exercises

Practical Examination

1. To compare the mass per unit length of two threads using Melde's experiment.
2. To study the working of energy meter.
3. To find the radius of gyration of objects of different geometrical shapes but of same mass.
4. To calibrate the Carey Foster Bridge.
5. Find the impedence of L-C-R circuit.
6. Study the effect on the impedence of the series C-R circuit when resistance is changed.
7. Study the effect of length/radius on the flow of water in a poisewlle's apparatus.
8. To find the depression in the beam by 2 kg. weight by bending beam.
9. Show that time per period of inertia table increases with increase with increase in M.I.

10. Prove that point of suspension and point of oscillation are interchangable in case of compound pendulum.
11. Study the effect on impedence of series L-R circuit when resistance is changes.
12. Show experimentally that value of Q-factor of series L-C-R circuit decreases with increase in resistance.

OR

Computer Based Exercises

1. Elementry FORTRAN programms, flow chart and their interpretation.
2. To print out all natural even/odd numbers between given limits.
3. To find maximum, minimum and range of a given set of numbers.
4. To compile a frequency distribution and evaluate moments such as mean standard deviation etc.
5. To evaluate sum of finite series and the area under a curve.
6. Motion of projectile using computer simulation.
7. Numerical solution of equation of motion.
8. Motion of particle in central force field.

Text and Reference Books :

1. "Mechanical Systems" by B. Sarat et. al.
2. "A Laboratory Mannual of Physics for Undergraduate Classes" by D.P. Khandelwal.
3. "Elements of Statistics" by C.G. Lambe.
4. "Numerical Analysis" by C. Dizon.
5. "Schaum's Outline of Theory and Problems of Programming with FORTRAN" by S. Lipsdutz and A. Poe.
6. Fortran 77 and numerical methods by Xavier.

Chemistry

Paper	Course		Teaching Hrs.
I.	**Inorganic Chemistry**	M.M. 50	60
II.	**Organic Chemistry**	M.M. 50	60
III.	**Physical Chemistry**	M.M. 50	60
IV.	**Laboratory Practicals**	M.M. 50	

6 periods per week

Total = 15 periods/week

Note for the Examiners : (Common Insturctions for three papers)
The question paper shall consist of three parts, as detailed below:

Part-A

It shall consist of 10 very short answer type question (Q.Nos. 1 to 10) from the entire syllabus and the maximum length of each question may not exceed ¼th of a page. Minimum of 3 questions are to be set from each section of the syllabus. Each question will be of 1 mark and the candidate may be asked to attempt all the 10 questions. Marks Allotted : 10

Part-B

It shall consist of 15 short answer type questions (Q.Nos. 11 to 25) from the entire syllabus and the maximum length of each question may not exceed one-half of a page. Five questions are to be set from each section of the syllabus. Each question will be of 3 marks and the candidate may be asked to attempt any 10 questions.

Marks Allotted : 30

Part-C

It shall consist of 3 descriptive type questions (Q.Nos. 26 to 28) from the entire syllabus and the maximum length of each question may not exceed four pages. One question is to be set from each section of the syllabus. Each question will be of 5 marks and the candidate may be asked to attempt any 2 questions.

Marks Allotted : 10

Paper-I - Inorganic Chemistry **60 Hrs. (2 Hrs./week)**

Time : 3 Hrs. M.Marks : 50 **3 Periods/week**

Section-I

I. Atomic Structure **6 Hrs.**

Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, significance of y^1 and y^2 quantum numbers, radial and angular wave functions and probability distribution curves, shapes of s,p,d orbitals. Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements and ions.

II. Periodic Properties **5 Hrs.**

Position of elements in the periodic table; effective nuclear charge and its calculations. Atomic and ionic radii, ionization energy, electron affinity and electronegativity -definition, methods of determination or evaluation, trends in periodic table and applications in predicting and explaining the chemical behaviour.

III. s-Block Elements **6 Hrs.**

Comparative study, diagonal relationships, salient features of hydrides, solvation and complexation tendencies including their function in biosystems, an introduction to alkyls and aryls.

IV. Chemistry of Noble Gases **3 Hrs.**

Chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds.

Section-2

V. Chemical Bonding **20 Hrs.**

(A) Covalent Bond -Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions. BeF_2 BF_3, CH_4, PF_5' SF_6' IF_7; $SnCI_2$, XeF_4 BF_4 $SnC1_6$.Valence shell electron pair repulsion (VSEPR) theory to NH_3, H_3O+, SF_4, CIF_3), ICl_2 and H_2O. MO theory, homonuclear (elements and ions of 1st and 2nd row), and heteronuclear (CN^-, CO^+, NO^-,

CO^+, CN), diatomic molecules, multicenter bonding in electron deficient molecule (Boranes). Percentage ionic character from dipole moment and electronegativity difference.

(B) Ionic Solids -Concept of close packing, Ionic structures, (NaCI type, Zinc blende, Wurtzite, CaF_2 and antifluorite, radius ratio rule and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy and Born-Haber cycle, solvation energy and solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule. Metallic bond- free electron, valence bond and band theories.

(C) Weak Interactions -Hydrogen bonding, Vander Waals forces.

Section-3

VI. p-Block Elements **20 Hrs.**

Comparative study (including diagonal relationship) of groups 13-17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13-16, hydrides of boron-diborane and higher boranes, Borazine, borohydrides, fullerenes, carbides, fluorocarbons, silicates (structural principle), tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalides.

Paper-II

Organic Chemistry-I **60 Hrs. (2Hrs/ week)**

Time : 3 Hrs. **3 Periods/week**

M.M. : 50

Section-1

I. Structure and Bonding **5 Hrs.**

Hybridization, bond lengths and bond angles, bond energy, localized and delocalized chemical bond, Vander Waals interactions, resonance, hyperconjugation, aromticity hydrogen bonding and Inductive and electrometric effects.

II. Mechanism of Organic Reactions **8 Hrs.**

Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents - electrophiles and nucleophiles. Types of organic reactions. Energy considerations. Reactive intermediates -Carbocations, carbanions, free radicals, carbenes, arenes and nitrenes (with examples). Assigning formal charges on intermediates and other ionic species.

Methods of determination of reaction mechanism (product analysis, intermediates, isotope effects, kinetic and stereochemical studies).

III. Alkanes and Cycloalkanes **7 Hrs.**

Isomerism in alkanes, sources, methods of formation (with special reference to Wuriz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids), physical properties and chemical reactions of alkanes.

Mechanism of free radical halogenation of alkanes : orientation, reactivity and selectivity. Cycloalkanes-nomenclature, methods of formation, chemical reactions, Baeyer's strain theory and its limitations. Ring strain in small rings (cyclopropane and cyclobutane), theory of strainless rings. The case of cyclopropane ring : banana bonds.

Section-2

IV. Stereochemistry of Organic Compounds 12 Hrs.

Concept of isomerism. Types of isomerism.

Optical isomerism, elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diasteremers, meso compounds, resolution of enantiomers, inversion, retention and racemization.

Relative and absolute configuration, sequence rules, D & L and R & S systems of nomenclature.

Geometric isomerism-determination of configuration of geometric isomers. E & Z system of nomenclature, geometric isomerism in oximes and alicyclic compounds.

Conformational isomerism-conformational analysis of ethane and n-butane; conformation of cyclohexane, axial and equatorial bonds, conformation of mono substituted cyclohexane derivatives. Newman projection and Sawhorse formulae, Fischer and flying wedge formulae.

Difference between configuration and conformation.

V. Arenes and Aromaticity

Nomenclature of benzene derivatives. The aryl group. Aromatic nucleus and side chain. Structure of benzene : Molecular formula and Kekule structure. Stability and carbon-carbon bond lengths of benzene, resonance structure, MO picture.

Aromaticity : the Huckel rule, aromatic ions.

Aromatic electrophilic substitution-general pattern of the mechanism, role of σ and π complexes. Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel-Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio. Side chain reactions of benzene derivatives.

Methods of formation and chemical reactions of alkylbenzenes, arylbenzenes and biphenyl.

Section-3

VI. Alkenes, Cycloalkenes, Dienes and Alkynes 12 Hrs.

Nomenclature of alkenes, methods of formation, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides, regioselectivity in alcohol dehydration. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes-mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration-oxidation, oxymercuration-reduction. Epoxidation, ozonolysis, hydration, hydroxylation and oxidation with $KMnO_4$. Polymerization of alkenes. Substitution at the allylic and vinylic positions of alkenes. Industrial applications of ethylene and propene.

Methods of formation, conformation and chemical reactions of cycloalkenes.

Nomenclature and classification of dienes : isolated, conjugated and cumulated dienes. Structure of alkenes and butadiene, methods of formation, polymerization. Chemical reactions-1, 2 and 1, 4 additions, Diels-Alder reaction.

Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation, metal-ammonia reductions, oxidation and polymerization.

VII. Alkyl and Aryl Halides 8 Hrs.

Nomenclature and classes of alkyl halides, methods of formation, chemical reactions. Mechanisms of nucleophilic substitution reaction of alkyl halides, SN^2 and SN^1 reactions with energy profile diagrams.

Methods of formation of aryl halides, nuclear and side chain reactions. The addition-elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions.

Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides.

Paper-III

Physical Chemistry-I

Time : 3 Hrs. **60 Hrs. (2 Hrs./Week)**
3 Periods/week
M.Marks : 50

Section-I

I. **Introduction to Mathematical Concepts** **8 hrs.**

Logarithmic relations, curve sketching, linear graphs and calculation of slopes, differentiation of functions like K^n, e^n, X^n, sin x, log x; maxima and minima, partial differentiation and reciprocity relations. Integration of some useful/relevant functions; permutations and combinations, Factorials, Probability.

II. **Evaluation of Analytical Data** **8 hrs.**

Terms of mean and median, precision and accuracy in chemical analysis, determining accuracy of methods, improving accuracy of analysis, data treatment for series involving relatively few measurements, linear least squares curve fitting, Types of errors, standard deviation, confidence limits, rejection of measurements (F-test and Q-test), numerical problems related to evaluation of analytical data.

III. **Liquid State** **4 Hrs.**

Intermolecular forces, structure of liquids (a qualitative description).

Structural differences between solids, liquids and gases. Liquid crystals : Difference between liquids crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.

Section-II

IV. **Gaseous States** **8 Hrs.**

Postulates of kinetic theory of gases, deviation from ideal behaviour, van der Waal's equation of state.

Critical Phenomena : PV isotherms of real gases, continuity of states, the isotherms of van der Waal's equation, relationship between critical constants and van der Waals constants, the law of corresponding states, reduced equation of state.

Molecular Velocities : Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Liquefaction of gases (based on Joule-Thomson effect).

V. **Physical Properties and Molecular Structure 5 Hrs.**

Optical activity, polarization - (Clausius-Mossotti equation), orientation of dipoles in an electric field, dipole moment, induced dipole moment, measurement of dipole moment-temperature method and refractivity method, dipole moment and structure of molecules, magnetic properties-paramagnetism, diamagnetism and ferromagnetism.

VI. **Solutions, Dilute Solutions and Colligative Properties 7 Hrs.**

Ideal and non-ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient.

Dilute solution, colligative properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis, Law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point, Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties.

Abnormal molar mass degree of dissociation and association of solutes.

Section-III

VII. **Colloidal State** **7 Hrs.**

Definition of colloids, classification of colloids. Solids in liquids (Sole) : kinetic, optical and electrical, properties, stability of colloids, protective action, Hardy Schulze law, gold number.

Liquids in liquids (emulsions) : Types of emulsions, preparation. Emulsifiers.

Liquids in solids (Gels) : Classification, preparation and properties, inhibition, general applications of colloids.

VIII. **Chemical Kinetics and Catalysis** **13 Hrs.**

Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction-concentration temperature, pressure, solvent, light, catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions-Zero order, first order, second order, pseudo order, half life and mean life. Determination of the order of reaction-differential method, method of integration, method of half life period and isolation method. Radioactive decay as a first order phenomenon.

Theories of chemical kinetics : Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy.

Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis). Expression for the rate constant based on equilibrium constant and thermodynamic aspects.

Catalysis and general characteristics of catalytic reactions, Homogeneous catalysis, acid-base catalysis and enzyme catalysis including their mechanisms, Michaelis Menten equation for enzyme catalysis and its mechanism.

Chemistry (Practical)

Duration : 3.1/2 hrs. **6 Period/Week**

M.Marks : 50

Inorganic Chemistry : Semi Micro analysis. Cation analysis, Separation and identification of ions from groups I, II, III, IV, V, and VI. Anionic analysis. Four ions with no interference.

Organic Chemistry Laboratory Techniques

Determination of Melting Point

Naphthalene	80-82°C	Cinnamic acid	132.5-133°C
Benzoic acid	121.5-122C	Salicylic acid	157.5-158°C
Urea	132.5-133°C	Acetanilide	113.5-114°C
Succinic Acid	184.5-185°C	m-dinitro benzene	90°C
		P-dichlorobenzene	52°C
		Aspirin	135°C

Determination of Boiling Point

Ethanol 78°C Cyclo Hexane 81.4°C, Benzene-80°C

Toluene 110°C

Crystalisation : Concept of indication of crystalisation. Phthalic acid from hot water (using fluted filter paper & stem less funnel) Acetanilide from boiling water.

Naphthalene from Ethanol

Benzoic acid from water

Physical Chemistry

1. To determine the specific reaction rate of hydrolysis of ethyl acetate catalysed by Hydrogen ions at room temperature.
2. To study the effect of acid strength on hydrolysis of an ester.
   Viscosity, Surface tension (Pure liquids)
3. To study the viscosity and surface tension of CCI_4 glycerine solution in water.

Practical Examination

Paper-A (Evening) 15

1) Inorganic Mixture

2) Melting Point/Boiling point of organic substance 05

Paper-B (Morning)

1) Physical Chemistry experiment 14

Note : Students shall be allowed to tick two experiments out of the three offered. The examiner will allocate one experiment out of two ticked experiments. For all practical examinations books are not allowed.

2) Crystallisation 06

3) Viva-Voce 06

4) Note Book 04

Physical Chemistry (Practical)

Viscosity, Surface Tension (Pure Liquids)

To determine the viscosity and surface tension of CCI_4 and glycerine solution in water.

Practical Examination will be of four hours duration & shall consist of the following questions :

Q. No. 1 Analysis of Inorganic Mixture (Book Allowed) **(16 Marks)**

Q. No. 2 Crystallization of an organic compound and determination of its melting point. **(10 Marks)**

Q. No. 3 Physical Chemistry Experiment **(10 Marks)**

Students shall be allowed the choice to opt for one experiment out of the three offered. The candidate will write theory, short procedure and calculations of that experiment in the next 10 minutes. Note-Books/ Books is/are not allowed during writing.

Q. No. 4 Viva-voce (8 Marks)

Minimum of four questions (2 marks each) be asked on the background of practical course.

Note-Book (6 Marks)

Books Suggested (Theory Courses)

1. Basic Inorganic Chemistry, F.A. Cotton, G. Wilkinson and P.L. Gaus, Wiley.
2. Concise Inorganic Chemistry, J.D. Lee, ELBS.
3. Concepts of Models of Inorganic Chemistry, B. Douglas, D. McDaniel and J. Alexander, John Wiley.
4. Inorganic Chemistry, D.E. Shriver, P.W. Alkins and C.H. Langford, Oxford.
5. Inorganic Chemistry, W.W. Porterfield Addison-Wesley.
6. Inorganic Chemistry, A.G. Sharpe, ELBS.

7. Inorganic Chemistry, G.L. Miessler and D.A. Tarr, Prentice Hall.
8. Organic Chemistry, Morrison and Boyd, Prentice-Hall.
9. Organic Chemistry, L.G. Wade Jr. Prentice-Hall.
10. Fundamentals of Organic Chemistry, Solomons, John Wiley.
11. Organic Chemistry Vol. I, II & III, S.M. Mukherji, S.P. Singh and R.P. Kapoor, Wiley Eastern Ltd. (New Age International).
12. Organic Chemistry, F.A. Carey, McGraw-Hill, Inc.
13. Introduction to Organic Chemistry, Sireitwieser, Heathcock and Kosover, Macmilan.
14. Physical Chemistry, G.M. Barrow, International Student Edition, McGraw Hill.
15. Basic Programming with Application, V.K. Jain, Tata McGraw Hill.
16. Computers and Common Sense, R. Hunt and Shelly, Prentice Hall.
17. University General Chemistry, C.N.R. Rao, Macmillan.
18. Physical Chemistry R.A. Alberty, Wiley Eastern Ltd.
19. The Elements of Physical Chemistry, P.W. Atkins, Oxford.
20. Physical Chemistry Through Problems, S.K. Dogra and S. Dogra, Willey Eastern Ltd.

Books Suggested (Laboratory Courses)

1. Vogel's Qualitative Inorganic Analysis, revised, Svehla, Orient Longman.
2. Vogel's Textbook of Quantitative Inorganic Analysis (revised), J. Bassett, R.C. Denney, G.H. Jeffery and J. Mandham, ELBS.
3. Standard Methods of Chemical. Analysis, W.W. Scott : The Technical Press.
4. Experimental Inorganic Chemistry, W.G. Palmer, Cambridge.

5. Handbook of preparative Inorganic Chemistry, Vol. I & II, Brauer, Academic Press.
6. Inorganic Synthesis, McGraw Hill.
7. Experimental Organic Chemistry, Vol. I & II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.
8. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
9. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
10. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.
11. Experiments in Physical Chemistry, R.C. Das and B. Behra, Tata McGraw Hill.
12. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.
13. Advanced Experimental Chemistry, Vol. I, Physical, J.N. Guru and R. Kapoor, S. Chand & Co.
14. Selected Experiments in Physical Chemistry, N.G. Mukherjee, J.N. Ghosh & Sons.
15. Experiments Physical Chemistry, J.C. Ghosh, Bharati Bhavan.

BOTANY

		Hours of Teaching		Marks	
		Theory	Practical	Theory	Practical
Paper-I:	Diversity of Microbes & Cryptogams	60	100	75	25
Paper-II:	Cell Biology & Genetics	60	100	75	25
	Total	120	200	150	50

Paper-A : Diversity of Microbes and Cryptogams

Max. Marks : 100

Time : 3 Hrs. **Theory : 75**

Practical : 25

Instructions for the Paper Setters :

There will be a total of nine questions. Question No. 1 will be compulsory and will be of short answer-type (3-4 lines). No multiple choice questions, answer of one-word answer type be set. The remaining 8 questions will include two questions from each unit. Candidates will be required to attempt 1 question from each of the 4 units. All questions (including Q. No. 1) will have equal marks.

Unit-I

Algae : General characters, classification and economic importance, important features and life history of Chlorophyceae—Volvox, oedogonium, Voleochaete, Lanthophyceae—Vaucheria; Phaeophyceae—Ectocarpus, Sargassum; Rhodophyceae—Polysiphonia.

Unit-II

Viruses and Bacteria : General account of viruses and mycoplasma; bacteria—structure, nutrition, reproduction and economic importance; general account cyanobacteria. Fungi : General characters, classification and economic importance;

important features and life history of *Mastigomycotina—Pythium Phytophthora; Zygomycotina—Mucor, Ascomycotina—Saccharomyces, Eurotium, Chaetuomium. Peziza; Basidiomycotina—Puccinia, Agaricus; Deuteromycotina—Cercospora. Colletotrichum; general account of Lichens.*

Unit-III

Bryophyta : Amphibians of plants kingdom displaying alternation of generations; structure, reproduction and classification of Hepaticopsida (e.g. *Marchantia*); Anthocerotopsida *(e.g. Anthoceros),* Bryopsida *(e.g. Funaria).*

Unit-IV

Pteridophyta : The first vascular plant; important characteristics of Psilopsida, Lycopsida, Sphenosida and Pteropsida; structure, reproduction in Rhynia, Lycopodium Selaginella. Equisetum, Pteris and Marsilea.

Suggested Readings

1. Dube, H.C., 1990, An Introduction to Fungi, Vikas Publishing House Pvt. Ltd., Delhi.
2. Puri, P., 1980 Bryophyta, Atma & Sons, Delhi.
3. Sharma, O.P., 1992, Text Book of Thallophytes, McGraw Hill Publishing Co.
4. Sharma, O.P. 1990, Text Book of Pteridophyta, McMillan India Ltd.
5. Sharma, P.D., 1991, The Fungi, Rastogi & Co. Meerut.
6. Smith G.M. 1971, Cryptogamic Botany, Vol. II, Bryophytes & Pteridophytes. Tata McGraw Hill Publishing Co., New Delhi.

Suggested Laboratory Exercises

Teachers may select plants/material available in their locality/ institution.

1. Study of the genera included under algae and fungi.
2. Study of morphology, reproductive structures and anatomy of the examples cited in theory under Bryophyta and Pteridophyta.
3. Observation of disease symptoms in hosts infected by fungi, viruses and mycoplasma Section cutting of diseased material and identification of the pathogens as per the theory syllabus.
4. Gram staining of bacteria.

Botany

Paper-B : Cell Biology and Genetics

Max. Marks : 100

Time : 3 Hrs. **Theory : 75**

Practical : 25

Instructions for the Paper Setters

There will be a total of nine questions. Question No. 1 will be compulsory and will be of short answer-type (3-4 lines). No multiple choice questions, answer of one-word answer type be set. The remaining 8 questions will include two questions from each unit. Candidates will be required to attempt 1 question from each of the 4 units. All questions (including Q. No. 1) will have equal marks.

Unit-I

Structure and function of nucleus; Ultrastructure; nuclear membrane; nucleouls.

Extranuclear Genome : Presence and function of mitochondrial and plastid DNA; plasmids.

Structure and function of other organelles : Golgi, ER, peroxisomes, Vacuoles.

Unit-II

Chromosome organization : Morphology; centromere and telomere; chromosome alterations; deletions, duplications, translocations, inversions; variations in chromosome number, aneuploidy, polyploidy; sex chromosomes.

The cell envelopes : Plasma membrane; bilayer lipid structure; functions; the cell wall.

Unit-III

DNA the genetic material : DNA structure; replication; DNA-protein interaction; the nucleosome model; genetic code; satellite and repetitive DNA.

Cell division : Mitosis; meiosis.

Unit-IV

Genetic inheritance : Mendelism; laws of segregation and independent assortment; linkage analysis; allelic and non-allelic interactions.

Gene expression **:** Structure of gene; transfer of genetic informaton; transcription, translation, protein synthesis, tRNA; ribosomes; regulation of gene expression in prokaryotes and eukaryotes; proteins, ID, 2D, and 3D structure.

Genetic variations : Mutations, spontaneous and induced; transposable genetic elements; DNA, damage and repair.

Suggested Readings

1. Gupta, P.K. 1999, A Text-book of Cell and Molecular Biology, Rastogi Publications, Meerut, India.
2. Kleinsmith, L.J. and Kish, V.M. 1995. Principles of Cell and Molecular Biology (2nd edition). Harper Collins College Publishers, New York, USA.
3. Lodish, H., Berk, A., Zipursky, S.L., Matsudaira, P. Baltimoe. D. and Darnell, J. 2000. Molecular Cell Biology, W.H. Freeman & Co., New York, USA.
4. Russell, P.J., 1998, Genetics. The Benjamin/Cummings Publishing Co., Inc., USA.
5. Snustad, D.P. and Simmons, M.J., 2000, Principles of Genetics, John Wiley & Sons, Inc., USA.
6. Wolte, S.L., 1993, Molecular and Cell Biology, Wadsworth Publishing Co., California USA.

Suggested Laboratory Exercises

(Teachers may select plants/material available in their locality/ institutions).

1. To study cell structure from onion leaf peels; demonstration of standing and mounting methods.
2. Comparative study of cell structure in onion cells, Hydrilla

and Spirogyra. Study of cyclosis in Tradescantia Staminal Cells.

3. Study of plastids to examine pigment distribution in plants (e.g. Cassia, Lycopersicon and Capsicum).
4. Examination of electron micrographs of eukaryotic cells with special reference to organelles.
5. Study of electron micrographs of viruses, bacteria, cyanobacteria and eukaryotic cells for comparative cellular organization.
6. Examination of various stages of mitosis and mitosis using appropriate plants material (e.g. onion root tips, onion flower buds).
7. Preparation of karyotypes from dividing root tip cells and pollen grains.
8. Cytological examination of special types of chromosomes : bar body, lampbrush and polytene chromosomes.
9. Working out the laws of inheritance using seed mixtures.
10. Working out the mode of inheritance of linked genes from test cross and/or F2 data.

Suggested Readings (for laboratory exercises)

1. Fukui, K. and Nakayama, S. 1996. Plant Chromosomes; Laboratory Methods, CRC Press, Boca Raton, Florida.
2. Gunning, B.E.S. and Steer, M.W. 1996. Plant Cell Biology; Structure and Function, Jones and Barllett Publishers, Boston, Massachusetts.
3. Harns, N. and Oparka, K.J. 1994. Plant Cell Biology, A Practical Approach. IRL Press, at Oxford University Press, Oxford, UK.
4. Sharma, A.K. and Sharma, A. 1999. Plant Chromosomes; Analysis. Manipulation and Engineering, Harwood Academic Publishers, Australia.

ZOOLOGY

Scheme

Paper	Maximum Marks	Hours or Equivalent Periods per week	Examination duration hr.
PaperA*	75	3 Hours	3 Hours
Paper B**	75	3 Hours	3 Hours
Practical-I (related to Paper A)	25	2¼ Hours	3 Hours
Practical-II (related to Paper B)	25	$2^{1}/_{4}$ Hours	3 Hours

***Paper A : Cell Biology and Biodiversity-I**

Section-I Cell Biology

Section-II Biodiversity-I (Protozoa to Annelida)

****Paper B: Balanoglosics, only external Character and Affinities**

Section-I Ecology and Environmental Biology

Section-II Biodiversity-II(Arthropoda to Hemichordata)

Paper-A : Cell Biology and Biodiversity-I

Examination Time : 3 hrs. **Maximum Marks : 75**

Section-I

Cell Biology

1. Methods in Cell Biology : Principles of light phase contrast and electron microscopes, fixation and fixatives, staining techniques.
2. Organisation of Cell : Extra nuclear and nuclear ultrastructure and functions of cell organelles

   (a) Plasma membrane : Structure, osmosis, active and passive transport, endocytosis and exocytosis.

(b)	Endoplasmic reticulum	:	Structure, types and associated enzymes.
(c)	Mitochondria	:	Structure, mitochondrial enzymes and role of mitochondria in respiration and mitochondrial DNA.
(d)	Golgi Complex	:	Structure and functions.
(e)	Ribosomes	:	Types of ribosomes, their structure and functions.
(f)	Lysosmos	:	Polymorphism and their function.
(g)	Centrosome	:	Structure and functions.
(h)	Nucleus	:	Structure and functions of nuclear membrane, nucleus and chromosomes.

3. An elementary idea of cell transformation in cancer.
4. An elementary idea of cellular basis of immunity.

Section-II

Biodiversity-I (Protozoa to Annelida)

Detailed study of the following animal type:

Protozoa	:	*Amoeba, Paramecium* and *Plasmodium.* Introduction to Parasitic Protozoans.
Parazoa (Porifera)	:	*Sycon*
Cnidaria (Coelentrata)	:	*Obelia*
Platyhelminthes	:	*Fasciola, Taenia*
Aschelminthes	:	*Ascaris,* Parasitic adaptations in Helminthes
Annelida	:	*Pheretima* (earthworm)

Classification upto orders with brief ecological note and economic importance (if any) of the following :

1.	Protozoa	:	*Entamoeba, Trypanosoma, Giardia, Noctiluca, Eimeria Opalina, Vorticella, Balantidium and Nyctotherus.*
2.	Parazoa (Porifera)	:	*Grantia, Euplectella, Hyalonema* and *Spongilla.*
3.	Cnidaria (Coelentrata)	:	*Hydra, Sertularia, Plumularia, Obelia, Ubularia, Bougainvillea, Porpita, Vallela, Physalia, Rhizostoma, Millipora, Aurelia, Alcyonium, Tubipora, Zoanthus, Metridium, Madrepora, Favia, Fungia and Astrangia.*
4.	Platyhelminthes	:	*Dugesia, Schistosoma and Echinococcus*.
5.	Aschelminthes	:	*Ascaris, Oxyuris, Wuchereria.*
6.	Annelida	:	*Nereis, Polynoe, Eunice Arenicola, Aphrodite, Amphitrite, Chaetopterus, Tubifex* and *Pontobdella*.

Note for the paper setters:

- Nine questions are to be set in all.
- **Question No. 1** is compulsory consisting of short multiple answer type questions covering the whole syllabus. It will have 10 parts of 1½ marks each.
- **Three** from section I & five questions/long answers are to be set from sections II. The questions can have sub parts.

Instructions for the students

- **Four** questions/long answers are to be attempted, at least one from section-I and **two** from section-II, the fourth can be attempted from either of the section.

In all, five questions are to be attempted including compulsory one.

Zoology

Paper-B :
Balanoglosis, only external character and affinities

Max.Marks : 75

Examination Time : 3 hrs.

Section-I

Ecology and Environment Biology

Ecology	:	Subdivision and scope of ecology.
Ecosystem	:	Components, ecological energetics, food web, introduction to major ecosystems of the world.
Ecological factors	:	Temperature, light and soil as ecological factors.
Nutrients	:	Biogeochemical cycles and concept of limiting factors.
Ecological Adptations	:	Morphological, physiological and behavioural adaptations of animals in different habitats.
Population	:	Characteristics and regulations of population. Inter and Intra
Specific relationship	:	Competition, Predation, Parasitism, mmensalism and Mutualism.
Biotic community	:	Characteristics, ecological succession, ecological niche.
Natural resources	:	Renewable and nonrenewable natural resources and their conservations.
Environmental degradation	:	Causes, impact and control of environmental pollution.

Section-II

Biodiversity -II (Arthropoda to Hemichordata)
Detailed study of the following animal types :

Arthropoda	:	*Periplaneta* (cockroach), Prawn, Social organizations in insects (honey bee and termite)
Mollusca	:	*Pila*
Echinodermata	:	Asterias (star fish), Exchinoderm larvae
Hemichordata	:	*Balanoglossus*, External characters and affinities.

Classification up to orders with ecological notes and economic importance (if any) of the following :

1. Arthropoda	:	*Peripatus*, Prawn, Lobster, *Cancer* (crab), Sacculina, *Eupagarus* (hermit crab), *Lepas*, *Balanus*, *Apis*, *Lepisma* (silver fish), *Schistocerca* (locust), *Poecilocerus* (ak grasshopper), *Gryllus* (cricket), *Mantis* (praying mantis) *Cicada*, *Forficula* (earwig), Dragon fly, Termite queen, Bug, Moth, Beetle , *Polistes* (wasp), *Bombyx* (silk moth), Millipede, *Scolopendra* (centipede), *Palamnaeus*.
2. Mollusca	:	*Chiton*, *Anodonta*, *Mytilus*, *Ostrea*, *Cardium*, *Pholas*, *Solen* (razor fish), *Pecten*, *Haliotis*, *Patella*, *Aplysia*, *Doris*, *Limax*, *Loego*, *Sepia*, Octopus, *Nautilus* shell and *Dentalium*.
3. Echinodermata	:	*Echinus*, *Cucumaria*, *Ophiothrix* and *Antedon*.
4. Hermichordata	:	*Balanoglossus*.

Note for the paper setters:

- Nine questions are to be set in all.
- **Question No. 1** is compulsory consisting of short/ multiple answer type questions covering the whole syllabus. It will have 10 parts of 1½ marks each.
- **Three** questions from section **I & Five** questions/long answers are to be set from section II. Questions can have sub parts.

Instructions for the students :

- **Four** questions/long answers are to be attempted, at least **one** from section-I and **two** from section-II, the fourth can be attempted from either of the section.
- In all, **Five** questions are to be attempted including compulsory one.

Suggested Readings

1. Alberts, B., Bray, D., Lewis, J., Raff, M. Roberts, K., Watson J.D. Molecular Biology of the Cell, Garland Publ. Inc., New York, 1998.
2. Barnes, R.D., Invertebrates Zoology. W.B. Saunder, Philadelphia, 1999.
3. De Robertis, E.D.P. De Robertis, E.M.F. Cell Biology and Molecular Biology (Eighth Edition), W.B. Saunders Co., Philadelphia, 1995.
4. Dhami, P.S. & Dhami, J. K., Invertebrates, R. Chand & Co., New Delhi, 2001.
5. Odum, E.P., Fundamentals of Ecology, W.B. Saunders Co., Philadelphia, 1995.
6. Kormondy, E.J., Concept of Ecology, Englewood Cliffs, N.J. Prentice Hall Inc., 1975.
7. Kreb C.J., Ecology, Harper & Row, New York, 1982.
8. Pawar, C.B., Cell Biology, Himalaya Publishing House, Bombay, 1999.

Practical-I (Related to Paper-A)

Max.Marks: 25

Examination Time: 3hrs.

I. Classification up to orders with ecological notes and economic importance (if any) of the following animals :

A. Protozoa
(a) Examination of cultures of Euglena and Paramecium.
(b) Slides : *Amoeba, Euglena, Trypanosoma, Noctiluca, Eimeria, Monocystis, Paramecium* (binary fission and conjugation), *Opalina, Vorticella, Balantidium, Nyctotherus* and *Polystomella.*

B. Parazoa
Specimens : *Sycon, Grantia, Euplectella, Hyalonema, Spongilla, Euspongia.*

C. Cnidaria (Coelenterata)
Specimens : *Porpita, Velella, Physalia, Aurelia, Rhizostoma, Metridium, Millipora, Alcyonium.*
(a) *Tubipora, Zoanthus, Madrepora, Favia, Fungia and Astrangia.*
(b) Slides : *Hydra* (W.M.), *Hydra* with buds, *Obelia* (colony and medusa), *Sertularia, Plumularia, Tubularia, Bougainvillea* and *Aurelia.*

D. Platyhelminthes
(a) Specimens : *Dugesia, Fasciola, Taenia, Echinococcus.*
(b) Slides : Miracidium, Sporocyst, Redia, Cercaria of *Fasciola,* scolex and proglottids of *Taenia* (mature and gravid).

E. Aschelminthes (a) *Ascaris* (male and female), *Trichinella, Ancylostoma.*

F. Annelida *Pheretima, Nereis, Heteronereis, Polynoe, Eunice, Aphrodite, Chaetopterus, Arenicola, Tubifex* and *Pontodela*

2. Study of the following permanent stained preparations:
   A. L.S. and T.S. *Sycon,* gemmules, spicules and sponging fibres of a spongin.
   B. T.S. *Hydra* (Testis and ovary region)
   C. T.S. *Fasciola* (Different regions)
   D. T.S. *Ascaris* (Male and Female)
   E. T.S. *Pheretima* (pharyngeal and typhlosolar regions), Setae, septal nephridia, spermathecae and ovary of *Pheretima* (Earthworm).
3. Preparation of the following slides:-
   A. Temporary preparation of *Paramecium* and setae and spermatheca of earthworm.
   B. Preparation of permanent whole mounts (stained in borax carmine) of *Hydra, Obelia, Sertularia, Plumularia* and *Bougainvillea.*
4. Dissection of the following animals:-
   A. *Pheretima* (earthworm): Digestive, reproductive and nervous systems.
5. Cell Biology
   A. Paper chromatography.
   B. Gel electrophoresis through photographs or through research laboratories
   C. Familiarity with TEM & SEM.
   D. Study of different ultra structures of cell organelles through photographs.

Practical-II (Related to Paper-B)

Max. Marks : 25

Examination time : 3hrs.

1. Classification up to orders with ecological notes and economic importance (if any) of the following animals :

   A. Arthropoda : *Peripatus, Palaemon* (prawn), *Lobster, Cancer* (crab), *Sacculina*, *Eupagurus* (hermit Crab), *Lepas, Balanus,* Cyclops, *Daphnia, Lepisma*, *Periplaneta* (cockroach), *Schistocerca* (locust), *Poecilocerus* (ak grasshopper), *Gryllus* (cricket), *Mantis* (praying mantis), *Cicada, Forficula* (earwig), Dragonfly, Termite queen, Bug, Moth, Beetles, Polistes, (wasp), *Apis* (honey bee), *Bombyx, Pediculus* (body louse) Millipede and Centipede, *Palamnaeus* (scorpion), *Araneae* (spider) and *Limulus* (king Crab).

   B. Mollusca : *Anodota*, *Mytilus, Ostrea*, *Cardium, Pholas, Solen* (razor fish), Pecten, *Haliotis, Patella, Aplysia, Doris, Limax, Loligo, Sepia, Octopus, Nautilus* shell (Complete and T.S.), *Chiton, Dentalium.*

   C. Echinodermata : *Asterias, Echinus Ophiothrix, Antedon.*

   D. Hemichordata : *Balanoglossus*.

2. Study of the following permanent stained preparations:

   A. Insect trachea, mouth parts of *Periplaneta* (cockroach)

   B. Radula and osphradium of *Pila*

   C. T.S. Star fish (Arm).

3. Preparation of the following slides:-

A. Mouth parts of *Periplaneta* (cockroach).

B. Radula of *Pila*

C. Appendages of Prawn.

4. Dissection of the following animals:-

A. *Periplaneta* (cockroach): Digestive and nervous systems, mouth parts and trachea.

B. *Pila* : Pallial complex, digestive and nervous systems

5. Ecology :

A. Study of animal adaptation with the help of specimens, charts and models.

B. Study of Zoogeographical regions and their fauna.

C. Study of biotic components of an ecosystem.

D. Study of different types of nests in birds.

E. Study and preparation of Zoogeographical charts.

Notes:

1. Candidates will be required to submit their original note books containing record of their laboratory work (Drawing etc.) Initiated and dated by their teachers at the time of practical examination.
2. Students must be taken out for excursion to the Zoological gardens, sea shores, and hill stations to study habitat and ecology of the animals.

Microbiology

Paper-A

Fundamentals of Microbiology

Time : 3 hours **Max.Marks : 75**

Instruction for the paper setter

There will be a total of nine questions. Question No. 1 will be compulsory and will be of short answer type (3-4 lines). However no multiple choice one-word answer type questions shall be set. The remaining 8 questions will include two questions from each unit. Candidates will be required to attempt one question from each of the four units. They will have to attempt five questions in all and all questions will carry equal marks.

Unit-I

1. **Introduction and Scope of Microbiology:** Discovery of microorganisms, history of microbiology, controversy over spontaneous origin or microorganisms, discovery of anaerobic life, germ theory of fermentation as life without oxygen, germ theory of disease.

2. **Characterization and Identification of Micro-organisms:** Place of microorganisms in living world, Hackel's and Whittaker's system of classification, prokaryotic and eukaryotic cells, characteristics of main groups of microorganisms.

Unit-II

3. **Methods in Microbiology :** Bright field microscopy and its applications, Methods of sterilization, preparation of a culture media, pure culture concept, staining technhiques of bacteria such as simple, negative and differential methods.

4. **Structure of Bacteria:** Fine structure of bacterial cell, cell wall, cell membrane, capsule, pili, flagella, ribosomes, Cytoplasmic inclusions, Bacterial movement, Endospore and physiology of endospore formation.

Unit-III

5. **Nutrition :** Nutritional requirements of microorganisms, nutritional types of bacteria, autotrophs, heterotrophs, parasites, types of culture media, differential media, and selective media enrichment media. Control of microorganisms by physical, chemical and chemotherapeutic agents.

6. **Reproduction and Growth in Microorganisms:** Modes of cell division, growth curve of bacteria, continuous culture, synchronous growth, quantitative measurement of bacterial growth, Effect of various factors on growth of bacteria.

Unit-IV

7. Reproduction and Growth in Microorganisms : Modes of cell division, growth curve of bacteria, continuous, culture, synchronous growth, quantitative measurement of bacterial growth effect of various factors on growth of bacteria, DNA as genetic material.

8. **Clinical Microbiology :** Epidemiology reservoirs and modes of transmission of infectious diseases. Pathogenesis, diagnosis and treatment of common bacterial and viral diseases in humans.

Books Recommended :

1. Pelczar, M.I., Chan, E.C.S. and Krieg, N.R. 1993, Microbiology. Tata McGraw Hill Publishing Co., Ltd., New Delhi.
2. Stanier, R.Y., Ingraham, J.L., Wheelis, M.L. and Painter, P.R. 1986, General Microbiology, MacMillan Education Ltd. Publisher.
3. Powar, C.B. and Dagniwala, H.F. 1992, General Microbiology, Volume I and II, Himalaya Publishing House, Delhi.
4. Sharma, P.D. 1997, Microbiology, Rastogi Publications, Meerut.

Microbiology

Paper-B

Basic Food Microbiology

Time : 3 hours **Max.Marks : 75**

Instructions for paper setter

There will be a total of nine questions. Question No. 1 will be compulsory and will be of short answer type (3-4 lines). However no multiple choice one-word answer type questions shall be set. The remaining 8 questions will include two questions from each unit. Candidates will be required to attempt one question from each of the four units. They will have to attempt five questions in all and all questions will carry equal marks.

Unit-I

1. Food as a substrate for microorganisms, intrinsic and extrinsic factors affecting the growth of various microorganisms in foods. Microorganisms important in food microbiology-bacteria, yeasts and molds, sources of contamination in foods.

Unit II

2. Fermented foods, origin of fermentation as a method of preparing indigenous foods, bread, dosa idli, warri, temper miso.

Unit-III

3. Principles of food preservation and spoilage, asepsis, anaerobic conditions, aseptic packaging, preservation methods, high temperature, low temperature, drying, chemical preservatives.

Unit-IV

4. Spoilage of various milk and milk products, cereal and cereal products, vegetable and fruits, meat and meat products, canned foods. Food poisoning and food infection. *Staphylococcal, Clostridium* and *Salmonella* intoxications.

Books Recommeded

1. Frazier. W.C. and Westhoff, D.C. 1978, Food Microbiology, Tata McGraw Hill Publishing Co., Ltd., New Delhi.
2. Banwart, G.J., 1987, Basic Food Microbiology, CBS Publishers and Distributions, New Delhi.
3. Powar, C.B. and Dagniwala, H.F. 1992. General Microbiology Volume II. Himalaya Publishing House, New Delhi.

Microbiology Practicals-I

Time : 4 Hours **Max. Marks : 50**

1. To study the essentials of a Microbiology laboratory.
2. To study various parts of a laboratory microscope.
3. To study various sterlization techniques.
4. To prepare the cultures media for the cultivation of various microorganisms.
5. To study various laboratory techniques for the cultivation and isolation of pure cultures of microorganisms.
6. To perform the simple staining of bacterial cell.
7. To perform the differential staining of bacterial cell.
8. To study the typical growth curve of bacteria.
9. To enumerate the total microbial cells in a suspension by serial dilution and pour plating.
10. To enumerate the total bacteria in milk by direct microscopic count.
11. To measure the size of microbial cells by ocular micrometer.
12. To study the morphology of bacteria, yeasts and molds.
13. To check the bacteriological quality of raw milk by methylene blue reduction test.

Industrial Microbiology

(Vocational)

Paper-A

Introduction to Microbiology

Time : 3 hrs **Max. Marks: 75**

Instructions for paper setter

There will be a total of nine questions. Question No. 1 will be compulsory and will be of short answer type (3-4 lines). However no multiple choice one-word answer type questions shall be set. The remaining 8 questions will include two questions from each unit. Candidates will be required to attempt one question from each of the four units. They will have to attempt five questions in all and all questions will carry equal marks.

Unit-I

1. Introduction and scope of microbiology: Historical background of Microbiology (In brief). Difference between prokaryotic and eukarotic microorganisms.

2. Methods in Microbiology. Bright field microscopy and its application in Microbiology, Methods of sterilization, concept of media and its preparation i.e. broth, solid and semisolid, Staining of bacteria Simple and Gram's staining to differentiate G(+) and (G-) bacteria. Isolation of pure cultures using techniques like pour plating, streaking, spreading and serial dilution. Maintenance and preservation of cultures and culture collections.

Unit-II

3. Morphology and basic structure of bacteria, Fungi and Virus. Life cycle of bacteria, yeast, fungi and virus.

4. Reproduction and growth in microorganisms, Mode of cell division, Growth Curve of bacteria, continuous and synchronous culture, Quantitative measurement of bacterial growth, Effect of various factors on growth of bacteria. Control of microorganisms by physical methods.

Unit-III

5. Basic concepts of microbial genetics (In brief). Structure of DNA, RNA and protein, replication, transcription and translation. Concept of gene and mutations.

Unit-IV

6. Clinical microbiology : Epidemiology, reservoirs and mode of transmission of infectious diseases. Pathogenesis, diagnosis and treatment of common bacterial and viral diseases in man.

Books Recommeded

1. Pelczar, M.I., CJam, E.C.S. and Krieg, N.R. 1993, Microbiology. Tata McGraw Hill Publishing Co., Ltd., New Delhi.
2. Stanier, R.Y., Ingraham, J.L., Wheelis, M.L. and Painter, P.R. 1986, General Microbiology, MacMillan Education Ltd. Publisher.
3. Powar, C.B. and Dagniwala, H.F. 1992, General Microbiology, Volume I and II Himalaya Publishing House, Delhi.
4. Sharma, P.D. 1997, Microbiology, Rastogi Publications, Meerut.

Industrial Microbiology

(Vocational)

Paper-B

Introduction to Food Microbiology

Time : 3 hours **Max.Marks : 75**

Instructions for paper setter

There will be a total of nine questions. Question No. 1 will be compulsory and will be of short answer type (3-4 lines). However no multiple choice one-word answer type questions shall be set. The remaining 8 questions will include two questions from each unit. Candidates will be required to attempt one question from each of the four units. They will have to attempt five questions in all and all questions will carry equal marks.

Unit-I

1. Food as a substrate for microorganisms, intrinsic and extrinsic factors affecting the growth of various microorganisms in foods.

Unit II

2. Microorganisms important in food microbiology : bacteria, yeast and molds, sources of contamination in foods.

3. Fermented foods, fermentation as a method of preparing indigenous foods, bread, dosa idli, warri, soy sauce, miso.

Unit-III

4. Principles of food preservation and spoilage, asepsis, anaerobic conditions, aseptic packaging, preservation methods, high temperature, low temperature, drying, irradiation and chemical preservatives.

Unit-IV

5. Spoilage of various milk and milk products, cereal and cereal products, vegetable and fruits, eggs, canned foods and meat and meat products.

6. Food polsoning and food infection. Staphylococal Chlostridrium and Salmonella intoxication.

Books Recommended

1. Jay, J.M. 1986, Modern Food Microbiology, 3rd edition, an Nostrand Reinhold.
2. Banwari, G.J., 1989, Basic Food Microbiology, CBS Publishers and Distributions, New Delhi.
3. Frazier, W.C. and Westhoff, D.C. 1995, Food Microbiology, Tata McGraw Hill Publishing Co., Ltd., New Delhi.

Practicals (Fundamental and Food Microbiology)

Time : 4 Hours **Max. Marks : 50**

1. To study the essential of a Microbiology laboratory.
2. To study various part of a laboratory microscope.
3. To study various sterilization teachniques.
4. To prepare thje culture media for the cultivation of various micro-organisms.
5. To study various labortory techniques for the cultivation and isolation of pure culture of micro-organisms.
6. To perform simple staining of bacterial cell.
7. To perform the differential staining of bacterial cell.
8. To enumaerate the total number of bacteria by direct microscopic count.
9. To measure the size of microbial cell by ocular micrometer.
10. To study the morphology of bacteria, yeast and molds.
11. To check the bacteriological quality of raw milk of methlene the reduction test.

Scheme of Courses for Biotechnology (Vocational)

	Title	Credit Hours	Marks
Paper-A	Cell Biology and Genetics	**2**	**40**
Paper-B	Computer and Mathematics (with Computer Lab.)	**2**	**40**
Paper-C	Biochemistry and Microbiology	**2**	**40**
Paper-D	Practicals		
	Biochemical and Microbiological Techniques	**6**	**60**
	On Job Training	**-**	**20**
		Total	**200**

Biotechnology

Paper-A

Cell Biology and Genetics

Time : 3 hrs. **Periods : 2**

Marks : 40

Note for the paper setters/examiners:

Each question paper will consist of three sections as follows:

Section-A: 8 very short answer questions are to be set. The maximum length of answer can be about 1/3 of a page. All questions are compulsory. Each question will carry one mark, total weightage being 8 marks.

Section-B : This section will comprise of 8 questions. Five questions to be attempted and maximum length of answer can be upto two pages. Each question will carry four marks, total weightage being 20 marks.

Section-C : This section will comprise to four essay type questions. Two questions to be attempted. Maximum length of answer can be upto 5 pages. Each question will carry 6 marks, total weightage being 12 marks.

Cell Biology

Unit-I

Cell as a basic unit of living systems. The cell theory: Precellular evolution: artificial creation of 'cells.' Broad classification of cell types : PPLOs, bacteria, eukaryotic microbes, plant and animal cells. A detailed classification of cell types within an organism. Cell, tissue, organ and organism as different levels of organization of otherwise genetically similar cells. Ecological amplitude of cells in high altitude, sediments, arctic, hotspring, arid, brackish and fresh water environments.

Unit-II

Ultrastructure of the cell membrane.

Structure and function of cell organelles; ultrastructure of cell membrane, cytosol, Golgi bodies, endoplasmic reticulum (rough and smooth), ribosomes; cytoskeletal structures (actin, microtubules etc.) Mitochondria, chloroplasts, lyposomets, peroxysomes, nucelus (nuclear membrane, nucleoplasm, nucleolus chromatin). Cell division and cell cycle (incl. cell synchrony and its applications); Cell-cell interaction; Cell locomotion (amoeboid, flagellar and ciliar). Musle and nerve cells; Cell senescence and death; Cell differentiation in plants and animals.

Genetic

Unit-III

Mendelian laws of inheritance; gene interactions. Sex determination in plants and animals, sex-linkage, non-disjunction as a proof of chromosomal theory of inheritance. Linkage; mapping genes; interference; coincidence in pro and eukaryotes.

Unit-IV

Chromosomes: chemical composition; structural organization of chromatids, centromeres, telomeres, chromatin, nucleosome organisation; eu-and heterochromatin; special chromosomes (e.g., polytene and lampbrush chromosomes; banding patterns in human chromosomes. Structural and numerical aberration involving chromosomes; evolution of wheat, cotton and rice; Hereditary defects- Kleinefelter, Turner, Cri-du-Chat and Down syndromes.

Unit-V

Mutations-spontaneous and induced; chemical and physical mutagens; induced mutations in plants, animals and microbes for economic benefit of man. Basic microbial genetics, conjugation, transduction, transformation, isolation of auxotrophs, replica plating techniques, analysis of mutations in biochemical pathways, one gene-one enzyme hypothesis.

Extrachromosomal inheritance, mitochondrial and chloroplast genetic systems.

Population genetics : Hardy-Weinberg equilibrium, gene and genotypic frequencies.

Books Recommended

1. De-Robertis, F.D.P. and De-Robertis Jr. E.M.F. (1991), Cell and Molecular Biology, Saunders, Philadelphia.
2. Maloy, S.R. Crown, J.E. and Freifelder, D. (1994), Microbial Genetics : 2nd edition, Jones & Bartlett Publishers.
3. Hartl. D.L. (1994), Genetics : 3rd edition, Jones & Bartlett Publishers.
4. Lodish, H., Baltimore, D., Berk, A., Zipursky, S.L., Matsudaria, P and Darnell, J. (1995), Molecular Cell Biology, 3rd Edition, Scientific American Books Inc.
5. Brooker, R.J. (1999), Genetics: Analysis and Principles, Jim Green.
6. Antherly A.G., Girton. J.R. (1999). The Science of Genetics. Harcourt College Publishers.
7. Freifelder, D. (2000), Microbial Genetics, Narosa Publishing House.
8. Geoffrey, M. (2000), The Cell : A Molecular approach, 2nd edition, ASM Press.
9. Hartl, D.L., Jones E.W., (2001). Genetics : Analysis of Genes & Genomes, 5th edition Jones & Bartlett Publishers.

Biotechnology

Paper-B

Computer and Mathematics

Time : 3 hrs. **Periods : 2**

Marks : 40

Note for the paper setters/examiners :

Each question paper will consist of three sections as follows:

Section-A: 8 very short answer questions are to be set. The maximum length of answer can be about 1/3 of a page. All questions are compulsory. Each question will carry one mark, total weightage being 8 marks.

Section-B : This section will comprise of 8 questions. Five questions to be attempted and maximum length of answer can be upto two pages. Each question will carry four marks, total weightage being 20 marks.

Section-C : This section will comprise of four essay type questions. Two questions to be attempted. Maximum length of answer can be upto 5 pages. Each question will carry 6 marks, total weightage being 12 marks.

Maths

Unit-I

The set theory properties of subsets.

Linear and geometric functions.

Limits of functions, derivatives of functions.

Unit-II

The binomial theorem

Logarithm

Differentiation

Integration

Unit-III

Probability calculations

Methods of sampling, confidence level

Measurement of central tendencies

Measurement of deviations

Computers

Unit-IV

Computers : General introduction to computers, organization of computers, digital and analogue computers, computer algorithm. Computers in on line monitoring and automation.

Unit-V

Application of computers in co-ordination of solute concentration. pH and temperature etc. of a fermenter in operation. Demonstration of the above utilities (alongwith the above lectures).

Biotechnology

Paper-C
Biochemistry and Microbiology

Periods : 2

Time : 3 Hours **Marks : 40**

Note for the paper setters/examiners :

Each question paper will consist of three sections as follows:

Section-A: 8 very short answer questions are to be set. The maximum length of answer can be about 1/3 of a page. All questions are compulsory. Each question will carry one mark, total weightage being 8 marks.

Section-B : This section will comprise of 8 questions. Five questions to be attempted and maximum length of answer can be upto two pages. Each question will carry four marks, total weightage being 20 marks.

Section-C : This section will comprise to four essay type questions. Two questions to be attempted. Maximum length of answer can be upto 5 pages. Each question will carry 6 marks, total weightage being 12 marks.

Biochemistry

Unit-I

Nature of biological material; Suitability of organic compounds for generation of structure, storage of energy and information; Hydrophilic and hydrophobic groups in biological molecules.

Classification of biomolecules based on their role in bioprocesses

(i) Molecules involved in generation of mechanical stability-pepetidoglycans, polysaccharides and membrane lipids.

(ii) Molecules involved in information storage and retrieval-the nucleic acids.

(iii) Molecules executing mediator and catalytic functions-the proteins.

(iv) The signal molecules.

Unit-II

Perspectives of biological macromolecules : the repeating units in nucleic acids and proteins. Helicity, bending, looping, pleats, salt bridges etc. and their determinants. The basis for intermolecular interaction e.g. enzyme-substrate and antigen-antibody recognition. Nature of biochemical reactions underlying biosynthesis and degradition. Role of enzymes in such reactions. Protein and non-protein enzymes. Kinetics of enzyme catalysed reactions.

Unit-III

In vitro activity of purified enzymes and their applications in industry. Various uses of enzymes-enzymes in food processing, medicine, diagnostics and production of new compounds. Enzymes as research tools-ELISA methods, modifications of biological compounds with the help of enzymes.

Microbiology

Unit-IV

Development of microscopy (optical, TEM and SEM); Pasteur's experiments disproving spontaneous generation; The concept of sterilization. Methods of Sterilization (Dry heat, wet heat, radiation., chemical and filteration etc.) Concept of microbial species and strains; The various forms of microorganisms-PPLOs-cocci, bacilli and spirilla; Genetic homogeneity in clonal populations; Spontaneous and induced variation arising in microbial population; Gene transfer in microorganisms.

Nature of the microbial cell surface. Gram positive and gram negative bacteria. Kinds of flagella. Serotypes; Prokaryotic and eukarotic microbial cells.

Unit-V

Nutritional classification of microorganisms; Microbes in extreme environments—the thermophiles and alkalophiles; Pathogenic microorganisms. Defence mechanism against micro-organisms; Symbiosis and antibiosis among microbial populations; N_2-fixing microbes in agriculture.

Microbial metabolism; Fermentation products; A survey of products from micro-organisms; Strain improvement by enrichment, selection and recombinant DNA methods; Production of heterologous proteins of interest in micro-organisms.

Books Recommmended

1. Rawn, J.D. (1989), Biochemistry, Neil Patterson Publishers.
2. Davis, B.D. Dulbecco. R., Eisen, H.N. and Ginsberg, H.S. (1990), Microbiology : 4th edition, Harper & Row, Publishers. Singapore.
3. Lehninger, A.L., Nelson, D.L. and Lox, M.M. (1993), Principles of Biochemistry, CBS Publishers and Distributors, New Delhi.
4. Tortora, G.J., Funke, B.R. and Case, C.L. (1994). Microbiology : An introduction : 5th edition, The Benjamin/Cummings Publishing Company, Inc.
5. Stryer, L. (1995), Biochemistry : 4th Edition, W.H. Freeman and Company, New York.
6. Zubay, G.L., Parson. W.W. and Vance, D.E. (1995). Principles of Biochemistry : S Student Study Art Notebook, Wm. C. Brown Publishers.
7. Stanier, R.Y. (1995), General Microbiology, MacMillan Press, London.
8. Pelezar, M.T. (1995), Microbiology, Tata McGraw Hill Publication, New Delhi.
9. Schlegel, H.G. (1995), General Microbiology, 7th edition, Cambridge Univ. Press.
10. Prescott and Dunn (1999), Industrial Microbiology, 4th edition. By S.K. Jain for CBS Publishers & Distributors.

11. Bucke C., (1999), Carbohydrate Biotechnology Protocols, Humara Press.

12. Purohit, S.S. (2000), Microbiology ; Fundamentals and Applications (6th edition), Agrobios (India).

13. Postage, J. (2000), Microbes & Man, 4th edition, Cambrige Univ. Press.

14. Tortora, G.J., Funke, B.R., 2001, Microbiology : An Introduction, Benjammin Cummings.

15. Horton et al., (2001), Principles of Biochemistry, Prentice Hall.

Biotechnology

Paper-D

Practicals : Biochemical and Microbiological Techniques

Periods : 6

Time : 3 Hours **Marks : 60**

Biochemistry Techniques

Verification of Beer Lamberts for P-nitrophenol or cobalt chloride.

Determination of pKa value of p nitrophenol

Quantitative estimation of the following in biological samples

Sugar in given solutions

Sugar in biological samples

Extractions and separation of lipids

The determination of acid value of a fat

Estimation of proteins

Estimation of DNA/RNA

Microbiological Techniques

Aseptic techniques

Cleaning of glassware

Preparation of media, cotton-plugging and sterilization

Personal hygiene-Microbes from hands, tooth-scum and other body parts.

Isolation of microorganisms from air, water and soil samples. Dilution and pour plating. Colony purification.

Enumeration of micro-organisms. Total vs. viable counts.

Identification of isolated bacteria. Gram staining, other staining methods, metabolic characterization (e.g. IMViC test)

Growth curve of microorganisms.

Antibiotic sensitivity of microbes, use of antibiotic discs.

Testing of water quality.

One step growth of bacteriophage.

Alcoholic and mixed-acid fermentation

Books Recommended

1. Bansal, D.D., Khardori, R. & Gupta, M.M. (1985), Practical Biochemistry, Standard Publication, Chandigarh.
2. Pulummer D.T. (1990), An Introduction of Practical Biochemistry, 3rd Ed. Tata McGraw Hill Publishers Co. Ltd., New Delhi.
3. Cappucin J.G. and Sherman, N. (1992), Microbiology: A Laboratory Manual, 3rd edition, Benjamin/Cummings Publishing Company, Inc.

On Job Training

Marks : 20

The students should be assigned to assist a clinic (in a hospital), a fermentation plant, brewery of bakery and watch the various stages in brewing and baking and post fermentation processing.

Prior arrangements must be made of the mode of interaction of the educational institutions with the clinic and the industry.

Scheme of Courses for Bioinformatics (Vocational)

Part-I

Title		Credit Hrs.	Marks
Paper-A	Basic Math & Biostatistics	2	40
Paper-B	Fundamentals of Computers, Web Technology and Networking	2	40
Paper-C	Basic Molecular Biology & Introductiont to Bioinformatics	2	40
Paper-D	Introduction to Database Mgt. Systems	2	40
Paper-E	Lab in Databases Management, Computer Fundamentals, Web Technology	6	40
		14	**200**

Bioinformatics (Vocational)

Paper-A

Basic Mathematics and Biostatistics

Time : 2 Hrs. **M.M. : 40**

Note for the paper setter/examiners :

Each question paper will consist of three sections as follows :

Section A: 8 very short answer questions are to be set. Two from each unit. The maximum length of answer can be about 1/3 of a page. All questions are compulsory. Each question will carry one mark, total weightage being 8 marks.

Section B: This section will comprise of 8 questions. Five questions to be attempted and maximum length of answer can be upto two pages. Each question will carry four marks, total weightage being 20 marks.

Section-C: This section will comprise of four essay type questions. Two questions to be attempted. Maximum length of answer can be upto 5 pages. Each question will carry 6 marks, total weightage being 12 marks.

Mathematics:

Unit-I

- Calculus: Limits, complete differentials, partial differential of function with one variable and multiple variables.
- Integration: definite and non definite integrals, series,logarithms.

Unit-II

- Ordinary differential equations (first order). Partial differential equations- example from biology.
- Equation of line, circle, ellipse, parabola, hyperbola, sphere and cone.
- Trigonometric function: Sine, cos, tan, cot, series expansion of these functions and related functions.

Unit-III

- Vector: Addition, subtraction, dot product, cross product, scalar triple.
- Algebra: Addition, subtraction, multiplication, transfer inverse and conjugate of matrix
- Matrices and determinants

Biostatistics

Unit-IV

- Introduction to the principle of statistical sampling from a population.
- Mean, median, mode, variance, covariance, normal chi square, student's T and Gumble test.
- Correlation, regression

Unit-V

- Probability: Basic concepts, sample space and events, use of counting method in probability, addition law, sample problems involving the estimation of probabilities, probability distribution.
- Multiple variable analyses: Hypothesis testing.
- Normal Distribution: Bernoulli, Bionomial, poisson.

Recommended books:

- Spiegel M.R. (1974). Theory and problems of Advanced Calculus. *Tata Mcgraw Hill Company Ltd., New Delhi.*
- Elhance D.N. (1984). Fundamentals of Statistics. *Kitab Mahal, Allahabad.*
- Edward Batschelet (1992) "Introduction to Mathematics for Life Sciences", 3rd Edition, *Springer-Verlag.*
- Brown R. (1994). Theory and Problems of differential equations. *Tata Mcgraw Hill Company Ltd., New Delhi.*
- Mendenhall W. and Sincich T. (1995). Statistics for engineering and sciences (IVth edition). *Prentice Hall.* and sciences (IVth edition). Prentice Hall.

- Gupta S.P. (2000). Statistical methods. *Sultan Chand and Company, New Delhi.*
- Kapoor V.K. and Gupta S.C. (2000) Fundamentals of Mathematical Statistics. *Sultan Chand and Company, New Delhi*
- H. Nell and D. Qualing (2002) Pure Mathematics (Advanced Level Mathematics) Vol. 1, 2, 3. *Cambridge University Press*.
- J. Crawshaw and J Chamber (2002)Advanced level Statistics, 4th Edition, *Melson Thornes.*
- Brian S., Ripley D. and Venables W. N. (2002). Modern Applied Statistics. *Springer Verlag.*

Bioinformatics (Vocational)

Paper-B

Fundamentals of Computers,

Web Technology and Networking

Time : 2 Hrs. **M.M. : 40**

Note for the paper setter/examiners:

Each question paper will consist of three sections as follows :

Section A: 8 very short answer questions are to be set. Two from each unit. The maximum length of answer can be about 1/3 of a page. All questions are compulsory. Each question will carry one mark, total weightage being 8 marks.

Section B: This section will comprise of 8 questions. Five questions to be attempted and maximum length of answer can be upto two pages. Each question will carry four marks, total weightage being 20 marks.

Section-C: This section will comprise of four essay type questions. Two questions to be attempted. Maximum length of answer can be a upto 5 page. Each question will carry 6 marks, total weightage being 12 marks.

Unit-I

Introduction to computer, History of Computers: Evolution, Generation of computers (I, II, III, IV, V), Classification of computers (Notebook, Personal Computers, Workstation, Mainframes, Minicomputers, Microcomputers, Supercomputers) – comparison with memory, power, cost, size - then and now.

Unit-II

Digital Circuits and Computer Architecture: Transistors - and Integrated Circuits (LSI, VLSI); Operation of processor; Number Systems and Digital Circuits; ALU; Memory Chips (ROM, RAM, DRAM), Storage Devices, Memory Hierarchy; I/O Devices; Bus Systems; Computer Organization and Architecture; Microprocessor; Moore's Law,

Unit-III

MS-Word: Introduction to word, Introduction to parts of window (title bar, menu bar, tool bar, ruler, status bar), Creating, opening, saving and printing a document, Editing a document, Copy move and replace the text, text formatting, Page Setup, Margins, Gutters, text alignment, Line spacing, Page break, header and footers, spell checking. Creation and Manipulation of tables, Mail Merge

MS-Powerpoint: Introduction, Power Point Elements, Exploring Power Point Menu: opening and closing menu, working with dialog box, adding text, title. Moving and resizing text, starting a slide show, opening, saving and printing a slide show.
Views: Slide view, sorter view, notes view, online view, Formatting Text, Enhancing Text by using bullets, fonts style, font size, effect and color. Displaying slide show and adding multimedia.

MS-Excel: Introduction, format of electronic worksheet, adding data in worksheet, cell addressing, saving, opening and printing a worksheet, Ranges and different type of ranges, applying formula, copying formula, various mathematical function, statistical function and date functions, charts.

Unit-IV

Network Architectures- Layered protocols- local area networks, Repeaters, bridges, Routers and structured cabling.
Computer Networks: Network communication infrastructure; Protocols; Wireless LAN and Mobile Computing.

Unit-V

Loading Linux on a PC, launching various services like web server, email server and proxy server. Setting network on Linux machine.
Web Technology: HTML and Web pages; The Internet and Intranet; WWW; Java Script and Dynamic Web Pages; Multimedia Application; Computer Network Security; e-Commerce and m--Commerce.

Recommended books:

MS Office

- Kapila H. (2003). PC Computing Window Based computer system. *Dinesh Publishers, Jalandhar.*
- Grauer B. (2005). Exploring Microsoft Office 2003 (Volume 1). *Prentice Hall, New Jersey.*

Computing Fundamentals

- Norton's P. (2001). Introduction to Computing Fundamental. *McGraw Hill Education , New Delhi.*
- Sinha P.K. (2001). Fundamental of Computers. *BPB Publication, New Delhi.*

HTML

- Deborah S. Ray, Eric J. Ray (2002) Mastering HTML and XHTML, Sybex Inc.
- HTML Complete, 3rd Edition (2003), Sybex Inc.

Bioinformatics (Vocational)
Paper-C
Basic Molecular Biology & Introduction to Bioinformatics

Time : 2 Hrs. **M.M. : 40**

Note for the paper setter/examiners:

Each question paper will consist of three sections as follows:

Section A: 8 very short answer questions are to be set. Two from each unit. The maximum length of answer can be about 1/3 of a page. All questions are compulsory. Each question will carry one mark, total weightage being 8 marks.

Section B: This section will comprise of 8 questions. Five questions to be attempted and maximum length of answer can be upto two pages. Each question will carry four marks, total weightage being 20 marks.

Section-C: This section will comprise of four essay type questions. Two questions to be attempted. Maximum length of answer can be upto 5 pages. Each question will carry 6 marks, total weightage being 12 marks.

Unit -I

Introduction to Genes and Proteins: Structure and composition of DNA/ RNA, types of DNA, organization of DNA in chromosome in Pro/ Eukaryotes, Heterochromatin/Euchromatin, Unique and repetitive sequences. *Amino acids structure and their properties, Introduction to Protein structure: Primary, Secondary.*

Unit-II

Gene expression and regulation: Overview of gene transcription, splicing of RNA, genetic code, translation, *Level of gene expression*: Transcription control, RNA processing control, mRNA transport control, mRNA translation control, mRNA and protein degradation control, Gene regulation in development and expression.

Unit -III

Basic molecular biology: restriction, digestion, PCR, clonning etc, Genetic engineering and transgenic organisms. Genome sequencing methods and analaysis. *Mapping Resources: Concepts of Mapping, Construction of physical maps, Genetic maps and radiation hybrid maps etc.*

Unit –IV

Genomics and Proteomics: Basic concept and analysis, Functional and comparative genomics: definition and applications. *Transcriptomics:* definition and applications, Pharmacogenomics and population genomics : Principle and methods.

Unit -V

Introduction to Bioinformatics: History of Bioinformatics, milestones, objectives and applications of Bioinformatics. *Genome sequencing projects, Human genome sequencing project and its applications.*

List of Books:

1. Brooker, R.J. Genetic Analysis and Principles. Addison Wisely Longman, N.Y. (2001).
2. Pevzner, J. Introduction to Bioinformatics. John Wiley and Sons, N.Y. (2003).
3. Baxevanis A.D. Bioinformatics: A practical guide to the analysis of Gene and Proteins (2nd Edition) 2001.
4. Lodish H, Berk A, Zipursky, S.L., Baltimore, D. Darnel, J. Molecular Cell Biology. W.H. Freemen and Company, USA (2000).
5. Lesk A. M. (2002). Introduction to Bioinformatics. *Oxford University Press.*
6. Krane D. E. and Raymer M. L. (2002). Fundamental Concepts of Bioinformatics. *Benjamin Cummings.*

Bioinformatics (Vocational)
Paper-D
Introduction to Database Management Systems

Time : 2 Hrs **M.M. : 40**

Note for the paper setter/examiners:
Each question paper will consist of three sections as follows:
Section A: 8 very short answer questions are to be set. Two from each unit. The maximum length of answer can be about 1/3 of a page. All questions are compulsory. Each question will carry one mark, total weightage being 8 marks.
Section B: This section will comprise of 8 questions. Five questions to be attempted and maximum length of answer can be upto two pages. Each question will carry four marks, total weightage being 20 marks.
Section-C: This section will comprise of four essay type questions. Two questions to be attempted. Maximum length of answer can be upto 5 pages. Each question will carry 6 marks, total weightage being 12 marks.

Unit I

Introduction, Characteristics of Data base approach, Database users, Intended uses of databases, Implication of database approach.
Database System Concepts and Architecture, Data Models, Schemas bad Instances, DBMS Architecture and data independence, database languages, Classification of DBMS.

Unit II

Database Design: Informal Design guidelines for relation Schemas, Functional Dependencies, Normal forms based on primary keys, General Definition of 2^{nd} and 3^{rd} Normal Forms, BCNF, Need of further Normalization.

Unit III

Data Modeling using ER diagram, ER Model Concepts, Notation for ER Diagrams. The relational Model, Relational Model Concepts, Relational Model Constraints, Introduction to Relational Algebra.

Unit IV

SQL: Introduction, Data Definition in SQL,Quries in SQL,Update statement in SQL, Views SQL, Simple programs in PL/SQL.

Unit V

Data Mining, Definition, Data Mining and KDD, Data Mining on relational databases, Data Warehouses, Transactional Databases etc. Data Mining Functionalities, Pattern Minning. Association Analysis, Classification and Prediction, Cluster Analysis, Evolution Analysis, Data Mining on Biological data.

Recommended books:

1. Fundamentals of Database Systems by Elmasari and Navathe, Prentice Hall (India), 2001
2. Data Mining Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann publisher, 2001

Bioinformatics (Vocational)

Paper-E

Lab in Database Management System & Computer Fundamentals, Web Technology

Time : 6 Hrs **M.M. : 40**

Practical:

MS-WORD

1. To create, open, close a document and toolbars operations.
2. Practical based on page setup, print a document.
3. To add headers, footer, pagebreak.
4. Table handling, Mail Merge.

MS-POWERPOINT

1. Concept of slide, presentation, custom animation.
2. To insert pictures and sound file to slide.
   Slide transition.

MS-EXCEL

1. To create, open, close worksheet.
2. To add numeric as well as character data in a cell.
3. To develop formulas, modify charts.

- Installation of LINUX
- Basic commands of LINUX.
- Basic Exercises on HTML.

- Exercises to understand RDBMS: Oracle, SQL etc.; Usage of important Commands/instructions.

Microbial & Food Technology

Paper-A

Fundamentals of Microbiology

Time : 3 Hours **M. Marks : 100**

Instructions for paper setters

There will be a total of nine questions. Question No. 1 will be compulsory and will be of short answer type (3-4 lines). However no multiple choice one-word answer type questions shall be set. The remaining 8 questions will include two questions from each unit. Candidates will be required to attempt one question from each of the four units. They will have to attempt five questions in all and all questions will carry equal marks.

Unit-I

Introduction and Scope of Microbiology : Discovery of Microorganism, history of microbiology, controversy over spontaneous origin or microorganism, discovery of anaerobic life, germ theory of fermentation, fermentation as life without oxygen, germ theory of disease.

Differences between prokaryotic and Eukaryotic cells, characteristics of main groups of microorganism (Bacteria, fungi, yeast, Virus).

Unit-II

Methods in Microbiology : Bright field microscopy and its application in Microbiology, Methods of sterilization, preparation of a culture media, pure culture concept, staining of bacteria.

Structure of Bacteria : Cell wall, cell members, capsule, pili, flagella, bacterial movement, endospore.

Unit-III

Nutrition : Nutritional requirements of Microorganisms, nutritional types of bacteria, autotrophs, heterotrophs, parasites, types of culture media, differential media, and selective media, enriched media.

Reproduction and growth in microorganisms : Modes of cell division, growth curve of bacteria, continuous culture, synchronous growth, quantitative measurement of bacterial growth, effect of various factors on growth of bacteria.

Unit-IV

Mutations and their chemical basis, DNA as genetic material, recombination in prokaryotes by transformation and conjigation transduction, bacterial plasmids.

Control of microorganisms : Control of microorganisms by physical, chemical and chemotherapeutic agents.

Books Recommended :

1. Pelczar, M.I., Chan, E.C.S. and Krieg, N.R. 1993. Microbiology. Tata McGraw Hill Publishing Col. Ltd., New Delhi.
2. Stanier, R.Y., Ingraham, J.L., Wheels, M.L. and Painter, P.R. 1986. General Microbiology, MacMillan Education Ltd. Publisher.
3. Power, C.B. and Dagniwala, H.F. 1992, General Microbiology, Volume I and II. Himalaya Publishing House, Delhi.
4. Sharma, P.D. 1997. Microbiology, Rastogi Publications, Meerut.

Microbial & Food Technology

Paper-B

Fundamentals of Food Processing and Technology

Time : 3 Hours **M. Marks : 100**

Instructions for papers setters

There will be a total of nine questions. Question No. 1 will be compulsory and will be of short answer type (3-4 lines). However no multiple choice one-word answer type questions shall be set. The remaining 8 questions will include two questions from each unit. Candidates will be required to attempt one question from each of the four units. They will have to attempt five questions in all and all questions will carry equal marks.

Unit-I

Cereal & Cereal Products : Structure and composition of wheat and rice, milling of wheat, shelling and polishing rice, Preparation of bread by straight dough, sponge dough & continuous methods.

Oil & Fats Technology : Rendering Pressing, Solvent extraction, refining & hydrogenation.

Unit-II

Milk & Milk Products Technology : Standardized milk, Toned milk, Double toned milk Clarification, Pasteurization & Homogenization of milk.

Manufacturing of procured cheese, cheddar cheese, Fermented milks (Cultured butter-milk, yogurt, Acidophilus milk, Kefir & Kumiss).

Unit-III

Fruit & Vegetable Technology : Canning, Preparation of vinegar, Jam, Jellies & Pickles. **Egg, Meat & Fish Technology**: Preservation mehods of egg, spray drying of egg. Tenderization and curing of meat, dressing of poultry, Rigor mortis of fish, preservation methods of fish.

Unit-IV

Spices & Flavour Technology : List of major & minor spices of India, Traditional & Cryo milling of spices. Preparation of oleoresins, essential oils, spice decoctions & encapsulated spices.

Food Packaging Technology : Types of containers, (Primary, Secondary & Tertiary) Form-fill-seal packaging, Aseptic packaging Food packaging materials & forms glass containers, laminates, metal cans & Retortable pouches.

Books

Lal G., Siddappa, G.S. & Tandon G.L. Preservation of fruits & vegetables. Publication & Information Division. I.C.A.R., New Delhi.

Desrosier N.W. & Desrosier J.N. The technology of food preservation, 4th edition. CBS Publishers & Distributors.

Sukumar De. Outlines of Dairy Technology. Oxford University Press.

Potter N.N. & Hotehkiss J.H. Food Science, 5th edition CBS Publishers & Distributors.

Manay N.S. & Shadaksharaswamy M. Foods Facts & Principles. New Age International Ltd., Publishers.

Kent, N.L. Technology of Cereal Processing.

Statistics

Paper A

Probability

Time : 3 Hours **Max. Marks : 100**

Note : 1. The candidates are allowed to use Non-Programmable calculators.

2. Question paper will consist of two sections. Each section will consist of five questions set from corresponding section of the syllabus.

3. The student will attempt five questions in all selecting at least two questions from each section.

4. Teaching time for Satistics would be five periods per week for each paper.

Note : The paper setters may be asked to send solutions for the questions set in the question paper.

Section-A

Random experiments, the sample space, events, algebra of events, various definitions of the probability, probability function and its properties. Finite sample spaces; equally likely outcomes additive law of probability, conditional probability, multiplicative law of probability, independent events. Baye's Theorem.

Random variable, example of random variables, discrete random variables, its probability mass function and cumulative distribution function, Continunuous random variable, its probability density function and cumulative distribution function. Properties of distribution function of discrete and continous random variables. Equivalent events, real valued functions of random variables and the procedures of finding the probability functions of such functions illustrated by examples. The expected value of a random variable and of functions of a random variable. Properties of expected values. The variance of random variable and its properties.

Section-B

Discrete Distriobutions : The uniform distribution, the Bernoulli distribution, the binomial distribution, the Poision distribution, Derivation of the Poisson distribution from the Binomial distribution, the Geometric distribution, the Pascal distribution and the Hyper geometric distribution. The expected value and variance of these distributions.

Continuous Distribution; The Normal distribution, the Exponential distribution, the Uniform distribution, the Gamma distribution, the Beta distribution. The properties of these distribution including their expected values and variance. The moment generating function, its examples and properties.

(The treatment in this paper is restricted to one-dimensional random variable only).

Book Recommended

Meyer, P.L. Introductory Probability and Statistical Applications, Addison—Wesley, (1970).

Chapters 1, 2, 3, 4 (excluding 4.6) 5,7 (excluding 7.3, (7.7, 7.8, 7.9, 7.10, 7.11). 8 (excluding 8.3 and 8.8), 9 (excluding (9.10 9.11, 9.12), 10 (excluding 10.5 and 10.6).

Books Suggested for Supplementary Reading

Biswal, P.C., Probability and Statistics, Prentice Hall, India, 2007

Ross, S.A. First Course in Probability, Sixth Edition, Pearson Education, 2007

Hogg. R.V., Mcken, J.W. and Craig. A.T., Introduction to Mathematical Statistics, Pearson Education, 2007

Miller, I, and Miller, M. Mathematical Statistics with Applications, Seventh Edition, Pearson Education, 2007

Statistics

Paper-B

Statistical Methods

Time : 3 Hours **Max Marks : 100**

Note : 1. The candidates are allowed to use Non-Programmable calculators.

2. Question paper will consist of two sections. Each section will consist of five questions set from corresponding section of the syllabus.

3. The student will attempt five questions in all selecting at least two questions from each section.

4. Teaching time for Satistics would be five periods per week for each paper.

Note : The paper setters may be asked to send solutions for the questions set in the question paper.

Section-A

Meaning and scope of statistics, limitation of statistics, Collection of data, presentation of data, diagramatic representation of data.

Attributes and variables, discrete and continuous frequency distribution of a variable, graphical representation of frequency distribution of a variable.

Central tendency : Measures of central tendency, namely, Arithmetic mean, median, mode, Geometric mean, Harmonic mean and their comparisons with an ideal measure of central tendency

Dispersion : Measures of dispersion, namely, range, mean deviation, quartile deviation and standard deviation. The advantages of standard deviation as measure of dispersion over the other measures, Relative Measures of dispersion, coefficient of variation.

Central and non-central moments, central-moments expressed in term of moments about an arbitrary origin and vice-versa. Sheppard's correction for moments.

Skewness and its measures, Kurtosis and its moasures.

Section-B

Bivariate data, scatter diagram, covariance, Karl-Pearson's correlation coefficient and its properties calculation of correction coefficent from grouped data, bounds of the correlation coefficient interpretation of the value of the correlation coefficient.

The principle of least squares, fitting of straight line, parabola, polynomials, exponential and its properties calculation of correlation coeffcient and logarithmic curve, regression lines, relation between correlation cofficient and regression coefficients. The Spearman's rank correlation coefficient.

Independence and association of attributes, measures of association and contingency.

Book Recommended

Goon, A.M. Gupta, M.K. and Dasgupta B., Fundamentals of Statistics, Vol. I, World Press, 2005.

Book Suggested for Supplementary Reading

Goon, A.M. Gupta, M.K. and Dasgupta B. Basic Statistics, World Press, 2005.

Gupta, S.C. Statistical Methods, Himalayan Publishing House, 2003.

Nagar, A.L. and Das, R.K. Basic Statistics, Oxford University Press, 2005.

Gupta, S.C. and Kapoor, V.K. : Fundamentals of Mahematical Statistics, Sultan Chand and Company, 2007.

Applied Statistics

Paper-A

Mathematical Methods-I

Time : 3 Hours **Max. Marks : 100**

Note : 1. The candidates are allowed to use Non-Programmable calculators.

2. Question paper will consist of two sections. Each section will consist of five questions set from corresponding section of the syllabus.

3. The student will attempt five questions in all selecting at least two questions from each section.

4. Teaching time for Satistics would be five periods per week for each paper.

Note : The paper setters may be asked to send solutions for the questions set in the question paper.

Section-A
(Calculus and Trigonometry)

Limits and continuity of functions, intermediate forms, derivatives and their geometrical interpretations. Successive differentiation. Applications of derivatives to maxima and minima, expontential and logarithmic functions, integrals of functions of one variable, geometrical interpretation of integral as area, integration of standard functions, integration by subsitution and parts.

Trigonometry: Definition of an angle, its various measures and relations between them, graphs, circular functions. Solution of Trigonometrical equations. Properties of triangle (Sine formula, and Tangent formula).

Section-B
(Algebra and Geometry)

The solution of linear and quadratic equations in one variable, arithmetic geometric and harmonic progressions arithmetico-geometric progression, permutations and combinations, principle of

induction, Binomial theorem for positive integral index. Coordinate Geometry : Equations of straight line, circle, parabola, ellipse and hyperbola.

Books Recommended

Allen, R.G.D. Mathematical Analysis for Economists, Macmillan India, Ltd. 2005, Chapter-II Sections 2.1, 2,2, 2.8), Chapter-III (Section 3.1, 3.6), Chapter-IV (Section 4.1-4.7), Chapter-VI (Section 6.1 to 6.8) Chapter-VII, VIII (Section 8.2), Chapter-IX (Section 9.1-9.4).

Loney, S.L. Plane Trigonometry, Part-I, Aitab Publishers and Publications, 2003 Chapter-I, (1 to 22), Part-II Chapter-V (61,65).

Grewal, B.S. Elementary Engineering Mathematics, Khanna Publishers, 2007.

Books Suggested for Supplementary Reading

Jain, P.K. and Ahmad, K.A. Text Book of Analytical Geometry of Two Dimensions, New Age International Publishers, 2004.

Narayan, S. Differential Calculus, Shyamlal Charitable Trust, 2003.

Datta, U., Mohagaonkar, S.D. and Muktibodh, A.S. Algebra and Trigonometry, Prentice, Hall, 2007.

Applied Statistics

Paper-B

Probability

Time : 3 Hours **Max. Marks : 100**

Note : 1. The candidates are allowed to use Non-Programmable calculators.

2. Question paper will consist of two sections. Each section will consist of five questions set from corresponding section of the syllabus.

3. The student will attempt five questions in all selecting at least two questions from each section.

4. Teaching time for Satistics would be five periods per week for each paper.

Note : The paper setters may be asked to send solutions for the questions set in the question paper.

Section-A

Statistical data and frequency distribution, Random experiments, sample space, various types of events, probability, Finite sample spaces, equally likely outcomes, additive law of probability, conditional probability, Multiplicative law of probaility, Baye's theorem, independent events (pair wise and mutual), random variables: discrete and continous, probability mass function, probability density functions, Cumulative distribution function and its properties.

Section-B

Expectation and variance of a random variable. Discrete distribution: Uniform, Bernoulli Binomial, Poisson, Negative Binomial, Geometric, Hyper geometric distribution. Continuous Distributions: Uniform, Exponential, Gamma, Beta and Normal distribution.

Book Recommended :

Meyer, P.L., Introductory Probability and Statistical Applications, Addison Wesley, 1970. Chapter, 1,2,3,4,5,8 and 9.

Books Suggested for Supplementary Reading

Biswal, P.C. Probability and Statistics, Prentice Hall of India, 2007.

Ross, S. A First Course in Probability, Pearson Education, 2007.

Mathematics

Paper-I

Algebra

Time : 3 Hours **Max. Marks : 65**

Note : 1. Syllabus of this paper is split into two Parts Section-B. Five questions will be set from each Section.

2. The student will attempt five questions in all selecting at least two questions from each section.

3. Teaching time for Mathematics would be five periods per week for each paper.

Section-A

Partitioning of a matrix. Linear independence of row and column vectors. Row rank, Column rank of a matrix, Equivalence of column and row ranks, Nullity of matrix, Applications of matrices to a system of linear (both homogeneous and non-homogeneous) equations. Theorems on consistency of a system of linear equations. Eigen values, Eigen vectors, minimal and the characteristic equation of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix. Quadratic Forms, quadratic form as a product of matrices. The set of quadratic forms over a field. Congruence of quadratic forms and matrices. Congruent transformations of matrices. Elementary congruent transformations. Congruent reduction of a symmetric matrix.

Matrix Congruence of skew-symmetric matrices. Reduction in the real field. Classification of real quadratic forms in variables. Definite, semi-definite and indefinite real quadratic forms. Characteristic properties of definite, semi-definite and indefinite forms.

Section-B

Relations between the roots and coefficients of general polynomial equation in one variable. Transformation of equations and symmetric function of roots, Descarte's rule of signs, Newton's Method of divisors, Solution of cubic equations by Cardon method, solution of biquadratic equations by Descarte's and Ferrari's Methods.

De-Moivre's Theorem and its applications, circular and hyperbolic functions and their inverse. Exponential and Logarithm function of a complex numbers. Expansion of trigonometric functions. Gregory's series. Summation of series.

Books Recommended

1. K.B. Dutta: Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi (2002).
2. H.S. Hall and S.R. Knight: Higher Algebra, H.M. Publications, 1994.
3. Chandrika Parsad : Text book on Algebra and Theory of Equations, Pothishala Pvt. Ltd., Allahabad.
4. S.L. Loney : Plane Trigonometry Part-II, Macmillan and Company, London.
5. R.S. Verma and K.S. Shukla : Text Book on Trigonometry, Pothishala Pvt.Ltd., Allahabad.
6. Shanti Narayan : Text Book of Matrix.

Mathematics

Paper-II

Calculus-I

Time : 3 Hours **Max. Marks : 65**

Note : 1. Syllabus of this paper is split into two Parts Section-A and Section-B. Five questions will be set from each Section.

2. The student will attempt five questions in all selecting at least two questions from each section.

3. Teaching time for Mathematics would be five periods per week for each paper.

Section-A

Real number system, its properties, lub, glb of sets of real numbers $\varepsilon-\delta$ definition of the limit of a function, Basic properties of limits. Continuous functions and classification of discontinuities. Uniform continuities, differentiation of hyperbolic functions, Successive differentiation. Leibnitz theorem. Taylor's and Maclaurin's theorem with various forms of remainders. Indeterminate forms. Asymptotes. Tests for concavity and convexity, Points of inflexion, Multiple Points, Curvature, Tracing of Curves (Cartesian and Parametric coordinates only).

Section-B

Integration of hyperbolic functions. Reduction formule. Definite integrals. Fundamental theorem of integral calculus. Inequalities involving integrals. Quadrature, rectification volumes and surfaces of solids of revolution.

Books Recommended :

1. N. Piskunov : Differential and Integral Calculus, Peace Publishers, Moscow.
2. Gorakh Prasad : Differential Calculus, Pothishala Pvt. Ltd., Allahabad.
3. Gorakh Prasad: Integral Calculus, Pothishala Pvt. Ltd., Allahabad.
4. Erwin Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 1999.

Mathematics

Paper-III

Differential Equations and Co-ordinate Geometry

Time : 3 Hours **Max. Marks : 70**

Note : 1. Syllabus of this paper is split into two Parts—Section-A and Section-B. Five questions will be set from each Section.

2. The student will attempt five questions in all selecting at least two questions from each section.

3. Teaching time for Mathematics would be five periods per week for each paper.

Section-A

Exact differential equations. First order and higher degree equations solvable for *x,y,p.* Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Orthogonal trajectories. Linear differential equations with constant and variable coefficients. Variation of Parameters method, reduction method, series solutions of differential equations. Power series method, Bessel and Legendre equations. (only series solution).

Section-B

Transformation of axes, shifting of origin. Rotation of axes, Reduction of the second degree equation into standard forms by transformation of co-ordinates. The invariants. Indentification of curves represented by second degree equation (including pair of lines.) Pole and polar, pair of tangents at a point, Chord of contact, equation of the chord in terms of mid point and diameter of conic.

Parabola, ellipse and hyperbola and their properties. Polar equations of conics. Equations of chords, tangents and normal only.

Books Recommended

1. D.A. Murray: Introductory Course in Differential Equations. Orient Longman (India), 1967.
2. G.F. Simmons: Differential Equations, Tata McGraw Hill, 1972.
3. E.A. Codington: An Introduction to Ordinary Differential Equations, Prentice Hall of India, 1961.
4. Gorakh Parsad and H.C. Gupta, Text Book on Coordinate Geometry.
5. Gorakh Prasad: Differential Calculus, Pothishala Pvt. Ltd., Allahabad.
6. S.L. Loney, The Elements of Coordinate Geometry, Macmillan and Company, London.

Early Childhood Care and Education

(Vocational)

Paper-A Theory	3 Hours	M.100
Paper-B Practical	3 Hours	M. 100
Assignment :		M. 10
Demonstration		M. 10
Preparation of two Toys		M. 20
Practical Notebooks		M. 15
Written Practical test		M. 15
Oral examination		M. 10
Internal Assessment		M. 20

Teaching Work load

Theory	6 Period per week
Practical	4 Period per week

Early Childhood Care and Education

(Vocational)

Paper-A (Theory)

Time : 3 Hours **Max. Marks : 100**

Note : Instructions for the paper-setters/examiners.

Each question paper may consist of three sections as follows:

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answers to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Definition and importance of child development, stages of Development, principles of development, Factors affecting Physical Development.

Growth and development during prenatal periods, Factors effecting prenatal development.

Care of Mother: Pregnancy, Discomforts, Physical and Psychological care, Preparation for Delivery.

Care of Child: feeding, clothing, bathing habit, formation, rest and exercise, common diseases, immunization.

Physical and motor development.

Social development and role of family and School in Socialization. Language development.

Emotional Development.

Recreation for young children.

Early Childhood Care and Education

Paper-B

(Practical)

Time : 3 Hours **Max. Marks : 100**

1. Visit to well baby clinical/meternity wards to observe new born baby's features and characteristics.
2. Demonstration on baby's feed and bed making.
3. Demonstration on baby's bathing and Dressing.
4. Sterlisation of feeding bottles.
5. Preparation of two toys.
6. Immunization of infants.

Books Recommended :

1. Child Care by Claire Rayner.
2. A Text Book on Child Development by Rajammal P. Devadar, N Jaya.
3. Pregnancy The Beginning of Motherhood by Gurmeet M.P. Singh and Dr. (Mrs.) P.L. Srivastava.

Fashion Designing and Garment Construction (Vocational)

Scheme of Studies

Paper-I	**Name**	**Time Allowed**	**Marks**
(Theory)	Fashion Designing	3 Hrs.	M.M. : 50
Paper-II	Dress Designing &	4 Hrs.	Pract. : 60+Int.Ass. 15=75
(Practical)	Garment Construction		
Paper-III	Scale Drawing	3 Hrs.	Pract. : 40+Int.Ass. 10=50
(Practial)			
***Paper-IV**			
(Field Trip)			
(Workshop)	-	-	**25**

*The students shall be required to take field trips during term break to fashion houses/export houses/ boutiques after B.A. Ist year exams. They will be required to present a report carrying 15 marks. A workshop will be conducted regarding tie bye, Batik, Block, screen printing which will carry 10 marks. They will have to prepare one article each. (15+10=25)

Paper	**Name**	**Lectures/ Week**	**Total Teaching load**	**Exam. (Th.)**	**Hours (Prac.)**
I.	Fashion Designing	(Th.)	(Prac.)		
		4	-	3 Hrs.	
II.	Dress Designing and				
	Garment Construction		2x3=6	-	4 Hrs.
III.	Scale Drawing		2x2=4	-	3 Hrs.

Fashion Designing and Garment Construction (Vocational)

Paper-I
Fashion Designing (Theory)

Time : 3 Hrs. **M.M. : 50**

1. **Fashion Designing :** Fashion Design and Garment Constructions.
   a) **Introduction**
   Fashion, fad, style, classic, trends, Mass Fashion, High Fashion.
   b) **Origin of Clothing**
   Concept and theories of clothing origin.
   c) **Theories of Fashion Adoption**
   Trickle down theory, trickle across theory and bottom up theory.
   d) **Fashion cycle and factors affecting it**
   Accelerating factors and regarding factors.
2. Elements of design and principles related to clothing.
3. General factors affecting clothing choices for different age groups.
4. **Fashion forecasting :** Its factors affecting fashion forecast.
5. **Wardrobe planning :** Life style analysis, existing wardrobe analysis, resource evaluation, purchase plan.
6. (i) **Fashion designers of India :**
   a) Ritu Beri
   b) Rohit Bal
   (ii) **Fashion designers of West :**
   a) Calvin Klein
   b) Coco Channel

General Instructions for the paper setters for Theory Paper-I

The question paper will consist of eight questions in all, out of which students will attempt five. All the questions carry equal marks.

Paper-II (Practical)

Dress Designing and Garment Construction

Time : 4 Hrs. **M.M. : 75**
Practical Paper=60
Int. Ass.=15

1. **Make samples of the following :**
   a) Tacking, running, learning back stitch, button hole, fastners.
   b) Seams : Plain seam, counter seam, run & fell seam, French seam.
   c) Process : Continuous wrap, two piece placket, plain dart, fish dart, gathers, Pin-tucks.
2. **Make a sample of 10 embroidery stitches :**
   Stem stitch, chain, cross, satin, herringbone, laisy-daisy, Bullion, French Knots, fly stitch, feather stitch.
3. **Draft and construct the following :**
   a) Childs bodice block and plain sleeve block
   b) Sleeves : i) Puff ii) Cap iii) Petal
   c) Collars : i) Peter pan (plat/raised) ii) Sailor's collar
4. **Design, Draft and construct the following :**
   a) Romper/Sun Suit
   b) Design frock (3-6 yrs.)
   c) Sports wear (5-8 yrs.)

Instructions to the paper setter for Practical-II

Paper : 60
Int. Ass. : 15

1.	Design any one garment from syllabus paper bag-front+back	5 marks
2.	Adaptation to be made from sloper	10 marks
3.	Cutting+Placement	10 marks
4.	Construction and finishing of garment	25 marks
5.	File and scheme work	10 marks

Note : Please send the material list alongwith

Paper-III (Practical)
Scale Drawing

Time : 3 Hrs. **M.M. : 50**
Paper : 40
Int. Ass. : 10

A. 1. Basic block figure
2. Distribution of weight
3. Flesh figure
4. Formulae of hand and feet
5. Formulae of face
6. Leg formulae
7. Necklines and collars
8. Sleeves and cuffs
9. Skirts-Pleats, gathers, frills, fringes
10. Tops
11. Accessories : Headgear, bags, footwear and jewellery.

B. Using any of the following details drope the fashion figures, prepairing 8 sheets in all using textured backgrounds.
1. Bias/Drapes
2. Yokes+waistlines
3. Bows+pockets
4. Drawstrings+fastners+zips
5. Trimmings (Tucks, piping, embroidery, tassels, rouleav, smocking, shirring, applique, patch work)

C.**Colour wheel**
1. Colour schemes—Monochromatic, Analogous, complementary.
2. Value chart, intensity chart
3. Basic Design Motifs-Geometrical, Traditional, Abstract

Instructions to the paper setter for Practical-III **40 marks**
Q.1. will be from Part 'A' of the syllabus carrying **10 marks**
Q.2. will be from Part 'B' of the syllabus carrying **15 marks**
It will be a coloured sheet.
Q.3. will be from Part 'C' of the syllabus carrying **10 marks**
Q.4. File **5 marks**

Still Photography and Audio Production
(Vocational)

a) **Time Allowed** — Theory : 3 Hours; Practical : 5 Hours

b) **Maximum Marks** — Theory : 100 Marks; Practical : 100 Marks (Including Assessment)

Credit Hours for Teaching the Subject per week — **Theory: 3 Hrs.** **Practical: 20 Marks**

Paper-I (Theory)

Time : 3 Hours **Max. Marks : 100**

Paper-A
Introduction to Communication

Paper-B
Media Scene in India and Basic Photography

Instructions :

a) 10 objective type questions of 2 marks each. 20 Marks

b) Do any 10 out of 12 questions of 5 marks each. 50 Marks

c) Do any 2 out of 4 questions of 15 marks each. 30 Marks

d) Two questions for each Paper, Part-I compulsory in Paper-I (Theory).

Basic Photography

Theory

Time : 3 Hours **Max. Marks : 40**

Paper-II Practical

Viva	20 Marks
Practical	60 Marks* (50+10) = 60
Internal Assessment	20 marks

*10 Marks of Sessional Work done during the session (Internal) to be sent by Internal examiner separately.

Still Photography & Audio Production (Vocational)

Paper-I

Introduction to Communication

Part-A **25 Periods**

Time : 3 Hrs. **Max. Marks : 60**

a) Concepts

Introduction to Communication-concept, process and functions
Intrapersonal, Inter-personal, Group and mass Communication
feed back evaluation of communication barriers of communication.

b) Verbal Communication
Concept and practice
Language and Mass Communication
Lanaguage uses in different mass media
Language and Society.

c) Non verbal Communication
Para language, dress and body language
Non-verbal Communication and Mass Communication.

d) Traditional forms of Communication
Converting all the above areas in this paper
News reporting and editing,
News paper layout, news analysis,
Desk top publishing techniques and word processor

Part-B

Media Scene in India & Basic Photography 25 Periods

a) Evaluation of press and its role in different socio-economic and political systems.

b) Press laws in India, Press Registration Act, Copyright and defamation, contempt of court.

c) Introduction to Radio as a medium of mass communication and its characteristics-radio development in India.

d) Introduction of T.V. as a medium of mass communication and its characteristics, development of T.V. in India.

Still Photography & Audio Production

Paper -I

Basic Photography (Theory)

Topics **Max. Marks : 40**

25 Periods

A. Basic Principles

1. Properties of Light Electromagnetic spectrum, Theories of Light transmission, spectrum, Dispersion, Reflection, Transmission, Refraction, Polarisation.
2. Controlling Light Pin-hole Camera, Simple, Convex, Concave, mirror lenses, Lens abberation, Lens equation, Correction of abberations, ray diagram.
3. Comparison of eye with the Camera.
4. Processing of file Light sensitive chemical, latent image, development, fixing.

Still Photography & Audio Production

Paper-II

Basic Photography

Practical Viva **20 Marks**

Camera (Viva) **15 Periods**

1. Mechanism.
   Shutter, aperture, focus, camera body, film transport, vio finder.
2. Comparison/classification of Camera their focussing machanism, view finder, range finder, T.C.R.S.C.R. film format : Large, medium miniature disc. etc.
3. Operation
   Exposure, tables of lighting.

Practical

Time : **60 Marks**

Experiments **60 Periods**

1. Handling of Camera.
2. Loading and Shooting B/W Films
3. Effect of aperture.
4. Effect of shutter speed.
5. Making of grey scale.
6. Photograph.
7. Processing B/W film.
8. Contact print.
9. Enlargements/B/W
10. Photo feature.
11. Maintenance of Camera.

Paper-I (Introduction to Communication)	**100 Marks**
(Basic Photography)	**80 Marks**
Paper-II (Practical) Viva & Practical	**80 Marks**
Internal Assessment	**20 Marks**
	Total 200

Gemology and Jewellery Design

(Vocational)

Jewellery & Gemology

Instructions for Paper Setters :

1. The Question Paper will cover all the topics of the syllabus.
2. The Paper setter should set the paper in three sections i.e. Section A, B and C.

Section-A : 12 questions will be set by the examiners. Out of 12 questions the candidate will attempt 10 questions of 1 mark each. (10 marks)

Section-B : 12 questions will be set by examiner. Out of 12 questions the candidate will attempt 8 questions of 4 marks each. (32 marks)

Section C : 4 questions will be given to candidates to attempt 2 out of the 4. Each question will carry 9 marks. (18 marks)

Subject

1. **Theory**
2. Practical Paper-I
   Design
3. Practical Paper-II
   Workshop

Paper-I
Theory

Time : 3 Hrs. **Max. Marks : 60**

1.	Brief history of Jewellery	Indus Valley, Shunga period, Gupta Period, Mughal period.
2.	Introduction to Jewellery Design	Fine Jewellery Costume Jewellery
3.	Introduction to Metals	Precious-Gold, Silver, Platinum Semi-Precious-Iron, Copper

Chemical Detail

		1. Occurrence
		2. Availability
		3. Chemical & Physical properties
		4. Tendency to form Alloys
4.	Properties of Metals	Dustre, ductility, Malleability,
	Physical	Conductors or non-conductors.
	Chemical-	Reaction with air, Acids, Reactivity
5.	Introductory definitions Jewellery making Acid-Etching	Mark Making, Piercing, of Basic Filling, Soldering, Form Making Engraving,
6.	Introduction to Gemstones	Ruby, Emerable, Pearl, Diamond, Sapphire, Zircon, Lapislazuli
7.	Organic & Inorganic Gemstones	
8.	Formation of Gemstones	Igneous Rocks
		Sedimentary Rocks
		Metamorphic Rocks

Gemology and Jewellery Design

Practicals

Practical -140 Marks

External - 100 Marks

Int. Asstt.- 40 Marks

Practical-P1

Paper-II

Design

Hrs - 5 **Marks : 50**

1. Exercises on

i) Pencil Control

ii) Drawing & Shading -2 Dimensional
-3 Dimensional

2. Development of Plain and Simple Design
3. Collecting and Recognizing forms for designing
4. Drawing - Color(Medium-Pastels)
5. Mark - Making+Texturing : Collection of different textures from different objects.

Practical-P2

Paper-III **Workshop** **Hrs : 5**

Marks : 50

1. Exercises on

i) Form drawing on collected & recognized materials

ii) Different techniques and methods of creating Jewellery

iii) Constume Jewellery

Innovative Jewellery

iv) Design Development

Office Management and Secretarial Practice
(Vocational)

Year	Paper		Scheme		Marks
			Theory	Practical	Internal
Ist year	I.	**Typewriting**	40	40	20
	II.	**Shorthand (English only)**	40	40	20
		On the Job Training of 4 weeks			

1. The following pattern of setting of question paper shall be observed :
   a) For Papers-I,II,IV & VI : The question paper will be divided into two parts. In Part-I, 12 short questions will be set and candidates will be expected to attempt 10 questions. Each question will carry 2 marks. In Part-II 8 questions will be set and the candidate will be expected to attempt 4 questions. Each question will carry 5 marks.
   b) For Papers : III & V : The question paper will be divided into two parts. In Part-I, 12 very short answer type questions will be set and the candidates will be expected to attempt 10 questions. Each question will carry 2 marks. In Part-II, 8 essay type questions will be set and candidates will be expected to attempt 4 questions. Each question will carry 10 marks.
2. Internal Assessment in respect of theory papers shall be based on tests, assignments and quizzes. In case of practical papers it will be based on maintenance of records, actual conduct of practical performance etc.
3. A consolidated report "On the Job Training" after Ist year and II year shall be prepared by every student and must be submitted in the college concerned upto September 30. The consolidated report will be evaluated by the external examiner and shall be given the grades as follows :

O=Outstanding, A=Very Good, B=Good,

C=Average, D=Unsatisfactory

In case, the Training Report is rated as unsatisfactory, the candidate shall have to submit it again incorporating the changes suggested by the examiner within one month from the date of intimation to the candidate by the concerned college.

Office Management and Secretarial Practice (Vocational)

Paper-A

Typewriting

Time : 3 Hours **Max. Marks (Theory): 40**

Practical : 40

Int. Ass. : 20

Part-I

Typewriter and its maintenance :

Typewriter - Its use and importance a standard typewriter.

* Makes and categories of typewriter.
* Essential parts of a typewriter and their use.
* Care and upkeep of a typewriter.
* Ribbon changing and ribbon economy.
* Methods of typewriting.
* Touch
* Sight

Approach of typing :

* Horizontal
* Vertical
* Keyboard operation
* Need for proper type and size of tables and chairs for use by typist
* Sitting postures
* Material required
* Insertion and removal of paper
* Learning and second row (Home row) (guide keys and home keys).
* Learning the third row (upper-row)
* Learning the first row (bottom row)
* Learning the fourth row (number row)
* Special signs and symbols in the keyboard and their uses.

Part-II

Display in typewriting :

* Centering - horizontal, vertical.
* Types of headings.
* Use of punctuation marks
* Figures - Arabic and Roman
* Paragraphs - type and styles, numbering, pagination. Styles of typing different kinds of letters.
* Arrangement of tabular statements.
* Syllabification.
* Foot notes.

Practicals

Max. Marks : 40

Key Board Operations

1. Practising second row, third row, first row and fourth row.
2. Practising words, sentences, paragraphs and passages.
3. Use of shift keys and other non-character keys.
4. Typewriting of special symbols of the Key Board and punctuation marks.

Speed Building

1. Different kinds of drills for typing.
2. Graded speed test leading to accurate speed of about 30 w.p.m.
3. Typing of passages each containing 300 words in ten minutes.

Teaching Guidelines

Alternative and hand words, balanced handwords, same letters in different words, drills of common words, drills of alphabetical sentences and words division drills.

Display Techniques

1. Centering - Horizontal and Vertical.
2. Ensuring proper margins, line spacing.
3. Typing different types of heading including spaced heading.

Letter Typing

1. Typing exercises of personal, official and business letters in different styles with proper display.
2. Typing of applications for jobs.
3. Addressing the envelopes.
4. Using carbon papers for taking out multiple copies.

Office Management and Secretarial Practice
Paper-B
Shorthand (English only)

Time: 3 Hours **Max. Marks (Theory) : 40**
Practical : 40
Int. Ass. : 20

Part-I

Introduction

Origin of shorthand, with particular emphasis on Pitman shorthand, definition and importance of stenography; qualities of a successful stenographers, writing techniques and materials.

Consonants:

Definition, number, forms, classes, size thiness, thickness, directions and joining strokes.

Vowels, Dipthongs and Diphones:

Vowels—definition, number, sounds, signs, places position of outlines, intervening vowels.

Introduction of upwards downwards strokes in stenography.

Dipthongs—definition, names, signs, placed, joined dipthongs and triphones.

Diphones—definition, signs and application.

Use of vowels dipthongs and diphones in plural in stenography.

Grammalogues and Phonography:

Grammalogues—definition of grammalogues and lopogram, list of grammalogues, punctuation signs, definition of phrase, how a phrase is written, qualities of good phraseogram, list of simple phrases.

Part-II

Circles, loops and hooks:

Circle and loops—size and direction, application in Phraseography, attachement with straight and curved strokes, exception to the use of circle, loops; size and direction.

Initial of final Hooks–Size & Direction. Application in Phraseology. Attached with straight & curve strokes and their uses with the circles & loops.

Shorthand (Practicals)

1. Repeated practice of consonants, writing each consonant from the text materials with particular attention to their formation, length, angle, size and direction.
2. Repeated practice of vowels, dipthongs, diphones and triphones by copying the text materials and other printed shorthand book and reading the same book.
3. Repeated practice of grammalogues and phrases.
4. Repeated practice on the use of circle, loops and books.
5. Transportation from shorthand into long hand.
6. Dictation from unseen passage.
7. Variety of drills: Reading shorthand from black – board, copying shorthand from black board, cold note reading, delayed writing, students dictate to the class room from shorthand books, two minutes speeches by students, reading printed shorthand matter.

Probable work sites where on the job training may be organized

i) Government Department Offices.
ii) Business/Commercial Organisation.
iii) Industrial Establishments.
iv) Hospitals.
v) Educational Institutions.
vi) Railways, Airlines and other Transport undertakings.
vii) Banking and Insurance Organisation.
viii) Parliament and State Assemblies.
ix) Job work Canters.

This is a tentative list. Principal may be given the complete freedom to select any organisation. However, while selecting the

institution, care should be taken to select such institution who show willingness to accept the trainees and have the scope for providing variety of experiences in Office Practice and Stenography area.

Suggested Departments/Section for 'On-the-Job Training' at the end of first year.

Department/Section	**No. of Weeks**
1. Reception /Inward and Outward mail	1
2. Office establishment/filling/office equipment and production	1
3. Stenography work and typing with various executives and section	1
4. Sales, Advertising and Publicity, Stores and Accounts	1
	4 Weeks

Suggested Department/Section for the 'On the Job Training' at the end of Second Year.

Department/Section	**No. of Weeks**
1. Private Secretaries of various executives in different Department of the Organisation	1
2. Office establishment/Company Secretary Share Department	1
3. Accounts Department/Time Office/Reception	1
4. Typing Pool/Advertising/Publicity	1
	4 Weeks

Note: The purpose of the On-the-Job Training is to expose the student to the world of work and provide professional experience in real situation. The student shall have to maintain a diary and submit a detailed report of his activities which shall be certified by a responsible officer of the establishment. However, the teacher will also supervise the 'On-the-Job Training' programme.

Suggested Reading Materials

a) Shorthand :

	Title	Publisher
1.	Pitman Shorthand Dictionary	A.H. Wheeler & Company
2.	Pitman Shorthand Reading and Dictation Exercises	Pitman Shorthand Schools, New Delhi
3.	Shorthand made easy for beginners with key	O.P. Kuthiall
4.	How to start shorthand Speed building	-do- & Edger Thrope
5.	How to avoid confusion in outline in pitman shorthand	-do-
6.	A Compelesive List of grammar Languages - & Contractions	O.P. Kuthiall
7.	H.A. Mehta Typewriting complete course	Mehta Publishing Corporation, Basant Mahal. Wadala (East) Bombay–4000037
8.	H.A. Mehta Typewriting Office Practice set	Mehta Publishing Corporation, Basant Mahal. Wadala (East) Bombay–4000037
9.	H.A. Mehta Business Letter typing sets	Mehta Publishing Corporation, Basant Mahal. Wadala (East) Bombay–4000037
10.	Typewriting by Md. Khan Dictation Exercises	Chittoor Publishing House, Chittoor, A.P.
11.	Layouts and Forms in Typewriting	State Board of Technical Education, Hyderabad – 500022

12.	20th Century Typewriting	South-Western Publishing Company, Gincinati, Ohio, USA.
13.	Typewriting Drills for speed and accuracy	Gregg. Publishing Corporation, USA.
14.	Principles of Typewriting	D.P. Bhatia, S.S. Sangal
15.	Typewriting speed & accuracy	O.P. Kuthiall & Thorpe
16.	Typewriting Theory Practicals	R.C. Bhatia
17.	Type writing speed & Accuracy-B-I	O.P. Kuthiall
18.	Type writing speed & Accuracy-B-II	-do-

a) Office Practice :

1.	Office Practice Made Simple	By G. Whitehead, 1974 W.H. Allen Publishers
2.	Office Management and Commercial Correspondence	By Balraj Duggal, 1998 Published by Kitab Mahal
3.	Office Management and Secretarial Practice by V.P. Singh	Gyan Publishing House, Delhi
4.	Business Correspondence and Office Practice by Nagamia and Bhai	Thakkar Publication, Bombay
5.	Business Communication by Doctor & Doctor	Seth Publication, Bombay – 4
6.	Commercial Correspondence	By Majumdar
7.	Modern Commercial Correspondence	By R.S. Sharma
8.	Modern Commercial Correspondence	By Chandgadkar & Tele
9.	Secretarial Practice by H.A. Mehta and others	Vikas Publications Pune.

Travel & Tourism (Elective)

Paper-A

Fundamentals of Travel and Tourism

Time: 3 Hours **Max.Marks : 100**

Instructions for the Paper Setter

The Theory Paper consists of two Parts A and B (short questions and long questions).

Part-A : The examiner will set 12 short questions, 3 questions from each section of 02 marks each. The candidate will have to attempt 10 questions out of 12 questions.

(10x2=20 Marks)

Part-B : The examiner will set 8 long qustions, 2 questions from each section of 20 marks each. The candidate will have to attempt 4 questions out of 8 question.

(4x20=80 Marks)

Unit-I

Chapter 1. Conceptual Framework of Tourism

Travelers, excursionist, tourists/visitors.

Tourism and tourist - domestic and internaitonal.

The dynamics of definitions.

Chapter 2. Tourism Product and its Characteristics

Tourism through the ages.

Tourism as a product

Characteristics of tourism

Unit-II

Chapter 3. The Construct of Tourism

Notion of Tavel in historical imagination

Types and forms of tourism

Motivations for tourism.

Chapter 4. Objects of Tourism

Tourism as an object of pleasure—Scenic beauty, health and leisure.

Tourism as a preserver of heritage—Historical and religious sites.

Tourism as an object of culture—Holiday seasons, Tourism as a social habit.

Tourism as a means of globalization—Theme of integration and identity.

Unit-III

Chapter 5. Issues and Problems (1)

Infrastructure and super-structure.

Levels of Study.

Global; International concerns, problems and organizations—WTO, IATA and ICAO

Chapter 6. Issues and Problems (2)

Macro: National concerns and problems and oganizations—Ministry of Tourism and ITDC.

Meso: Local concerns and problems.

Micro : Enterprise level concerns and problems.

Unit-IV

Chapter 7. Positive Effects of Tourism

Integrational

Nation building - appreciation of language, dress, food and Customs.

Information flows - travelogues.

Removal of barriers - flow of goods.

Chapter 8. Negative Effects of Tourism

Conflicts - cultural shock.

Ecological degradation.

Dangers to protected archaeological sites

Interference in wildlife habitat

Social effects on the residents of tourist places

Suggested Readings :

- Burkart, A.J. & Medlik, S. : *Tourism: Past, Present and Future,* Heinemann Professional Publishing, London, 1986 reprint.
- Mill, Robert and Christie & Morrison Alastair M. : *The Tourism Systems: An Introductory Text,* Prentice-Hall International, London, 1992.
- Holloway, Christopher - J.: *The Business of Tourism,* Pitman Publishing, London, 1989.
- Kamra, Krishan, K & Chand, Mohinder: *Basics of Tourism: Theory Operation and Practice,* Kanishka Publishers, New Delhi, 2002.
- Bhatia, A.K. : *Tourism Development: Principles and Practices,* Sterling, New Delhi, 1995.
- Foster, Douglas, *Travel and Tourism Management,* Macmillan, 1985.
- *IITTM Growth of Modern Tourism - Monograph,* IITTM, New Delhi, 1989.
- *IITTM Tourism as an Industry,* IITTM, New Delhi, 1989.
- Wahab, S.E., *Tourism Management,* Tourism International Press, London, 1986.
- Gupta I.C., *Tourism Products of India,* Indore, 1995. Kasbekar Sushma.
- Singh, Ratandeep *Tourist India: Hospitalities Services,* Kanishka, New Delhi, 1996.

Travel & Tourism (Elective)

Paper-B

Indian Heritage and Tourist Resources

Time : 3 hrs. **Max.Marks : 100**

Instructions for the Paper Setter

The Theory Paper consists of two Parts A and B (short questions and long questions).

Part-A : The examiner will set 12 short questions, 3 questions from each section of 02 marks each, The candidate will have to attempt 10 questions out of 12 questions.

10x2=20 Marks

Part-B : The examiner will set **8 long questions,** 2 questions from each section of 20 marks each. The candidats will have to attempt 4 questions out of 8 questions.

4x20=80 Marks

Unit-I

Chapter 1. Geography and tourism

Physical features of Indian subcontinent.

Climatic conditions of India.

Chapter 2. Natural Resources and Tourism

Wildlife Sanctuaries: Jim Corbett Tiger Reserve, Bharatpur Bird Sanctuary

National Parks and Natural Reserves of India : Valley of Flowers, Kanha, Kaziranga, Ranthambhore.

Unit-II

Chapter 3. Architectural heritage.

Overviews of Ancient, medieval and modern forms of architecture.

Chapter 4. Important Monuments.

Stupa at Sanchi, Brihadeshwara Temple (Tanjore), Red Fort (Delhi), Taj Mahal (Agra), Lutyen's Delhi, Lotus Temple (Delhi).

Unit-III

Chapter 5. Performing Arts

Schools of painting.

Classical dances and dance styles

Folk dances.

Schools of music.

Musical instruments.

Chapter 6. Handicrafts and Handlooms

Types of Handicrafts and Handlooms in India.

Major Fairs for Promotion of Handicrafs and Handlooms-Dilli Haar, Central Cottage Industries Emporium, Fab India.

Unit-IV

Chapter 7. Fairs and festivals

Traditional : Kumbha, Pushkar, Chhatha, Pongal, Holi, Onam, Durga Puja, Ramalila, Diwali, Dashahara (Kullu), Rathyatra, Id-ul-Fitr. Muharram, Christmas.

Modern: Carnival (Goa), Ganga Mahotsava, Taj Mahotsava, Khajuraho Mahotsava and Desert Festival.

Chapter 8. Hill Stations and Coastal Tourism

Major Hill Stations: Shimla, Darjelling, Ooty, Gangtok, Gulmarg, Ladhak, Kodikannal

Coasts and Beaches: Beaches of Andaman & Nicobar Islands, Marina Beach (Chennai), Konark Beach (Orissa), Juhu Beach (Mumbai).

Suggested Readings :

- Harle, J.C. The *Art and Architecture of the Indian Subcontinent,* Penguin Books, 1990.
- Brown, Perey Indian Architecture (Buddhist and Hindu) and *(Islamic Period),* Bombay, 1942 and Calcutta, 1942 respectively.
- Basham, A.L. *The Wonder that was India,* Rupa and Co., Delhi, 1988.
- Westlake, Graeme, D. *An Introduction to the Hill Stations of India,* Harper Colins Publishers, India, 1993.
- Mishra, Lavkush *Cultural Tourism in India,* Mohit Publications, New Delhi, 1999.
- Day, C.R. *The Music and Musical Instruments of Southern India and the Deccan,* Delhi, Reprint, 1990.
- Rele, Kanak, *Indian Classical Dances and the Seven Classical Dance Styles,* A Video Film; Handbook of Indian Classical Dance Terminology, Bombay, 1992.

Tourism and Hotel Management (Vocational)
Paper-A

Time : 3 Hours **Max. Marks : 100**

Theory : 80

Int. Ass. : 20

Instructions for the paper setters :

Section-A will consist of 8 very short answer questions with answers to each questions up to five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage being 16 marks.

Section-B will consist of short answer questions with answer to each question upto *two pages* in length. Twelve questions will be set by the examiner and eight will be attempted by the candidate. Each question will carry four marks. The total weightage of the section shall being 32 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry 16 marks: total weightage of the section being 32 marks.

Introduction : This paper is for the basic understanding of Tourism and Hospitality Industry and Hotel Management. Relationship between Tourism, Airlines and hospitality Industry and for the basic understanding of Hotel Management.

(I) Evolution of Hospitality Industry in India and Abroad.

a) Accommodation and its types

b) Star categorization of Hotels

(II) Four subject of Hotel Management

a) Front Office:

(i) Layout of front office and their importance i.e. reservation, reception, concierge, bell desk, lobby, telephone, cashier.

(ii) Qualities of front office staff.

(iii) Department front office coordinates with.

(iv) Main functions of front office.

1. Information
2. Reservation
3. Reception

b) House Keeping :

i) Introduction

ii) Layout of housekeeping department

iii) Organisation of housekeeping department

iv) Job description and qualities of house keeping staff

v) Departments that house keeping coordinates with

vi) Rooms and floors-Practices and procedures

1. Briefing and scheduling of staff
2. Knowledge of rooms
3. Rules on a guest floor
4. Cleaning of rooms
5. Preparing a room report

vii) Housekeeping control desk

c) Food and Beverages Production :

i) Definition of 'food technology'

ii) Aims and objectives of cooking food

iii) Cooking materials/ingredients

iv) Methods of cooking foods

v) Spices used in Indian and western cooking

vi) Principles of food storage.

vii) Planning of meals

viii) Preservation of food

d) **Food and Beverage Service:**

i) History of Indian catering

ii) Food and beverage outlets

iii) Classification of catering operations

iv) Restaurant organization

v) Service staff behaviour and standards

vi) Table layout and table manners

vii) Rules for waiting at table

viii) Forms/types of catering establishments i.e

1. Commercial (non residential & residential)
2. Welfare (industrial/institutional)
3. Transport (Air, Road, Rail, Sea)

ix) Origin of menu and menu planning objectives and types of menu

Note :

i) The Internal Assessment shall be based on periodical tests, written assignments, presentations, classroom attendance and participation.

ii) One tour/summer training is compulsory every year of which the students shall prepare *"A Tour Report"*, This report shall be evaluated by the examiner and shall given grades A, B & C.

Training : One Month

During the summer vacation one month training is a must and the internal assessment may be given the due weightage based on the training part of the candidate.

Theory will be of 80 marks and internal assessment based on the training part will carry 20 marks.

Tourism and Hotel Management (Vocational)

Paper-B

Time : 3 Hours **Max. Marks : 100**

Theory : 80

Int. Ass. : 20

Instructions for the paper setters :

Section-A will consist of 8 very short answer question with answers to each questions up to five lines in lengt h. All questions will be compulsory. Each question will carry two marks; total weightage being 16 marks.

Section-B will consist of short answer questions with answer to each question upto *two pages* in length. Twelve questions will be set by the examiner and eight will be attempted by the candidate. Each question will carry four marks. The total weightage of the section shall being 32 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry 16 marks: total weightage of the section being 32 marks.

i) The maximum marks are 100 of which 80 marks shall be of theory paper, and Internal Assessment shall carry 20 marks.

ii) The Internal Assessment shall be based on periodical tests, written assignments, presentations, classroom attendance and participation.

iii) One tour/summer training is compulsory every year of which the students shall prepare" A Tour Report". This report shall be evaluated by the examiner and shall be given grades A, B & C.

iv) The pattern of theory paper shall be as per the pattern of other undergraduate courses.

(I) Growth and development of tourism in India.

(II) Definition, nature and characteristics of tourism.

(III) Types and components of tourism

(IV) Impacts of Tourism

a) Socio-cultural impacts

b) Economic impacts

c) Environmental impacts

(V) Tourism as an industry

(VI) India a destination for all

(VII) Case study of ITDC

Note :

i) The Internal Assessment shall be based on periodical tests, written assignments, presentations, classroom attendance and participation.

ii) One tour/summer training is compulsory every year of which the students shall prepare "A Tour/Project Report". This report shall be evaluated by the examiner and shall be given grades A, B & C.

Training : One Month

During the summer vacation one month training is a must and the internal assessment may be given the due weightage based on the training part of the candidate.

Theory will be of 80 marks and internal assessment based on the training part will carry 20 marks.

Tax Procedure and Practice

Year	Paper	Periods per week		Marks	
		L	T	Ext.	Int.
Ist Year	**Paper-A : Indian Tax System & Law**	3	3	80	20
	Paper-B : State and Central Sales Tax	3	3	80	20

'On the Job Training' of 4 Weeks

The following pattern of setting of question paper shall be observed:

The question paper covering the entire course shall be divided into three sections as follows:-

Section A:

This section will consist of 7 very short answer questions with answer to each question upto 5 lines. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 14 marks.

Section B:

This section will consist of short answer questions with answer to each question upto two pages. Nine questions will be set by the examiners and the candidates will be expected to attempted six question. Each question will carry six marks, total weightage of the section being 36 marks.

Section C:

This section will consist of essay type questions with answers to each question upto 5 pages. Four questions,will be set by the examiner and the candidates will be expected to attempt two questions. Each question will carry 15 marks; total weightage of the section being 30 marks.

1. The internal assessment shall be based on periodical tests, written assignments and class-participation.
2. A consolidated report On the Job Training after Ist Year and IInd Year shall be prepared by every student and, must be

submitted in the college concerned upto Septempber 30. The consolidated report will be evaluated by the external examiner and shall be given the grades as follows:

O	-	Outstanding
A	-	Very Good
B	-	Good
C	-	Average
D	-	Unsatisfactory

In case the training report is rated as unsatisfactory, the candidate shall have to submit it again incorporating the changes suggested by the examiner, within one month from the date of intimation to the candidate by the concerned college.

Tax Procedure and Practice
Paper – A
Indian Tax System and Law

Time: 3 Hrs. **Max. Marks :External: 80**
Internal: 20

Note: The candidates are allowed to use simple (Non-Scientific) calculators.

Instructions for the paper setters:
The following pattern of setting of question paper shall be observed:

The question paper covering the entire course shall be divided into three sections as follows:-

Section A:

This section will consist of 7 very short answer questions with answer to each question upto 5 lines. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 14 marks.

Section B:

This section will consist of short answer questions with answer to each question upto two pages. Nine questions will be set by the examiners and the candidates will be expected to attempted six question. Each question will carry six marks, total weightage of the section being 36 marks.

Section C:

This section will consist of essay type questions with answers to each question upto 5 pages. Four questions,will be set by the examiner and the candidates will be expected to attempt two questions. Each question will carry 15 marks; total weightage of the section being 30 marks.

Section-A

Meaning of tax – Central and state powers of taxation. Distribution of revenues between central and states. Direct and indirect taxes.

Direct taxes of the central government – income tax, wealth tax, gift tax: interest tax act, 1974 with effect from 1.4.1993; expenditure tax act, 1987.

Indirect taxes of Central Government – Central Excise, Customs duty, Central sales tax.

Section-B

Taxes of the State Government: taxes on sale and purchase of goods tax on land and building octroi duty; tax on profession, trade and business; tool tax; tax on motor vehicle, transportation; tax on advertisement, tax on luxuries, entertainment and amusements; tax on betting and gambling; tax on electricity; tax on animal. Stamp duty, agricultural income tax; and land revenue.

Section-C

A income-tax Law, definitions, Residential Status, Incomes which do not form part of total income, Computation of total income, heads of income : salaries, income : from house property, profit & gain from business and profession, capital gains, income from other sources.

Clubbing Provisions, aggregation of incomes and set off and carry forward of losses, deduction from gross total income under chapter VIA.

References

1. Singhania, V.K. and K. Singhania (2007), Direct Taxes Law & Practice, Taxmann Publications (P) Ltd., New Delhi, 2004.
2. Srivastava, M. (1981), Fiscal Policy & Economic Development in India, Chugh Publications, Allahabad.
3. Mehrotra, H.C. & P. Mehrotra (2007), Income Tax Law & Accounts, Sahitya Bhawan Publications, Agra.
4. Taxmann's direct Tax Laws As Amended by Finance Act, 2007 Taxmann Allied Services (P) Ltd. New Delhi, 2001.
5. www.incometaxindia.gov.in

Tax Procedure & Practice

Paper-B

State and Central Sales Tax

Time: 3 Hours **Max. Marks : (External) : 80**

Internal : 20

Note: The candidates are allowed to use simple (Non-Scientific) calculators.

Instructions for the Paper Setters :

The following pattern of setting of question paper shall be observed:

The question paper covering the entire course shall be divided into three sections as follows:-

Section A: This section will consist of 7 very short answer questions with answer to each question upto 5 lines. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 14 marks.

Section B: This section will consist of short answer questions with answer to each question upto two pages. Nine questions will be set by the examiners and the candidates will be expected to attempted six question. Each question will carry six marks, total weightage of the section being 36 marks.

Section C: This section will consist of essay type questions with answers to each question upto 5 pages. Four questions,will be set by the examiner and the candidates will be expected to attempt two questions. Each question will carry 15 marks; total weightage of the section being 30 marks.

Section-A

State Sales Tax

1. Salient features of State Sales Tax act and rules made thereunder.
2. Important terms and definitions.

3. Incidental and levy of tax – when, what and how the tax is paid.

Registration of dealers – Compulsory registration; procedure for registration; application for obtaining registration under the prescribed form and requisite fee and security / surety for the purpose of registration and certificate of registration – amendment, cancelling and obtaining duplicate registration certificate and procedure thereof.

Rates of Tax :

Concessional rates – when availed.

Use of various kinds of forms for availing concessional rate under respective state, Sales tax procedure for applying for such concessional form and maintenance of records and issue and receipt of such declaration form and maintenance of records thereto. Return and procedure for recovery and refund of tax.

Deposit of sales tax and filling and filing of challan in the prescribed form.

Filling of return in the prescribed form and procedure for claiming refund of tax.

Section-B

Central Sales Tax

Regulatory framework— An overview of Central SalesTax, 1956; and Central Sales Tax (Registration and Turn over) Rules 1957. Important terms and definitions;

Important Terms and Definitions

Principles for determining— When central sales tax is leviable; the concept of sale or purchase of goods in the course of interstate trade or commerce.

When does a sale or purchase of goods take place outside the state; When does the sale or purchase of goods is in the course of import or export.

Registration of dealers and procedures thereof.

Grant of Certificate Registration in Form 3.

Procedure for amendment, cancellation and obtaining duplicate certificate of registration.

Section-C

Rates of Tax :

Concessional rate, kinds of forms for availing the concessional rates and maintenance of records related thereto.

Sales to the registered dealers against Form C.

Purchasers obligations : Procedure for obtaining Form C from Sales Tax authorities and Issuing of form C to dealers. Application under prescribed form with requisite fee for obtaining Form C. Maintenance of records for receipts and issue of Form C-Form 2.

Sellers obligations: Obtaining Form C from Purchasers. Maintenance of records of C Form collected and submission of C Form at the time of assessment.

References

1. Datey, V.S. (2006), Taxmann's Indirect Taxes Law & Practice, Taxmann Publications Pvt. Ltd., New Delhi.
2. Taxmann's Indirect Tax Laws as amended by Finance Act 2007. Taxmann Allied Services (P) Ltd., New Delhi, 2004.
3. www.income.tax.india.gov.in

Advertising Sales Promotion and Sales Management (Vocational)

Year Paper	Periods per Week		Marks	
Ist Year	L	T	Ext.	Int.
Paper-A Marketing Communication	3	3	80	20
Paper-B Advertising-I	3	3	80	20

'On the Job Training' of 4 Weeks

1. The internal assessment shall be based on periodical tests, written assignments and class-participation.
2. A consolidated report on the job training after Ist year and IInd year shall be prepared by every student and, must be submitted in the college concerned upto September 30. The consolidated report will be evaluated by the external examiner and shall be given in the grades as follows :

O	-	Outstanding
A	-	Very Good
B	_	Good
C	_	Average
D	_	Unsatisfactory

In case the training report as rated as unsatisfactory, the candidate shall have to submitted it again incorporating the changes suggested by the examiner, within one month from the date of intimation to the candidate by the concerned college.

Advertising Sales Promotion and Sales Management Objectives:

This course is intended to impart knowledge and develop skill among the participants in the field of marketing communication, so as to equip them to man junior and lower-middle level positions in the fast-growing and challenging business areas of advertising, sales promotion, selling and sales management and Public relations.

The course shall consist of six papers, two each of the three years of under graduate programme in the Indian Universities and other institutions. The six papers are:

1. Marketing Communication.
2. Advertising-I
3. Advertising-II
4. Personal Selling and Salesmanship.
5. Management of the Sales-Force.
6. Sales Promotion and Public relations.

All the papers will be handle so as to have practical orientation, with Indian cases and examples.

Advertising Sales Promotion and Sales Management (Vocational)

Paper-A

Marketing Communication

Time: 3 Hours **Max. Marks : External : 80**

Internal : 20

Instructions for the Paper Setters :

The following pattern of setting of question paper shall be observed:

The question paper covering the entire course shall be divided into three sections as follows :-

Section A: This section will consist of 7 very short answer questions with answer to each question upto 5 lines. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 14 marks.

Section B: This section will consist of short answer questions with answer to each question upto two pages. Nine questions will be set by the examiners and the candidates will be expected to attempted six question. Each question will carry six marks, total weightage of the section being 36 marks.

Section C: This section will consist of essay type questions with answers to each question upto 5 pages. Four questions,will be set by the examiner and the candidates will be expected to attemptted two questions. Each question will carry 15 marks; total weightage of the section being 30 marks.

Part-I

* Nature and importance of Communication.
* Communication process: Elements of the communication Process, Application of communication process in marketing. Steps in developing effective marketing communication.
* Methods of Marketing communication.

Part-II

* Advertising, personal selling, Public relations, sales promotion, their meaning and distinctive characteristics.
* Setting up of targets: Policies, strategies and methods of achievements.
* Integrated Communication in Marketing.

Suggested Readings:

1. Kotler Phillip, Kevn Lane Ketter, Abrahan Koshy and Mithileshwari Jha, Marketing Management, PHI, 13th ed., 2007.
2. Etzel, Michael J., Bruce J. Walker, William J. Stantonard Ajay Pandit. Marketing Concepts 1 Cases, 13th edition, Tat, McGraw Hill, 2006.
3. Rampal, M.K. and S.L. Gupta, Cases & Simulations is Marketing Management, Galgotia Publishing Co., 2000.

Advertising Sales Promotion and Sales Management (Vocational)

Paper-B

Advertising-I

Time : 3 Hours **Max. Marks : External 80**
Internal 20

Note : The candidates are allowed to use simple (Non-Scientific) calculators.

Instructions for the Paper Setters :

The following pattern of setting of question paper shall be observed:

The question paper covering the entire course shall be divided into three sections as follows:-

Section A: This section will consist of 7 very short answer questions with answer to each question upto 5 lines. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 14 marks.

Section B: This section will consist of short answer questions with answer to each question upto two pages. Nine questions will be set by the examiners and the candidates will be expected to attempted six question. Each question will carry six marks, total weightage of the section being 36 marks.

Section C: This section will consist of essay type questions with answers to each question upto 5 pages. Four questions,will be set by the examiner and the candidates will be expected to attempt two questions. Each question will carry 15 marks; total weightage of the section being 30 marks.

Part-I

* Importance of advertising in modern marketing. Role of advertising in the national economy.
* Types of advertising: Commercial and noncommercial advertising; primary demand and selective demand advertising; classified and display advertising; comparative advertising' co-operative advertising.

Part-II

* Setting of advertising objectives.
* Setting of advertising budget, Factors affecting the, advertising expenditure in a company.
* Advertising message, Preparing and effective advertising copy; elements of a print copy; headlines, illustration, bodycopy, slogan, logo seal of approval role of colon, elements of a broadcast copy, copy for direct mail.

Suggested Readings :

1. Batra, Rajeev, John G. Myers & David A. Aaker, Advertising Management, 5th ed., PHI, 2006.
2. Rampal, M.K. and S.L. Gupta, Cases & Simulations in Marketing Management, Galgotia Publishing Co., 2000.
3. Belch, George E and Michael A. Batch. Advertising & Promotion, McGraw Hill 2003.

COMMERCE

Paper -A

Commerce Theory and Functional Management

Time: 3 Hours **Max. Marks: 100**

Note (i) The candidates are allowed to use simple (Non-Scientific) calculators.

(ii) Each question paper may consist of three sections as follows:

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidate. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidate will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

A critical evaluation of various definitions of Commerce, Commerce Art or Science or both, Commerce as a Profession, Relationship and Difference between Economics, Commerce and Management, Functions of Commerce-Traditional and Modern. Management: Definition, purpose and significance. Management Art or Science for both.

Management as a Process: Planning, Organising, Staffing, Direction and Control and their meaning, Features and principles.

Contributions to Management thought with special reference to Taylor, Fayel, Elton Mayo.

Personnel Management: Meaning and significance, Managerial and operative Functions-Recruitment, Selection and training. Methods of wage payment, absenteism and labour turnover. Job evaluation and merit rating. Trade Unionism, worker's participation in management.

Marketing Management : Concept of Marketing, functions of marketing research-meaning and, techniques, advertising and salesmanship.

Production : Functions, production, planning and control, purchasing and storekeeping, inventory control, quality control.

Finance : Meaning and importance, sources of finance.

Suggested Readings

1. Bose Chandra, "Principles of Management and Administration", Prentice Hall of India, 2007.
2. Massie, "Essentials of Management", Fourth Edition, Prentice Hall of India, 2007.
3. Robbins and Coulter, "Management", 8th Edition, Prentice Hall of India, 2007.
4. Dholakia Nikhilesh and Khurana Rakesh, "Marketing Management", McMillan India Ltd., 2007.
5. Hitt, "Management", Pearson Education, 2007.

COMMERCE

Paper B

Book Keeping and Accountancy

Time: 3 Hours **Max. Marks : 100**

Note: (i) The candidates are allowed to use simple (Non-Scientific) calculators.

(ii) Each question paper may consist of three section as follows:

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Generally accepted accounting principles, concepts Convention. Theory and practice of Double entry system of book keeping.

Subsidiary Books and ledger, Trial Balance.

Bank reconciliation statement, Errors and their rectifications.

Preparation of trading profit and loss Account and Balance

sheet of sole trader and partnership. Treatment of capital and Revenue expenditure.

Preparation of receipts and payments account and income and expenditure accounts. Bills of exchange.

Elementary knowledge of consignment and joint venture. Indian System of book keeping (Mahajani lekha vidhi). 50% numerical problem should be asked.

Books Recommended

1. Bhattacharyya, "Financial Accounting for Business", Prentice Hall of India, 2007.
2. Grewal T.S. " Double Entry Book Keeping", Sultan Chand, 2007.
3. Tulsian P.C. "Financial Accounting", Pearson Education, 2007.
4. Maheshwari S.N. "Financial Accounting", Vikas Publications, 2007.
5. Horngren, "Introduction to Financial Accounting", Pearson Education, 2007.
6. Naryanaswamy, "Financial Accounting : A Management Perspective." Prentice Hall of India, 2007.

Note:
1. The candidates will visit major (trading/ manufacturing/ services) Organisation with view to be acquainted with the different systems of book keeping.
2. The college will organise atleast five lectures by experts/ professional.

   Accountants on final accounts/maintenance of different books of accounting.

Economics

Paper-A

Microeconomics

Time : 3 Hours **Max. Marks : 100**

Note : i) The candidates are allowed to use simple (Non-Scientific) Calculator.

ii) Each question paper may consist of three sections as follows:

Section : A It will consist of 10 very short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks. total weightage of the section being 20 marks.

Section :B It will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidate. Each question will carry six marks. The total weightage of the section shall be being 48 marks.

Section: C It will consist of essay type questions with answer to each question upto five pages in length. Four questions will be set by the examiner and the candidate will be required to attempt two. Each question will carry sixteen marks. The total weightage of the section being 32 marks.

Introductory: Definition of economics, Adam Smith, Marshall, Robbins, Basic concepts : Human wants, utility and satisfaction, opportunity cost, Price elasticity of demand and its measuement. Theory of demand and consumer behaviour : unity analysis and indifference curve analysis and their comparison.

Theory of production and costs : Concept of production function. Laws of returns to scale and law of variable production; cost : Modern costs theory concepts and costs curves in the short and in long run.

Relationship between average revenue and marginal revenue and elasticity of demand. Behaviour of average and marginal under perfect competition, Monopoly and Monopolistic competition. Price and output determination under perfect competition under short-run and long-run.

Monopoly: Producer's equilibrium in the short run and long run. Discriminating Monopoly. Monopolistic competition. Definition, Equilibrium of producer in the short run and long run; Marginal productivity theory; factor pricing (with reference to labour) under perfect competition and impact competition, Modern theory of distribution.

Rent : Concept; Ricardian Theory and Modern Theory of Rent.

Interest : Concept of interest; classical theory lonable funds theory;

Profit : Concept of profit, Risk and uncertainity theroies.

Recommended Texts

1. R.G. Lipsey: Introduction to positive economics, EL BS, London, 1969
2. Stonier & Hague: A Text book of Economics Theory, 9th ed., ELBS, London, 1973.
3. Paul Samuelson : Economics, Mcgraw Hill, Kogakushad, Tokyo, 1973.
4. N.C. Ray : Microeconomic Theory, Macmillan, Delhi, 1975.
5. D. Salvatore : Microeconomics.

Economics

Paper-B

Indian Economy

Time : 3 Hours **Max. Marks : 100**

Notes : i. The candidates are allowed to use simple (Non-Scientific) Calculator.

ii. Each question paper may consist of three sections as follows :

Section-A : It will consist of 10 very short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage being 20 marks.

Section-B : It will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidate. Each question will carry six marks. The total weightage of the section shall be 48 marks.

Section-C : It will consist of essay type questions with answer to each question upto five pages in length. Four questions will be set by the examiner and candidate will be required to attempt two. Each question will carry sixteen marks. The total weightage of the section being 32 marks.

Indian economy on the eve of dependence, Nature of Indian Economy.

Agriculture, causes of low productivity, Land reforms, need, implementation and critical evaluation, new agricultural strategy and green revolution, WTO and Indian agriculture.

Industry : Problems of industrial development, public sector and private sector, privatization of public sector enterprises : the disinvestment programme, role of small and large scale industries. Latest Industrial Policy.

Growth of money supply and price level, Causes and remedies of inflation, role of banks in development process, principle features of Indian tax structure, Centre-state financial relations; a brief idea of recommendations of the latest Finance Commission.

Foreign trade : direction and composition of exports and imports and changes therein since independence, recent foreign trade policies, Balance of payment problems. Foreign aid and role of multinational corporations in India.

Major problems of the economy - unemployment, poverty and inequality and population growth. Planning-objectives, strategy, achievements of planning in India, a brief idea of objectives, targets, resources of the latest five year plan.

Recommended Texts

1.	Mishra and Puri	:	Inidian Economy, Himalaya Publication House, Mumbai, 2003.
2.	Rudder Dutt and Sundharam	:	Indian Economy (Latest), S. Chand & Co. Ltd., New Delhi, 1998.
3.	A.N. Aggarwal	:	Indian Economy, Vikas Publications, Delhi, 1975.
4.	C.D. Wadhwa	:	Indian Economic Policy (1980), Tata McGraw Hill, Bombay, 1973.

Industrial Economics

Paper-A

Time : 3 Hours **Max. Marks : 100**

Notes : i. The candidates are allowed to use simple (Non-Scientific) Calculator.

ii. Each question paper may consist of three sections as follows :

Section-A : It will consist of 10 very short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage being 20 marks.

Section-B : It will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidate. Each question will carry six marks. The total weightage of the section shall be 48 marks.

Section-C : It will consist of essay type questions with answer to each question upto five pages in length. Four questions will be set by the examiner and candidate will be required to attempt two. Each question will carry sixteen marks. The total weightage of the section being 32 marks.

Nature, scope and subject matter of Industrial Economics; concept and organization of the firm; optimum firm.

Market Structure : Meaning and measurement : Sellers' concentration and product differentiation; Market structure, size and profitability.

Market Conduct : Theories of industrial location - Weber and Sargent Florence; factors affecting location; Product pricing - theory and evidence; merger and diversification; Sources of industrial finance.

Market Performance : Growth of the firm and its constraints; size, growth and profitability.

Process of Industrialization : Rationale, objectives, strategies and policies with reference to Indian industrial development and policy.

Recommended Texts

1. Barthwal, R.R. : Industrial Economics : An Introductory Text, Wiley Eastern Limited, New Delhi, 1984.
2. Devine, P.J. et al : An Introduction to Industrial Economics, George Allen Unwin Ltd., London, 1976.
3. Hay, D.A. and D.J. Morris : Industrial Economics : Theory and Evidence, Oxford University Press, London, 1979.
4. Harndeen, J.B. : Economics of Corporate Economy.
5. Writes, P.J.D. : Price, Cost and Output.
6. Kirkpatrick, C.M. et al. : Industrial Structure and Policy in Less Developed Countries, N.Lee and F.L. Ninson, Heritage, New Delhi, 1985.
7. Kelkar, V.L. and V.V. Bhanoji Rao : Indian Development Policy Imperatives.

Industrial Economics

Paper-B

Industrial Relations

Time : 3 Hours **Max. Marks : 100**

Notes : i. The candidates are allowed to use simple (Non-Scientific) calculator.

ii. Each question paper may consist of three sections as follows :

Section-A : It will consist of 10 very short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage being 20 marks.

Section-B : It will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidate. Each question will carry six marks. The total weightage of the section shall be 48 marks.

Section-C : It will consist of essay type questions with answer to each question upto five pages in length. Four questions will be set by the examiner and candidate will be required to attempt two. Each question will carry sixteen marks. The total weightage of the section being 32 marks.

Industrial Relations : Concept, approach and organisation.

Theory of Industrial Relations : Dunlop's industrial relation system; Classical Marxist Theory; human relation theory; Pluralism and radical approach.

Growth, pattern and structure of labour unions in India—achievements and failures.

Nature and Causes of industrial disputes - settlement and prevention mechanism; Role of tripartism.

Collective Bargaining : Theories, types and role; current trends in collective bargaining.

Labour legislation in India with reference to Trade Union Act, 1926 Industrial Disputes Act, 1947.

Recommended Texts

1. Giri, V.V. : Industrial Relations, N.M. Tripathi Asia Publications, Bombay, 1972.
2. Memoria. C.B. : Dynamic of Industrial Relations in India, Himalaya Publishing House, Bombay, 1983.
3. Myers, C.A. : Industrial Relations in India, Asia Publishing House, Bombay, 1970.
4. Ramaswamy, E.A. and U. Ramaswamy : Industrial Relations in India, Macmillan, Delhi, 1978.
5. Punekar, SD. : Labour Welfare, Trade Unionism and Industrial Relations, Himalaya Publishers, Bombay, 1978.
6. Rees, A : Economics of Work and Play.

Quantitative Techniques

Paper-A

Time : 3 Hours. **Max. Marks : 100**

Note: **(i) Economic applications of the above techniques may also be asked.**

(ii) The candidates are allowed to use simple (Non-Scientific) calculators.

(iii) The question may consist of three sections as follows :

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Solution of linear equations : quadratic equations, solution of simultaneous equations—two variable case. Series : Arithmetic progression series, geometric progression series.

Elements of Analytical Geometry : the straight line, circle, parabola.

Elements of Trigonometry: basic concepts and formulae. Elements of set theory, union, inter-section, difference, symmetric difference, complementation, various diagrams.

Limits and Continuity of Function : Function and their graphs, classification of functions, graphs, linear, quadratic and rectangular Hyperbola functions, Limits of functions, continuity of functions.

Derivatives : Theorems of Derivatives, functions of functions rule, derivative of inverse functions, derivatives of implicit functions, parametric functions, and their derivatives, exponential functions, logarithmic functions, successive derivatives.

Books Recommended

1. Monga, G.S. : Mathematics and Statistics for Economics.
2. Yamane, Taro : Mathematics for Economists.
3. Allen, R.G.D. : Mathematical Analysis for Economists.

Quantitative Techniques

Paper-B

Time : 3 Hours. **Max. Marks : 100**

Note **(i) The candidates are allowed to use simple (Non-Scientific) calculator.**

(ii) Each question paper may consist of three sections as follows:

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answers to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Statistics, definition, scope, significance, limitations, statistical enquiry, organisations of statistical survey, classifications of data, tabulation, graphical representation of data.

Median, quartiles, declies, percentiles, measures of relative dispersion, measures of skewness and kurtosis.

Correlation Analysis : Introduction, significance, Karl-Pearson's coefficient of correlation, probable error, Spearman's rank correlation coefficient, Simple Regression : Analysis : Difference between correlation and regression, lines of regression, relationship between correlation coefficients and regression coefficients.

Analysis of Time Series : Definition, components of time

series, measurement of trend by different methods, measurement of seasonal variations.

Probability : Definition, Additive & Multiplicative laws and their applications.

Books Recommended

1. Gupta, S.P. : Statistical Methods (1981)
2. Croxton, Cowden & Klein : Applied General Statistics 1973
3. Ya-lun-chou : Statistical Analysis (1975)
4. Kapur and Sexena : Mathematical Statistics (1970)
5. Murry, R. Speigal : Theory and Problems of Statistics (1972).

Agricultural Economics and Marketing
Paper-A

Time : 3 Hours **Max. Marks : 100**

Note (i) The candidates are allowed to use simple (Non-Scientific) calculator.

(ii) Each question paper may consist of three sections as follows:

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Agriculture in a growing economy : changing importance of agriculture, inter-dependence between agriculture and industry, role of agriculture in economic development.

Farming Systems : traditional, subsistence, commercial, cooperative, collective and state farming, corporate farming, contract farming.

Economics of Agricultural Production : Relation between factor-product, product-product and factor-factor, farm size productivity in Indian Agriculture.

Agricultural Growth in India : Inter-regional variations in growth in output and productivity.

Performance of Punjab Agriculture : A Comparative

Analysis.

Suggested Readings

1. Southworth, N, and A. Johnston (1967), Agricultural Development and Economic Growth, Cornell University Press.
2. Dantwala, M.L. (1986), Agricultural Growth in India, Indian Society of Agricultural Economics, Bombay.
3. Bhardwaj, K. (1984), Production Conditions in India Agriculture, Cambridge University Press.
4. Memoria, C.B. (1985), Agricultural Problems of India, Kitab Mahal.
5. Eichher, C. and L. Wilt (ed.) (1964), Agriculture in Economic Development, McGraw Hill, London.
6. S.S. Johl & T.R. Kapur, Fundamentals of Farm Business Management.
7. A.S. Kahlon & Karam Singh, Principles of Farm Business Management.
8. Agriculture Economics by R.K. Lekhi and Joginder Singh. Kalyani Publishers 1996.

Agricultural Economics and Marketing
Paper B
Agricultural Marketing

Time : 3 Hours. **Max. Marks : 100**

Note (i) The candidates are allowed to use simple (Non-Scientific) calculator.

(ii) Each question paper may consist of three sections as follows:

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Marketing : Definition, scope, product, production, selling and marketing concepts, marketing efficiency, farmers and marketing.

Consumer-market and buying behaviour, trends in population and income distribution variations in food consumption, market segmentation. market, integration, market consideration.

Agricultural production in India : Farm size, land utilization and cropping pattern, characteristics of producer and production.

Variations in production-seasonal, annual, geographic and quality, Marketed and marketable surplus.

Agricultural Marketing in India, structure, type and defects, marketing function, processing and standardisation, grading, transportation, distribution and storage, marketing agencies.

Suggested Readings

1. Cundiff, Still & Goveni, Fundamentals of Modern Marketing.
2. Memoria, C.B., Agricultural Problems of India.
3. Bansil, P.C., Agricultural Problems of India.
4. Rudder Dutt and Sundram, Indian Economy.
5. Indian Council of Agricultural Research, Handbook of Agriculture.
6. S.S. Acharya Marketing of Farm Products.
7. Fundamentals of Agri. Economics, Sadhu & Singh, Himalyan Publishers House, 1996.

Rural Development

Paper-A : Rural Society

Time : 3 Hours **Max. Marks : 100**

Total Teaching Periods : 75

Note (i) The candidates are allowed to use simple (Non-Scientific) calculator.

(ii) There will be two papers of one hundred credit marks each, (Three periods per week per paper).

(iii) Each question paper may consist of three sections as follows:

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Conceptional Sociology as a study of social groups, Relationships, Institutions and culture, Rural urban differences.

Caste, its features, functions, theories of its origin and intercaste relations.

Family types, functions and changing patterns.

Marriage, its forms, functions and features like bride/ bridegroom price, extravagance etc.

Political structures; structures and functions of traditional and enacted panachayats.

Suggested Readings

1. Hutton, J.H. Caste in India, Oxford University Press, Bombay.
2. Mandelbaum, D.G. Society in India, Popular Prakashan, Bombay.
3. Jammu, P.S. (Ed). Pendu Punjab Vich Samajik Parvartan, Punjabi University, Patiala.
4. Swinderjit Kaur. Samaj Vigyan Nal Jan Pachhan, Punjabi University, Patiala.
5. Baldev Singh (tr.) Samaj Vigyan, Punjabi Univeristy, Patiala.

Rural Development

Paper - B

Rural Administration

Time : 3 Hours **Max. Marks : 100**

Total Teaching Periods 75

Note (i) The candidates are allowed to use simple (Non-Scientific) calculator.

(ii) Each question paper may consist of three sections as follows:

Section-A will consist of 10 very short answer questions with answers to each question upto five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage of the section being 20 marks.

Section-B will consist of short answer questions with answer to each question upto two pages in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry six marks; total weightage of the section being 48 marks.

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry sixteen marks; total weightage of the section being 32 marks.

Rural Development; Concept and Objectives; Rural Development since Independence; Community Development Programme (C.D.P.), National Extension Service (N.E.S.), High Yielding Varieties Programme (H.Y.V.P.), Intensive Agricultural District Programme (I.A.D.P.), Small Farmers Development Agencies (S.F.D.A), and Marginal Farmers and Agricultural Labour Agencies (M.F.A.L.A.). Integrated Rural Development Programme (I.R.D.P.), Training of Rural Youth for Self Employment (TRYSEM), National Rural Employment Programme (N.R.E.P.).

Organisation Set up : Ministry of Rural and Agriculture Development at the Central Level Planning and Planning Machinery, Deptt. of Agriculture, Development of Industries at the State level.

Panchayti Raj : Rural Development, District Administration and Rural Development.

Planning at local, Deputy Commissioner and other functionaries dealing with rural development.

Books Suggested

1. Sharma, S.K. : Rural Development Approach Perspective and Strategy, Abhinav Publications, New Delhi.
2. Mehta, S.R. : Rural Development Policies and Programmes.
3. Jain, S.C. : Community Development and Panchayati Raj in India, NIRD Publications, Hyderabad.
4. Raw, S.K. : Rural Development in India, Some Factors in India, NIRD Publications, Hyderabad.
5. Puri, K.K. and G.S. Brown : Local Government in India, Bharat Pakistan, Jalandhar.

Dairy Farming (Vocational)

(Theory)

Time: 3 Hours

Period per week : Theory : 6 **Max. Marks: 100**

Instructions for the paper setter

1. Question paper should be set strictly according to the syllabus and in the Punjabi Language.
2. The language of questions should be straight and simple.
3. Theory paper shall consist of three parts :
   a) Ten short compulsory questions of two marks each requiring replies up to five lines each

      (Total marks: 10x2=20 marks).

   b) Ten questions of six marks each requiring short replies shall be asked. The candidate has the choice to attempt eight questions (Total marks 8x6=48).

   c) Four questions of descriptive type requiring five pages for each answer shall be asked. The candidate has the choice to attempt two questions. (Total marks : 16x2=32)
4. The question paper should cover the whole syllabus.

General

Advantages and constraints in dairy farming. Importance of livestock in agriculture and its relation to national economy. Live stock census, Milk production in Punjab, India, Per capita consumption of milk in Punjab and India as compared to some western countries.

Breeds

Important breeds of different livestock species, their origin, morphological traits and economic traits :

i) Indigenous cattle i.e. Sahiwal, Haryana, Red Sindhi.

ii) Exotic cattle, i.e. Holstein Friesian, Jersey, Red Dane, Brown swiss, Ayrshire and Guernsey.

iii) Buffaloes breeds, i.e. Murrah, Nilli Ravi, Surti, Mehsana.

iv) Milch type goat breeds (both Indian and Exotic)

Anatomy and Physiology

Anatomy & Physiology of udder. Milk synthesis and its secretion

including let down of milk.

Digestive and reproductive system of cattle

Feeding Practices

Classification of feeding stuffs. Study of roughages and concentrates. Silage and hay making. General principles of feeding cattle & buffaloes.

Management

i) General care of cattle, grooming, exercise, bathing, oestrus observation, care during pregnancy, parturition, milking, clean milk production, drying off.

ii) Care of calves: Care and feeding of weaned calves, Identification marks (tattooing, branding and ear tagging) disbudding and castration etc.

iii) Principles of grading up in cattles. Various systems of breeding i.e. inbreeding, out breeding and crossbreeding. Importance of Sire & Dam.

iv) Artificial insemination, Merits and Demerits thereof.

Housing

Location of dairy farm, grouping of different farm buildings. Sanitation, drainage in cattle sheds, disinfections of sheds. Heat stress. Methods of cooling in sheds. Supply of clean and fresh water.

Diseases and their Control

Common infections and contagious diseases, their causes, symptoms and treatment. Vaccination schedule. Deworming and tick control.

Dairy Farming (Vocational)

Practical

Time : 3 Hours. **Period Per Week 4**

Max. Marks : 100
Practical Marks : 80
Internal Ass : 20

Distribution of Marks :

Assignment	20 Marks
Practical Note Book	20 Marks
Two Visits to Dairy Farm	20 Marks
Oral Examination	20 Marks
Internal Assessment	20 Marks
Total	:100 marks

Syllabus

Note : Preparation of practical note book and weekly write-ups of daily jobs assigned is compulsory.

1. Visits to Dairy farms having machine milking, fodder harvesting, feed mixing etc., Veterinary hospitals, Milk collection centre and milk plant. Visit and working study of Milk Producers Co-operative Society.
2. External body parts of Cow and Buffalo.
3. Identification of various breeds of Cows and Buffaloes.
4. Differentiation between 'Desi' and Crossbreed Cow and their calves.
5. Identification of various feed stuffs.
6. Identification and numbering of animals :

   a) Tattooing, b) Notching, c) Branding, d) Eartagging
7. Disbudding : Caustic touch, Hot iron method, Eclectric dehorner.
8. Collection of semen, its evaluation and extension (Demonstration only)
9. Techniques of artificial insemination (Demonstration only).

Physical Education

Paper-A

Time : 3 Hours **Max. Marks : 60**

Notes : Question paper will be divided into three sections.

Section A : The candidates are required to attempt all the six questions. Each question carrying two marks.

6x2=12 marks.

Section B : The candidates are required to attempt seven out of twelve questions. Each question carrying four marks.

7x4=28 Marks.

Section C : The candidates are required to attempt two out of four questions. Each question carrying ten marks.

10x2=20 Marks.

Part-A

1. Definitioin of the terms : Education, Physical Education, Physical Training and Coaching.
2. Aims and Objectives of Physical Education.
3. Relationship of Eduction and Physical Education.
4. Biological Principles :
   a) Growth and Development
   b) Age and sex differences
   c) Effect of heredity and environment on growth and development.
   d) Chronological age, physiological age, Anatomical age and Mental age.
   e) Body types.

Part-B

1. **Development of Physical Education and Sports in India.**
   a) Pre-Independence

b) **Sports Schemes in India :**

i) N.S.N.I.S.

ii) Sports Authority in India.

iii) Punjab Sports Department.

iv) Punjab State Sports Council.

c) Sports Organisations in India i.e. Associations. Federation and D.O.A, P.O.A., I.O.A.

2. **Olympics Games :**

a) Ancient Olympics.

b) Modern Olympics.

3. **Commonwealth Games**

4. **Asian Games**

Practical : 40 (Internal Assessment 10; Practical 30)

Any one Game, Ground-marking, Practical Note Book.

Physical Education (Teaching)

New books recommended for the syllabus of B.A. Part-Ist, 2nd and 3rd are as under :-

1. Singh Kanwaljeet and Singh Inderjeet : Sports Sociology, Friends Publication, New Delhi, 2000.
2. Tadan D.K. et al, : Scientific basis of Physical Education and Sports, Friends Publication, New Delhi, 2001.
3. Singh Ajmer and Gill Jagtar : Essentials of Physical Education and Olympic Movement, Kalyani Publishers, Ludhiana, 2004.
4. Kang G.S. : Anatomy, Physiology and Health Education, Publication Bureau, Punjabi University, Patiala, 2000.
5. Kang G.S. and Deol N.S. : An Introduction to Health and Physical Education 21st Century, Patiala, 2008.
6. Dhillon G.K. : Health Education, Punjab Text Book.

Physical Education

Paper-B

Time : 3 Hours **Max. Marks : 60**

Notes : Question paper will be divided into three sections.

Section A : The candidates are required to attempt all the six questions. Each question carrying two marks. 6x2=12 Marks.

Section B : The candidates are required to attempt seven out of twelve questions. Each question carrying four marks.

7x4=28 Marks.

Section C : The candidates are required to attempt two out of four questions. Each question carrying ten marks. 10x2=20 Marks.

Part-A

1. Cell : Structure and Functions.
2. Skeletal System : Types of bones, names of the various bones of the body, Various types of Joints.
3. Muscular System : Various types of muscles, structure of skeletal muscles.
4. Digestive system : Its organs and mechanism of digestion.
5. Nutrition : Elements of balanced diet, Functional Diet/Food

Part-B

1. Meaning and scope of health education. Hygiene problems of educational institutions and their remedial measures.
2. Personal hygiene; Care of eyes, teeth, ears, skin, hair and nail.
3. Air and water pollution and its remedial measures.
4. First aid in case of snake bite, drowning, electric shock and burns.
5. Effect of Alcohol, smoking on health and doping in sports.
6. Communicable Diseases : Mode of transmission, prevention and control of tuberculosis, hepatitis (A & B), Rabies and HIV/AIDS.

Practical : 40 Marks (Internal 10, External 30)

One Throw One Jump One Race

Education

Paper-A

Philosophical and Sociological Foundation of Education

There will be two papers of 100 marks each. (Six priods per week)
Total Teaching Periods: 150 (each paper)

Time : 3 hours **Total Max. Marks: 200**

Max. Marks: 100

Note: (i) In all eight questions to be set, four from each section.

(ii) A student will be required to attempt five questions selecting, at least two from each section.

Section-I

1. Meaning, nature, scope and functions of education. Formal, Informal and Non-formal education.
2. Aims and Objectives of Education, factors determining aims of Education.
3. Analysis of concept of Education : Schooling, Training and Indoctrination.
4. Commission (1964- 66) and NPE (1986), aims of education in the Modern Indian Society.

Section-II

1. Home, school and community and mass media as agencies of education.
2. Education for democratic citizenship.
3. Education for national integration.

Books Recommmended

1. Bhatia and Narang Philosophical & Sociological Foundation Education Doaba House, New Delhi, 1992.

2. Dayakar, Reddy, D Value Oriented Education, Discover Publishers, 2006.

3. Dhaliwal, A.S. Vidyak Manovigyan, Punjabi University, Patiala, 1985.

4. Dash., D.N. Philosophical and Sociological

	Foundation of Education, Dominant Publisher, New Delhi, 2005.
5. Govt. of India, Ministry	Report of Secondary Education Commission (1952-53).
6. Prasad and Chandra	Sociological Foundations of Education, Deepak KSK Publishers, Delhi, 2006.
7. Saxena Swaroop, N.R.	Education In Emerging India Chaturvedi Sikha Society, R.Lall Book Depot, Meerut, 2005.
8. Sodhi, T.S.	Philosophical and Sociological Foundations of Education, Bawa Publications, Patiala, 2007.
9. Taneja, V.R.	Foundation of Education, Chandigarh, Mahindra Capital, Punjab, 2006.

Education

Paper-B

Psychological Foundations of Education

Time : 3 Hours **Max Marks: 100**

Instructions for Paper Setters :

Note: **(i) In all eight questions to be set, four from each section.**

(ii) A student will be required to attempt five questions selecting, at least two from each section.

Section-I

1. Meaning of Psychology, Relationship between Education and Psychology.
2. Educational Psychology : Meaning, Nature and Scope.
3. Growth and Development : Meaning and Stages and Principles.
4. Determinants of Behaviour : Heredity and Environment-Concept and Role.

Section-II

1. Physical, mental, social, emotional characteristics, needs and Problems of Indian Adolescents.
2. Concept and Elements of Mental Health. Need of mental health for students & teachers.
3. Meaning of Instincts, Emotions and Sentiments and their role in education.
4. Personality : Meaning and Dimensions, Factors affecting Personality.

Books Recommended

1. Mohan, G..A. Educational Psychology, Neelkamal Publications PVT. LTD., New Delhi. 2007.

2. Mathur, S.S.	A Sociological Approach to Indian Education, Vinod Pustak Dirandi, Agra-2 (1985).
3. Bhatia, K.K.	Bases of Educational Psychology, Kalyani Publishers, New Delhi. (2003).
4. Clifford Morgan, King, R.R. and Weisz, John.	Introduction to Psychology. Tata Mc Graw Hill Publishing Company Ltd., New Delhi. (1999)
5. Chauhan, S.S.	Advanced Educational Psychology Vikas Publishing House, New Delhi. (2002).
6. Mangal, S.K.	Advanced Educational Psychology, Prentice Hall of India, New Delhi 2002.

Drm EiDEn

ppr-e (B`rql Drm)

sm~ : 3 Gt lkcr~ dl igxql : 75

p`s hx lel Ek: 35% **kl Ek : 100**

ppr str lel hd`ieq~ :

ppr d pj B`g hxg: a, E, e, s Eq h; B`g a, E, e, s ivcl 2-2 pSn pC j`xg| ividE`rQlE~ n iek-iek pSn krn` hvg` Eq hr iek pSn d 15 Ek hxg| kl 60 Ek hxg| B`g 'h' ivcl sKp a#qr~ v`l 10 pSn krn hxg, ijhV s`r islbs ivcl hxg Eq an~ d 40 Ek hxg| hrk pSn d 4-4 Ek hxg|

pliKE`rQl lel hd`ieq~ :

B`g a,E,e,s ivcl kvl iek-iek pSn krn` h Eq B`g 'h' d s`r pSn zrrl hn|

B`g (a) vidk mq

1. vd—j`x pC`x, vidk wg dlE~ m`nq`v~ (bll Eq wg)
2. vidk dvq : vrx, Egnl, iedr
3. Bgvq glq`—j`x pC`x, krm Eq Bgql

B`g (E) jn-mq

1. Bgv`n mh~vlr—bcpn, ighsq, Gr-iqE`g, qpisE` Eq igE`n-p`pql|
2. mK isD~q : (pj mh~vrq) Eihs`, sqw, Esqw, Epirgh Eq bhmcrw|
3. krm Eq mkql|

B`g (e) bD-mq

1. Bgv`n bD—bcpn, ighsq, Gr-iqE`g, qp Eq igE`n-p`pql|
2. mK isD~q (c`r E`rlE` sqw)—dK, dK d` k`rn, dK inivql Eq dK inivql d` m`rg|
3. Dmpd—sKp j`x pC`x Eq niqk jlvn d lCx|

B`g (s) pmK E`Dink B`rql icqk

1. ivvk`nd : jlvn Eq Drm d` E`Dink sklp
2. r`ibdr n`Q tgr : jlvn Eq mnK d` sklp

3. sl Erivd : jlvn Eq wg-mq d` sklp

sJ`elE~ psqk~ dl scl

1. S~ql n`Q gpq`, *B`rql drSn* (pj`bl), stt wnlvristl tkst bk brf, cflgV|
2. hrp`l isG pn, *p`cln B`rql Drm*, pj`bl wnlvristl, pitE`l`|
3. dljlq isG, *B`gvd glq`* (pj`bl Env`d)
4. bl.Es. r`ie Bl`, *E`Dink B`rql drSn dlE~ kJ mK pivrqlE~,* pj`bl wnlvristl, pitE`l`|
5. v. brdv, *E`Dink sml ivc B`rql Pls&`,* pj`b bk sltr, cflgV|
6. Harbans Singh & L.M. Joshi, *An Introduction to Indian Religions,* Punjabi University, Patiala.
7. E`r.fl. inr`k`rl, *vidk S`sqrl k` sm`ijk pircw* (ihdl), vd~q pk`Sn, pitE`l`|
8. बसन्त कुमार लाल, *समकीलन भारतीय दर्शन,* मोतीलाल बनारसी दास, दिल्ली, 2006.
9. आर.डी. निराकारी, *वैदिक शास्त्री का समाजिक परिचय,* वेदांत प्रकाशन, पटिआला।

Drm EiDEn

ppr-bl (isK Drm)

sm~ : 3 Gt| lkcr~ dl igxql: 75

p`s hx lel Ek : 35% **kl Ek : 100**

ppr str lel hd`ieq~ :

ppr d pj B`g hxg : a, E, e, s, Eq h; B`g a, E, e, s, ivc 2-2 pSn pC j`xg| ividE`rQlE~ n iek-iek pSn krn` hvg` Eq hr iek pSn d 15 Ek hxg| kl 60 Ek hxg| B`g 'h' ivc sKp a#qr v`l 10 pSn hxg, ijhV s`r slbs ivc hxg Eq and 40 Ek hxg| hrk pSn d 4-4 Ek hxg|

pliKE`rQl lel hd`ieq~ :

B`g a, E, e, s ivc kvl iek-iek pSn krn` h Eq B`g 'h' d s`r pSn zrrl hn|

B`g (a) ieiqh`sk pK

1. isK Drm d` ipCkV
2. isK Drm d` ieiqh`sk ivk`s
3. gr n`nk dv, gr Emrd`s, gr r`md`s, gr Erjn dv jl dl siKpq dx

B`g (E) sl gr gQ s`ihb

1. sp`dn`
2. binE`dl isD~q : prm`qm` Eq jlv
3. r`g pbD : s`rQkq` q mhqv

B`g (e) binE`dl ssQ`v~

1. gr : srp q sklp
2. sgq, pgq q grdE`r`
3. sl Ek`l q^q s`ihb

B`g (s) pmK lihr~ : E`rB, ivk`s q wgd`n

1. n`mD`rl
2. isG sB`
3. grdE`r` sD`r lihr

B`g (h) sKp a#qr~ v`l 10 pSn

sJ`elE~ psqk~ dl scl :

1. f`. gf` isG, qj` isG, *isK ieiqh`s,* B`g pihl`, pj`bl wnlvristl, pitE`l`|

2. srdl isG kvlSr, *isK Drm drSn,* pj`bl wnlvristl, pitE`l`|
3. f`. Sr isG, *grmiq drSn,* Smxl grdE`r` pbDk kmtl, Eimqsr|
4. f`. jsblr isG E`hlv`lIE`, *isK Pls& dl Bimk`,* rGblr rcn` pk`Sn, cflgV|
5. f`. mihdr kr igl, *gr gQ s`ihb dl sp`dn` kl`|*
6. ipE`r` isG pdm, *sl gr gQ pk`S,* klm midr, lEr m`l, pitE`l`|
7. p. q`r` isG, *v`dn kl`,* pj`bl wnlvristl, pitE`l`|
8. f`. grn`m isG, *grmiq sglq: pbD q pk`S,* pj`bl wnlvristl, pitE`l`|
9. f`. q`rn isG, *gr gQ s`ihb d` s`ihqk ieiqh`s,* Smxl grdE`r` pbDk kmtl, Eimqsr|
10. smSr isG ESk, *pj`b dlE~ lihr~,* ESk psqkm`l`, pitE`l`|
11. gf` isG (sp`.) *pj`b* (B`el jD isG EiBndn gQ) pj`bl s`ihq Ek`dml liDE`x`|
12. Ganda Singh (Ed.), *Punjab : Past and Present* (Singh Sabha Issue), Punjabi University, Patiala.
13. J.N. Farquhar, *Modern Religious Movements in India,* Munshi Ram, Manohar Lal, New Delhi.
14. Teja Singh, *Ideals and Institution of Sikhism*, Khalsa Brothers, Amritsar.
15. f`. nirdr kr B`tlE`, f`. jsivdr kr iFl (sp`.), pmK isK ssQ`v~, gr n`nk dv wnlvristl, Eimqsr|

Philosophy

Paper-A : Elementary Philosophy

Time : 3 Hours **Max. Marks : 100**

Lectures to be delivered : 75 **Pass Marks 35%**

Instructions for the paper-setters

The question paper will consist of five sections A,B,C,D and E. Sections A,B,C and D will have two questions from the respective sections of the syllabus and will carry 15 marks each. Section E will consist of 10 short answer type questions and will cover the entire syllabus uniformly and will carry 40 marks in all, each short answer type question carrying 4 marks.

Instructions for the candidates

Candidates are required to attempt one question each from the sections A,B,C and D of the question paper and the entire Section E.

Section-A

1. An Introduction to Philosophy : Definition, Meaning and Uses.
2. Introduction to the Branches of Philosophy : Metaphysics, Epistemology and Ethics.
3. Relation of Philosophy with Religion.

Section-B

4. Human Rights : Definition and Scope.
5. Social Justice : Problems and Solution of Casteism and Gender Discrimination.
6. World Peace : Problems and Solution.

Section-C

7. Sikhism : Sangat, Pangat and Sarbat da Bhala.
8. Vivekanand : Humanism.
9. Gandhism : Ahimsa and Satyagrah.

Section-D

10. Culture : Definition and Components
11. Culture and Civilization.
12. Culture and Religion.

Section-E

Ten short answer type questions.

Recommended Readings

1. Teja Singh, *Sikhism; Its Ideals & Institutions,* Khalsa Brothers, Amritsar, 1970.
2. H.H. Titus, *Living Issues in Philosophy,* Eurasia, New Delhi, 1968.
3. V.S. Narvane, *Modern Indian Thought; A Philosophical Survey,* Asia, Bombay, 1967.
4. J.S. Mackenzie, *Outlines of Social Philosophy,* Allen and Unwin, London, 1963.
5. B.K. Lal, *Contemporary Indian Philosophy,* Motilal Banarsidas, Delhi, 1978.
6. Alan Wingate, *Human Rights, Comment and Interpretation,* UNESCO, 1949.
7. Human Rights (NCERT)
8. jsivdr kr iFl Eq nirdr kr B`tlE` (sp`dk), *pmK isK ssQ`v-,* gr n`nk dv wnlvristl, Eimqsr|
9. U. Chandra, *Human Rights,* Allahabad Law Agency, Allahabad, 2000.
10. Robert and Beck, Handbook of Social Philosophy.
11. Dr. S.P. Gautam, *Samaj Darshan,* Haryana Sahit Academy, Panchkula.
12. Dr. Himat Singh Sinha, *Sanskrit Darshan,* Haryana Sahit Academy, Panchkula.

Philosophy

Paper-B : Ethics : Western and Indian

Time : 3 Hours **Max. Marks. : 100**

Lectures to be delivered 75 **Pass Marks 35 %**

Instructions for the paper-setters

The question paper will consist of five sections A,B,C,D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15 marks each. Section E will consist of 10 short answer type questions and will cover the entire syllabus uniformly and will carry 40 marks in all, each short answer type question carrying 4 marks.

Instructions for the candidates

Candidates are required to attempt one question each from the sections A,B,C and D of the question paper and the entire Section E.

Section-A

1. Nature, Scope and Utility of Ethics.
2. Relation of Ethics with Religion.

Section-B

3. Plato on Virtues.
4. Kant : Categorical Imperative, Good Will.
5. Hedonism : Bentham, Mill.

Section-C

6. Bhagavad Gita : Nishkama Karma.
7. Sikhism : Virtues (Truthful Living and Service)

Section-D

8. Buddhism : Four Noble Truths and Eight Fold Path
9. Yoga Sutras of Patanjali : Definition and Ashtangyoga
10. Jainism : Tri Ratna and Kavalya.

Section-E

Ten short answer type questions.

Recommended Readings

1. Balbir Singh, *Principles of Ethics,* S. Nagi in Jalandhar, 1978.
2. S.N. Gupta, *Niti Shastra* (Punjabi).

3. Ved Parkash Verma, *Niti Shastra* (Hindi), Allied Publishers, New Delhi, 1987.
4. William Lillies, *An Introduction to Ethics,* Methuen, London, 1957.
5. J.S. Mackenzie, *Mannual of Ethics*
6. Avtar Singh, *Ethics of the Sikhs,* Punjabi University, Patiala, 1970.
7. f`. S-ql n`Q gpq`, *B`rql drSn,* pj`b stt wnlvristl, tkst bk brf, cflgV, 1974.
8. f`. E`r.fl. inrk`rl, *B`rql drSn|*

Music (Instrumental)

Scheme

Paper-A : Theory : 3 Hours Durations Max.Marks : 80

Paper-B : Practical : 100 Marks

Internal Assessment based on the Computer : 20 Marks

Total Marks : 200 Marks

Teaching work load :

Theory : 3 Periods per week

Practical : 9 Periods per week

Note : There should not be more than ten students in one group of practical class.

Instructions given to the examiners are as under :

1. There should not be more than ten students in a batch for practical examinations.
2. While sending the syllabus to paper setter in theory the syllabus prescribed for practical paper should also be sent.
3. Separate practical paper should be set for each class from Practical Paper-B prescribed syllabus.
4. The paper setter will set nine questions in all. Three in Unit-I, four in Unit-II & two in Unit-III. The candidate may be asked to attempt five question in all selecting at least one question from each part.
5. The practical paper will be of 100 marks for the private & regular candidates. 20 marks for the Internal Assessment based on the Computer in the form of presentation relating to any field of music (approx. 3 to 5 pages) using computers. (MS-Office) which will be evaluated by the external examiner at the time of examination. Separate mark sheet should be used for Internal Assessment based on the computer.
6. Candidate can take both subjects i.e. Vocal & Instrumental Music as elective subject.
7. Candidate can take Tabla Subject along with Instrumental Music mentioned below at Serial No. 8
8. In Instrumental Music the canndiate have the option to take any

swar vadhya one of the following instrumentals :-

Sitar, Sarangi, Veena, Sarod, Dilruba, Violin, Guitar, Bansuri, Shahnai, Rabab, Saranda, Taus, Santoor and any other Swar Vadhya to be Played on the basis of Indian Classical Style.

Music (Instrumental)

Paper-A
(Theory)

Time : 3 Hours **Max.Marks : 80**

Unit-I

1. History of your own Instrument.
2. Classification of Indian Musical Instrument & their changing scenario in modern period.
3. Definition and explanation of the following Musical terms :

Various Boles of Mizrab, Chal and Achal Thata, Baj, Ashraya and Janya Rag, Shudh, Chayalag and Sankiran Raga.

Unit-II

1. The role of elctronic media in music.
2. Life Sketches and their Contribution toward indian Music:-
   - i) Alau-din Khan
   - ii) Abdul Aziz Khan
   - iii) Panna Lal Ghosh
   - iv) Pt. Ravi Shankar
3. Description and notation of the prescribed ragas (gats) Ragas; Kalyan, Khamaj, Bihag, Bhupali, Allihiya, Bilawal.
4. Talas : Jhaptal, Teen Tal, Dadra.
5. Elementary Knowledge of the following ragas : Sudh Kalyan Tilang, Deshkar.

Unit-III

1. Introduction and classification of different Musical Instruments used in Gurmat Sangeet.
2. Contribution of Guru Arjan Dev Ji towards Indian Music.

Music (Instrumental)

Paper-B

Practical

Time : 20 Minutes **Max.Marks : 100**

Practical **Marks : 20**

Internal Assessment based on the ComputerTotal Marks : 120

(1) One drut gat with short alaps, toras and jhalas in each of the following raga: Kafi, Kalyan, Bihag, Bhupali.

(2) One Vilambit gat with simple alap, toras in any of the prescribed ragas of the course.

(3) Ability to demonstrate Jhaptal, Teen Tal, Dadra Chautal by hands in Ekgun and Dugun.

(4) Ability to play Teen Tal, Dadra Tal on Tabla.

(5) Ability to play Ten Alankars on your instruments with different bols of mizrab.

(6) Dhun in any Raga.

(7) Non Detail Ragas:- Deshkar, Bhimplasi & Sudh Kalyan.

Books Recommended

1. Rag Parichaya Parts, I, II, III H.C. Srivastava. Sangeet Sadan Parkashan Allahabad. 2006
2. Sangeet Vishard, Sangeet Karyalaya, Hathras (U.P.) 2004
3. Hamare Sangeet, Rattan Sangeet Karyalaya, Hathras. 1978
4. Gurmat Sangeet (Vishesh Ank), Sangeet Karyalaya, Hathras Amrit Kirtan Trust, 422-A, Chandigarh. 1997
5. Gurmat Sangeet Prabandh Ate Parsar, Dr. Gurnam Singh, Published by Punjabi University, Patiala. 2000

Internal Assessment based on the Computer

* It will be Based on computer aided Programme in the form of presentation relating to any field of music. (Approx. 3 to 5 pages) using computers MS-Office, which will be evaluated by the external examiner at the time of examination Separate mark sheet should be used for Internal Assessment based on the Computer.

Music (Vocal)

Paper-A Theory : 3 Hours Durations Max. Marks : 80
Paper-B Practical 100 Marks
Internal Assessment based on the Computer 20 Marks
Total Marks : 200

Teaching work load:

Theory : 3 Periods per week
Practical: 9 periods per week

Note : There should not be more than twelve students in one group of practical class.

Instructions given to the examiners are as under:-

1. There should not be more than Ten students in a batch for practical examination.
2. Harmonium will be allowed as accompaniment in Vocal Music.
3. While sending the syllabus to paper setter in theory the syllabus prescribed for the practical paper should also be sent.
4. Separate practical paper should be set for each class from practical Paper-B prescribed syllabus.
5. The paper setter will set nine questions in all. Three in unit-I, four in unit-II & two unit-III. The candidates may be asked to attempt five question in all selecting at least, one question from each part.
6. The practical paper will be of the 100 marks for the private & regular candidates 20 marks for Internal Assessment based on the Computer in the form of presentation relating to any field of music (approx. 3 to 5 pages) using computers. (MS-Office) which will be evaluated by the external examiner at the time of examination. Separate mark sheet should be used for **I**nternal Assessment based on the Computer.
7. Candidate can take both subjects i.e.Vocal & Instrumental Music as elective subject.
8. Candidate can take Tabla subject along with vocal music.

Music (Vocal)

Paper-A (Theory)

Time : 3 Hours **Max. Marks : 80**

Unit-I

1. Importance of Globalization on Indian Music in Modern Period.

2. Method of formation of 72 Thatas of Dakhani Music system of Pandit Vyankat-Makhi.
3. Importance of Sahayak Nad.

Unit-II

1. Nibandh & Anibadh gan
2. Time theory in Indian Music sceintific & unscientific.
3. Biographical Sketches and Contributions of the following:-
   (i) V.N. Bhartkhande
   (ii) Dalip Chander Bedi
   (iii) Pt. Jasraj
   (iv) Ustad Amir Khan
4. Detailed description and notation of prescribed Ragas:-
   i) Kalyan ii) Kafi iii) Bhairav iv) Desh
5. Talas: Teental, Ektal, Jhaptal
6. Elementary Knowledge of following Ragas:- Asa, Tilang, in sorath.

Unit-III

1. Contribution of Shri Guru Nanak Dev Ji towards Indian Music.
2. Definition and explanation of the following terms in the context of Gurmat Sangeet: Raga, Mohalla, Rahao, Ank Rababi, Astpadi, Pada, Jatti, Kirtaniya.

Music Vocal

Paper-B

(Practical)

Time : 20 Minutes **Practical Max.Marks : 100**

Internal Assessment based on the Computer Marks : 20

Total Marks : 120

1. One Drut khayal in each of the following Ragas with simple alaps and tanas: Kalyan, Kafi, Bhairav, Desh.
2. One Vilambit Khayal in any one of the ragas prescribed in the course with simple alaps and tanas.
3. One Shabad in Nirdharit Raga.
4. Ability to play five Alankars on the harmonium based of the Thatas of prescribed Ragas in the course.
5. Ability of play, Teental, Dadra on Tabla.
6. Ability to play, Ektal, Teental Japtal by hand in Ekgun, Dhugan, Lalykarries.
7. Introduction of the following Ragas:- Asa, Sorath, Tilang and Kalingra.

Books Recommended

1. Rag Parichaya, Parts I, II, III. H.C. Srivastava. Sangeet Sadan Parkashan Allahabad, 2006.
2. Sangeet Vishard, Sangeet Karyalaya, Hathras (U.P.) 2004
3. Hamare Sangeet Rattan, Sangeet Karyalaya, Hathras. 1978.
4. Gurmat Sangeet (Vishesh Ank) Sangeet Karyalaya, Hathras (U.P.) 1997.
5. Gurmat Sangeet Parbandh Ate Parsar Dr. Gurnam Singh, Published by Punjabi University, Patiala, 2000.

Internal Assessment based on the Computer

* **It will be based on Computer Aided Programme** in the form of presentation relating to any field of music. (Approx. 3 to 5 pages) using computers. (MS-Office) which will be evaluated by the external examiner at the time of examination. Separate mark

sheet should be used for Internal Assessment based on the Computer.

Indian Classical Dance

Paper-A Theory : 3 Hours Duration Max.Marks : 80
Paper-B Practical : 20 minutes 100 Marks
Internal Assessment based on the Computer 20 Marks
Total : 200 Marks

Teaching work load :
Theory 3 periods per week.
Practical - 9 period per week.

Note: There should not be more than ten students in a group of practical class.

Instructions given to the examiners are as under :-

1. There should not be more than ten students in one batch for practical examinations.
2. Harmonium will be allowed as accompaniment to perform Nagma.
3. While sending the syllabus to paper setter in theory the syllabus prescribed for the practical paper should also be sent.
4. Separate practical paper should be set for each class from practical paper-B of prescribed syllabus.
5. The paper-setter will set nine questions in all. Three in unit-I, four in unit-II & two in unit-III. The candidate may be asked to attempt five questions in all selecting at least, one question from each part.
6. The practical paper will be of the 100 marks for the private & regular candidates. 20 marks for the Internal Assessment based on the Computer in the form of presentation relating to any filed of music & dance (approx. 3 to 5 pages) using computers. (MS-Office) which will be evaluated by the external examiner at the time of examination. Separate marks should ne used for Internal Assessment based on the Computer.

Indian Classical Dance

Paper A :- (Theory)

Time : 3 Hours **Max.Marks : 80**

Section-I

1. Definition of the following :-Kavit, Paran, Chakardar Paran, Tora, Kasak, Masak, Vandana, Gat, Laya, Thaat, Theka, Tatkar, Amad & Tehai.
2. Knowledge of :
   (a) Four neck movements
   (b) Eight eye glances.
   (c) Seven eye-brow movements.
   (d) Nine head movements.
3. Study of Asmyukta Mudras based on Abhinaya Darpan.
4. Study of Rasa and their importance in Kathak Dance.

Section-II

1. Survey and essential characteristics of Bharat-Natyam and Manipuri Dance.
2. Origin and development of Kathak Dance from Ancient to Mughal period.
3. Historical background of the Folk Dances of Punjab.
4. Abhinaya and various kinds.
5. Essay on :
   (i) Importance of Tal and Lehra in Kathak Dance.
   (ii) Advantages of Dance.

Section-III

1. Writing notation of the following :
   i) Teen Taal with its :
      (a) Tatkar in Thaah, Dugan and Chaugun Layakaries.
      (b) Thaat -2
      (c) Tehai -1
      (d) Amad -1
      (e) Salami -1
      (f) Tora -2
      (g) Paran -1
      (h) Chakardar Paran -1

(i) Kavit -1

ii. Jhaptal

a) Tatkar with its Thaah, Dugan, Tigun and Chaugun Layakaries -1

(b) Thaat -1

(c) Tehai -1

(d) Amad -1

(e) Tora -1

(f) Paran -1

(g) Chakardar Paran -1

2. Description of following talas with their Thaah, Dugun, Tigun and Chaugun Layakaries of Thekas.

(i) Teentaal

(ii) Jhaptal

(iii) Tilwara

iv) Ektal

3. (a) Comparative study of following taals :

Taal-Tilwara

Jhaptal-Sooltaal.

(b) Recognition of the following taals through some bols given by the examiner :

(a) Teentaal

(b) Jhaptaal

(c) Tilwara

(d) Dadra

(e) Kehrva

(f) Sooltaal.

(c) Notation of Nagma in Teen Taal and Jhap Taal.

Indian Classical Dance

Paper-B (Practical)

Time : 20 Minutes Practical Max. Marks : 100

Internal Assessment based on the Computer 20

Marks
Total : 120 Marks

Practical demonstration of the following :

1. Teen Taal its :

(a) Tatkar in Thaah, Dugan, Tigun and Chaugun Layakaries.
(b) Thaat - 2
(c) Tehai - 1
(d) Amad - 1
(e) Salami - 1
(f) Tora - 2
(g) Paran - 1
(h) Chakardar Paran - 1
(i) Kavit - 1

2. Jhaptal :

(a) Tathar with its Thaah, Dugan, Tigun and Chaugun Layakaries.
(b) Thaat - 1
(c) Tehai - 1
(d) Amad - 1
(e) Tora - 1
(f) Paran - 1
(g) Chakardar Paran - 1

3. Padhant of whole material by hand in all taals mentioned above.
4. Recognition of the compositions such as Tehai, Layakaries etc. composed by the Examiner.
5. Practice of (Hand movements with Tal).
6. (i) Two Gat Nikas in Taal.

(ii) One Bhajan

7. Ability to demonstrate :

   Panjabi or Rajasthani Folk Dance

8. Ability to play Nagma on Harmonium in Teen Taal & Jhaptaal.

Books Recommended

1.	Kathak Nritya Ka Prichey	Subhashni Kapoor Radha Publications, New Delhi. 1997
2.	Kathak Sundaryatmak Shashtriya Nritya	Shikhakharey Krishka Publishers. New Delhi. 2005
3.	Atihasik Pripeksh Mein Kathak Naritya	Maya Tak Knishka Publishers. New Delhi, 2006
4.	Nibandh Sangeeet	Laxmi Naryan Garg Sangeet Karyalya Hathras. 2004.

Internal Assessment based on the Computer

*** Based on Computer aided Programme** in the form of presentation relating to any field of music. (Approx. 3 to 5 pages) using compters. (MS-Office) which will be evaluated by the external examiner at the time of examination. Separate mark sheet should be used for Internal Assessment based on the Computer.

Tabla

Paper-A Theory : 3 Hours Durations Max.Marks : 80
Paper-B Practical : 100 Marks
Internal Assessment based on the Computer 20 Marks

Total Marks 200 Marks

Teaching work load :
Theory : 3 periods per week
Practical -9 periods per week

Note : There should not be more than ten students in one group of practical class.

Instructions given to the examiners are as under :

1. There should not be more than ten students in a batch for practical examinations.
2. Harmonium will be allowed as accompaniment to perform the Nagma.
3. While sending the syllabus to paper setter in theory the syllabus prescribed for practical paper should also be sent.
4. Separate practical paper should be set for each class from practical paper-B prescribed syllabus.
5. The paper-setter will set nine questions in all. (There questions in each unit) The candidate may be asked to attempt five questions in all selecting at least, one question from each part.
6. The practical paper will be of the 100 marks for the private & regular candidates. 20 marks for the Internal Assessment based on the Computer in the form of presentation relating to any field of music approx. 3 to 5 pages) using computers. (MS-Office) which will be evaluted by the external examiner at the time of examination. Separate mark sheet be used for Internal Assessment based on the Computer.
7. Candidate can take Tabla subject with Vocal & Instrumental music (Sitar, Sarangi, Veena, Sarood, Dilruba, Violin, Guitar, Bansuri, Shahnai, Rabab, Saranda, Taus, Santoor and any other Swar Vadhya to the played on the basis of Indian Classical Music).

Tabla

Paper-A (Theory)

Time : 3 Hours **Max. Marks : 80**

Section-I

1. Definitions with full explanations of Dayan, Bayan, Kinds of Laya, Avartan, Sum, Taali, Vibhag, Mukhra, Qayada, Rella, Paran, Tihai, Laggi, Tipali, Gat, Kayada.
2. Ten parans of talas.
3. Importance of tala in Music and Dance.

Section-II

1. Knowledge of Tabla, Dholak, Pakhawaj, Mridang, Khol.
2. Life sketch of the following :-

   Alla Rakha Khan,

   Habbiudin Khan,

   Zakir Husain Khan.
3. A short history of Tabla and its parts.
4. Comparative study of the following Taals :-

   Teentaal, Tilwara, Ektaal, Chautal, Tivra and Rupak.
5. The Place of Tabla in Light Music

Section-III

1. Notation and description of the following :-
   (i) Trital (Pashkara, Four Paltas, two quadas, two mukhras, Two Porans, Mohras.
   (ii) Ektal-(One Quayada, two tukra & Tehai)
   (iii) Dhammar-Pashkar Quadas, Tukra, Tihai
2. Notations of above mentioned taals with Dugun & Chaugun laykaries
3. Ability to prepare small Tihai and paltas based on the bols set by the examiner.

Tabla

Paper-B (Practical)

Time : 20 Minutes Practical Max. Marks : 100

Internal Assessment based on the Computer Marks : 20

Total Marks : 120

1. Tals Prescribed : Dadra, Kaharva, Trital, Chautal and Ektal.
2. Laggis in Dadra and Kaharva.
3. Trital Peshkara-Four Paltas Two quadas, Two Mukhras, Two Mohras Two Parans.
4. Ektal - One quada, Two Tukra, Two tehai, One paran.
5. Chutal theka in Ekgun, Digun and Chugan Layakaries.
6. Practice of playing the above taals with Vocal and Instrumental performance.
7. Practice of Dholak playing in Kaharva Tal.
8. Ability to play Nagma on harmonium in Tall :- Dadra, and Ektaal.
9. Tuning of Tabla.

Books Recommended

1. Sangeet Visharad : Basant, Sangeet Karyalaya Hathras. 2004
2. Tal Prabandh : Pt. Chhote Lal Misher Knishka Publisher, New Delhi. 2006
3. Bharti Sangeet Vadhya : Lal Muni Misher, Bhartiya Gayan Peeth Parkashan. 1973
4. Hamare Sangeet Rattan : Sangeet Karyalaya Hathras 1978
5. Tal Martand : Sataya Narayan Vishesht Sangeet Karyalaya Hathras 1994.

Internal Assessment based on the Computer

* It will be based on computer aided programme in the form of presentation relating to any field of Music. (Approx. 3 to 5 pages) using computers. (MS-Office) which will be evaluated by the external examiner at the time of examination. Separate mark sheet should be used for Internal Assessment based on the Computer.

Fine Arts
(Drawing & Painting)

Instructions for paper setters :

Paper-A : Theory 60 marks

Paper-B : Practical	Still Life	40 marks
Paper-C	Design	40 marks
Paper-D	Head Study	40 marks
Internal Assessment : for three Practical/Sessional Works		20 marks
		Grand Total : 200 marks

Outlines of Test

Note : (a) 60 marks for the theory paper and 40 marks per practical papers and 20 marks for internal assessment on the basis of session work submitted by the student shall be assessed by the teacher concerned.

(b) The question paper will cover the entire syllabus.

(c) Questions should be based on world famous paintings and sculptures whose slides are easily available.

(d) Question paper should cover the syllabus uniformly.

(e) The paper setter should set the paper in three sections, Section A, B and C.

(f) The division of the marks will be as under :-

Section A—20 marks for 10 short answer questions. Each question carries 2 marks.

Section B—20 marks 4 questions. The examiner will be set 6 question; the candidate will attempt 4 questions of 5 marks each.

Section C—20 marks for essay type questions. The examiner will set 4 questions; the candidates will attempt 2 questions of 10 marks each. Compartment candidates in the subject of Fine Arts will appear only in theory Paper during the supplementary examinations. Previous Marks of Practical paper will be considered for the aggregate.

Fine Arts

Paper-A (Theory)

Time : 3 Hours.

History of Indian Sculpture and Painting
(From the earliest times to C. 500 A.D.)
Part-A

1. Indus Valley
2. Mauryan :
    1. Lion Capital at Sarnath
    2. Bull Capital at Rampurva
    3. Didarganj Yakshi
    4. Yaksha from Parkham
3. Bharhut Stupa under Shungas :
   Sanchi Stupa under The Early Satavahanas
4. The Kushans :
    * Gandhara Phase
    * Mathura Phase

Part-B

1. Pre-historic paintings :
    * Bhim Batika cave
    * Hoshangabad and Panchmarhi.
2. Ajanta Paintings :
    * Padampani Bodhisattva
    * The Mother and Child before Buddha
    * Chhadanta Jataka
    * Dying Princess
    * Dream of Maya
    * Mar Vijaya
    * Hansa Jataka
3. Canons of Indian Painting (Shandangas)
4. Elements of Art
5. Principals of Art

Suggested Readings

Part-A

Rowland, Benjamin,	The Art and Architecture of India.
Saraswati, S.K.,	A Survey of Indian Sculpture.
Zimmer, Heinrich,	The Art of Indian Asia, Vol. 02.
Chawla, S.S.,	'Bhartya Murtikala' Punjab State University Text Book
Stella Kramrisch,	Indian Sculptures Publisher - Thames and Hudson, London, 1997.
Roy C Craven Thomas & Hudson	Indian Art, A Concise History
Vasudeva S. Agrawala	The Heritage of Indian Art. Publications Division, Ministry of Information and Broad casting Govt. of India. Printed by Pyarelal Sah at the times of India Press Bombay, India.

Part-B

Rawson, Philip	Indian Painting
Barrett, D and Grey	Painting of India
B. Majumdar, R.C.	Bhartya Vidya Bhawan Series, The History and Culture of Indian People, Vol-II, Sculpture and Painting section only.
Percy Brown	Indian Painting
Tagore, R.N.	Six Limbs of Indian Painting
Read Herbert	Meaning of Art
Nihar Ranjan Roy	Appreciation of Art
L.C. Sharma	Brief History of Indian Painting, Publisher-Krishana Goel House, Meerut (U.P.)

Fine Arts

Paper-B

Still Life Study
Practicals

Time : 5 Hours **Max. Marks : 40**

Objects to Study - Proportion, Volume, Texture, Study of light and shade and rhythmic relationship of masses.

Number of objects - Three objects excluding drapery

Medium - Oil, Water and Pastel colours.

Size ½ Imperial

Six selected works will be submitted. Out of six, three monochromic and three coloured works are required to be submitted.

Paper-C DESIGN

Time : 5 Hours **Max. Marks : 40**

Design should be based on natural, decorative and geometrical motifs.

Corner, allover and border designs should be submitted.

Medium - Poster Colors/ Fabric Colors

Size - 1/2 Imperial

4 Selected works in Poster Colors on paper and 2 works in Fabric Colors on cloth measuring 1/2 Imperial will be submitted.

Paper-D HEAD STUDY

Time : 5 Hours **Max. Marks : 40**

Rendering of Human Head from life/caste. Emphasis should be given on structure, volume, proportion, light, shade and texture.

Medium - Charcoal or pencil.

Size - ½ Imperial

Five selected Works will be assessed by the teacher concerned.

50 sketches of the size ¼th imperial based on paper B,C & D in any medium wiil be submitted

History of Art

Paper - A

Time : 3 Hours. **Max. Marks : 100**

Outlines of Test, Syllabi and Courses of Reading

Note: (a) The question paper should cover entire syllabus. It may contain very specific short answer questions.

(b) The paper-setter should set 30 questions in all. Students will attempt 20 questions.

(c) The questions can be repeated from the previous question paper.

Part-I

History of Indian Mural Painting from earliest time to C 9th Century A.D.

Pre-historic painting : the cave shelters of Central India; Ajanta, Bagh, Badami, Sittanavasal and Ellora.

Part-II

History of Indian sculpture from the earliest times to 3rd century A.D. Indus Valley; Mauryas; Bharhut; Sanchi; Amaravati; Nagar Junikonda; Mathura under the Kushana, Gandhara.

History of Art

Paper-B

Time : 3 Hours. **Max. Marks : 100**

Note: (a) The question paper should cover entire syllabus. It may contain very specific short answer questions.

(b) The paper-setter should set 30 questions in all. Students will attempt 20 questions.

(c) The questions can be repeated from the previous question paper.

Part-I

History of European Painting & Sculpture from the earliest times to C. 1300 A.D. Egypt; Greek; Rome, Art of Early Christian period and Gothic Period.

Part-II

Theory and Principles of Art appreciation, Explanation through illustrations, the concepts of space, line, colour, form, texture, light and shade design, balance, harmony, composition, perspective; foreshortening, Mural technique : Fresco & Tempera.

Commercial Art

Paper I : Theory : Art Appreciation and Advertising **40 Marks**

Paper II : Lettering **50 Marks**

Paper III : Labels **40 Marks**

Paper IV : Illustration (Story based and object drawing) **50 Marks**

Internal Assessment for Regular Students **20 Marks**

Total : 200 Marks

Students will have to complete five works of each subject for internal assessment.

Paper-I (Theory)

Time : 3 Hours. **Max. Marks : 40**

Note : Paper-setter will set ten questions in all. A candidate will attempt five questions. Two questions from each part will be compulsory.

Part-A

Elements of colours primary colours, secondary colours tertiary tint. Tore in colours. Give the detail and significance of each colour. What is Commercial Art ?

Part-B

Definitions :-Principles of Commercial Art. Poster and its qualities, layout and its types, Role of Commercial Art in Modern age. Display of art object in exhibition.

Paper-II

Lettering

Time : 5 Hrs. **Max. Marks : 50**

Size ¼ imperial

Medium : Ink

Block Letter, Condensed letters, Free hand Letter.

Paper-III

Time : 5 Hours **Max. Marks : 40**

Labels/Monograms, Logo Letter Heads

Maximum Colours : 4

Medium : Poster colours

Size : Greeting Card Size 5"x7", for others as required. Simple and creative approach will be appreciated.

Paper-IV

Illustration (Sketching)

Practical

Time : 5 Hours **Max. Marks : 50**

Size : 1/4 imperial

Still life, Nature Study and Story based illustration.

Medium : Pencil Charcoal Ink and Water Colours.

Add : Life Sketches/Portraits, Nature Study

Internal Assessment : 20 Marks

Note : Internal Assessment will be assessed by the teacher concerned and shall be submitted to the University through the Principal of the College.

Sculptures

Outlines of Tests

Paper-I	**Theory**	**Time : 3 Hours**	**60 Marks**
Paper-II	**Practical**	**Time : 10 Hours**	**60 Marks**
Paper-III	**Practical**	**Time : 8 Hours**	**60 Marks**
Internal Assessment			**20 Marks**
			Total : 200 Marks

Syllabus and Courses of Reading

Paper-I (Theory)

Time : 3 Hours **Max. Marks : 60**

Note : (1) The question paper should cover the entire syllabus. It may contain very specific short-answer questions.

(2) The paper-setter should set 30 questions in all and students will have to attempt 20 questions in all.

(3) The question can be repeated from the previous quesion paper.

Part-A

Appreciation of Sculpture

What is Sculpture, Canons of Indian Art (Shadanga) Bhangas. Detailed description Form, composition, proportion, texture.

Appreciation of some selected works of Artists (only with reference to sculpture) :

The Triumph of labour	D.P. Choudhary
Santal Family	Ramkinkar Baij
Skating the Stag	Chintamoni Kar
Volume in three Masses	Prodosh Das Gupta
Standing Figure	Sankho Choudhary
Flute Player	Dhanraj Bhagat.

Part-B

Method of Material

How to prepare clay, process of Terracotta, Plaster Casting, Method of modelling in clay, Importance of armature, Colouring of sculpture, Importance of Pedestal. Meanings of Relief, Round of three dimensional sculpture, totso, bust (Portrait), figure, plasticity, contours.

Paper-II (Practical)

Time : 10 Hours **Max. Marks : 60**

(in two days)

Note : Student will submit two portraits done in the class as a sessional work.

Size : Life Size. (10 Marks)

Portrait study from life in clay.

Paper-III (Practical)

Time : 8 Hours **Max. Marks : 60**

(in two sessions)

Creative Composition based on human figures and forms in Nature. Every student will submit three compositions done in the class as a sessional work.

Size : Not less than 45 Cms.

Note :

a) Internal assessment will be assessed by the teacher concerned and will be submitted to the University through the Principal of the college.

b) In the case of private candidates there will be no internal assessment and the marks obtained in the practical examinations shall be proportionately increased.

Dramatic Art

Theatre Art

Time : 3 Hours

Paper-A : Theory **80 Marks**

Paper-B : Practical **100 Marks**

Int. Ass. for regular students **20 Marks**

Total : 200 Marks

Teaching load work Theory : 3 Periods per week

Practical : 9 Periods per week

Instructions given to the examiners are as under :-

1. There should not be more than 10 students in a batch for practical examination
2. Separate practical paper should be set for each class from practical paper B prescribed syllabus.
3. Paper setter will set ten questions and the candidate may be asked to attempt five questions. 10 should be based on play production. While selecting the compulsory question, the paper setter will ensure adequate choice to the students.

Dramatic Art

Sr. No.	Subject	Max. Marks	Theory	Practical	Duration of Exam.
1.	Theatre Art	200	100	100	3 Hrs.
	Internal Assessment	-		20	
	External Assessment		100	80	

Paper-A
Theory

Marks : 100

1. Introduction to Indian Theatre
2. Introduction to Folk Theatre forms of India
3. Basics of Natyashastra
4. Principles of play productions
5. Introduction of Greek and Elizabethan Theatre

Paper-B
Practical

Marks : 100

1. Glossary of Stage Terms -Prosceinium, Apron, Tormentor, Teaser, Sighteines, Cyclorama, Pivot point, Pivrole, Flies, Curtain etc.
2. Simple exercises in Yoga
3. Rhythmic movements and improvisation
4. Enactment of simple roles.
5. Exercises in Mime
6. Production of small skits.
7. Theatre Managements.
8. Introduction to Set Design – Simple sketches
9. Introduction to Make-up
10. Introduction to Stage lighting

Human Genetics
Scheme of Courses

Paper-I

Introduction to Human Genetics	75	-	75	60
Human Anatomy, Physiology and Embryology	75	-	75	60
Fundamentals of Human Anatomy, Physiology and Genetics (Practical)	-	50	50	100
Total	**150**	**50**	**200**	-

Human Genetics

Paper-I

Introduction to Human Genetics

Time : 3 Hours **Max. Marks : 75**

Total Hours : 60

Instructions for Paper-Setters

1. The Question Paper should be set strictly according to the syllabus.
2. A total of nine questions should be set.
3. The candidates will be required to attempt five questions in all.
4. **Section-A :** It should comprise one question to be compulsorily attempted and cover the entire syllabus. There should be ten parts, each part carrying one and half marks, the toal weightage being 15 marks. Each part is to be attempted in 50 words (1½ pages).
5. **Section-B :** The other eight questions should be so designed that two questions are set from each unit. The candidates are required to attempt four questions i.e. one question from each unit. Each question will be divided into two parts and each part will carry 7.5 marks and should be attempted in 500 words (3 pages), total weightage being 60 marks. These questions can be subdivided into parts at the discretion of the examiner.

Unit-I

Definition of growth, Laws of growth and development, Assessment of growth, Growth curves, Factors affecting growth, Classification of physique by external body form-Viola, Kretschmer, Sheldon and Health-Carter system in brief, Methods of studying body composition.

Unit-II

Mendel's principles, Modes of inheritance, Gene interaction-Epistasis, Modifying, Lethal genes, Codominance with reference to

ABO, MN system, Segregation ratios, Phenocopy, Concordance and Disconcordance, Cytoplasmic inheritance, Sex chromatin, Sex linkage, Basic concepts of linkage, Recombination and gene mapping.

Unit-III

Blood group substances (ABO and secretor factor), Amino acid substitutions with reference to haemoglobin variants, Garrod's inborn errors of metabolism (Alkaptonuria, Pheynylkeptonuria, Galactossemia, G6PD deficiency and β-thalassemia).

Hardy-Weinberg law, Factors affecting it and its applications, Basic concepts of genetic polymorphism.

Unit-IV

Chromosome structure, Molecular organization, Variation in number and structure. Cell division-Mitosis, Meiosis, Difference in male and female meiosis.

Somatic cell hybridization, Introduction to prenatal diagnosis, Forensic analysis from blood group markers, Paternity exclusion, DNA fingerprinting, Pedigree analysis.

Books Recommended

Brown, T.A. (1992). Genetics : A Molecular Approach. Van Nostrand Reinhold Co., Amesterdam.

Cummings, M.R. (2005). Human Heredity : Principles and Issues. Brooks/Coe Pub. Co.

Gardner, E.J., Simmons, M.J. and Snustad, D.P. (2004). Principles of Genetics. John Wiley and Sons, Inc., New York.

Ghai, O.P., Gupta, P. and Paul, V.K. (2005). Essential Pediatrics. CBS Publishers and Distributors, New Delhi.

Griffiths, A.J.F., Wessler, S., Lewontin, R. and Carrol, S. (2006). Introduction to Genetic Analysis. W.H. Freeman and Co.

Harris, H. (1990). The Principles of Human Biochemical Genetics. Elsevier-North Holland, New York.

Illingworth, R.S. (1987). The Development of the Infant and Young Child. Churchill Livingstone, New York.

Lewis, R. (2007). Human Genetics. W.C.B. Publishers, England.

Mange, E.J. and Mange, A.P. (1994). Basic Human Genetics.

Sinaur Associates, Inc., Massachusetts.

Ulijaszek S.J., Johnson and Preece, M.A. (1998). Human Growth and Development; The Cambridge Encyclopedia. Cambridge University Press.

Human Genetics

Paper-II

Human Anatomy, Physiology and Embryology

Time : 3 Hours **Max. Marks : 75**

Total Hours : 60

Instructions for Paper-Setters

1. The Question Paper should be set strictly according to the syllabus.
2. A total of nine questions should be set.
3. The candidates will be required to attempt five questions in all.
4. **Section A :** It should comprise one question to be compulsorily attempted and cover the entire syllabus. There should be ten parts, each part carrying one and half marks, the toal weightage being 15 marks. Each parts is to be attempted in 50 words (1½ pages).
5. **Section-B :** The other eight questions should be so designed that two questions are set from each unit. The candidates are required to attempt four questions i.e. one question from each unit. Each question will be divided into two parts and each part will carry 7.5 marks and should be attempted in 500 words (3 pages), total weightage being 60 marks. These questions can be subdivided into parts at the discretion of the examiner.

Unit-I

Anatomical positions - Superior, inferior, anterior, posterior, medial, lateral, proximal, distal, external, internal, parietal, visceral, cavities and planes of human body.

Skeletal system - Type of bones, histology, ossification, growth, repair of bone, types of joints, and types of movements at joints.

Muscular system-Structure of cardiac, skeletal, smooth muscle, neuromuscular junction and physiology of muscular

contraction.

Digestive system - Gross anatomy constituent parts, physiology of digestion and absorption, taste receptors and gustatory pathway.

Unit-II

Heart and circulatory system - Structure of heart, cardiac cycle, relation of cardiac output and blood pressure, types of blood vessels, overview of arterial and venous blood supply.

Respiratory system - Gross anatomy constituent parts, pulmonary ventilation, external and internal respiration, role of hemoglobin in oxygen and carbon dioxide transport, regulation of respiration, olfactory receptors and olfactory pathway.

Lymphatic system - Overview of system and functions.

Unit-III

Nervous system - Gross anatomy spinal cord, brain, anatomic nervous system, reflex action, ascending and descending tracts, functions of brain, spinal cord, autonomic nervous system.

Special senses - Structure and function of eye, ear, touch receptor.

Endocrine gland - Brief description of structure and function of Pineal, Pituitary, Thyroid, Parathyroid, Adrenal, Pancreas.

Unit-IV

Urinary system - Anatomy of urinary system, structure of nephron and function of kidney in urine formation and maintaining acid-base balance.

Reproductive system - Anatomy of male and female reproductive system, Hormonal control of male and female reproductive physiology.

Embryology - Fertilization, conception, development of embryo till somite formation and fate of three germ layers.

Books Recommended

Guyton, A.C. and Hall J.E. (2004) Textbook of Medical Physiology.

W.B. Saunders Co., USA.
Singh, I.B. (2000). Human Embryology, Macmillan Co., New Delhi.
Tortora, G.J. and Grabowski, S.R. (2004). Principles of Anatomy and Physiology. Harper Collins College Publisher, USA.
Waugh, A.R. and Grant A.W. (2006). Human Anatomy and Physiology in Health and illness. Churchill Livingstone, USA.

Fundamentals of Human Anatomy, Physiology and Genetics (Practical)

Time : 3 Hours **Max. Marks : 50**

Skull - different views, Vertebrae, Sternum, Scapula, Bones of upper and lower limbs, Innominate, Clavicle, Sex differentiation in skull, innominate, sacrum, Slides of embryological stages. Estimation of Hb, BT, CT, TLC, Blood pressure and pulse rate. Numericals based on Mendelian and Hardy-Weinberg principles. Human morphogenetic traits, Barr body analysis in buccal smear.

Scheme of Examination for Clinical Nutrition

and Dietetics (Vocational)

	Paper	No. of Theory	Duration	Marks	Practical No. of Papers	Duration	Marks	G. Total
1.	**Paper-A**							
	Food Microbiology	1	3 Hours.	50	-	-	-	50
2.	**Paper-B**							
	Basic Nutrition & Meal Management	1	3 Hours.	50	1	3 Hours.	25	75
3.	**Paper-C**							
	Nutrition Biochemistry	1	3 Hours.	50	1	2 Hours.	25	75
							Total :	**200**

Scheme of Studies for Clinical Nutrition and Dietetics (Vocational)

Paper	Theory (Periods)	Practical
1 **Paper – A** Food Microbiology	2	-
2 **Paper – B** Basic Nutrition Meal Management	4	6 Periods/ Group/Week
3 **Paper – C** Nutritional Biochemistry	3	3 Groups

Note : According to latest syllabus there will be practical in Nutritional Biochemistry.

Clinical Nutrition and Dietetics (Vocational)

Paper-A

Food Microbiology (Theory)

Time: 3 Hours **Max. Marks: 50**

Instructions for the Paper Setters:-

Note : The question paper shall consist of three sections as follows:-

Section-A will consist of 8 questions. All questions are compulsory. Each question will carry 1½ marks. Answers upto 5 lines.

(Total 12 marks).

Section-B will consist of short answer type questions with answers to each question upto two pages in length. Eight questions will be set by the examiner and six will be attempted by the candidates. Each question will carry 4 marks (Total 24 marks).

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry 7 marks. (Total 14 marks).

Objectives :

To help the students to -

a) Acquire an elementary knowledge about micro-organisms.

b) Develop an understanding of the role of micro-organisms in environment, industry & in maintenance of health.

Course Outline

1. Introduction to microbiology & its relevance to everyday life, General morphology of micro-organisms-general characteristics of bacteria, fungi, virus, protozoa, algaes.
2. Control of micro-organisms-growth, curve-Effect of environmental factors on growth of micro-organisms-pH, water activity-oxygen 2 availability, temp. & others.
3. Microbiology of different foods- Spoilage and contamination-sources, types, effects on the following :
   a) Cereals & cereal products.
   b) Sugar & sugar products.
   c) Vegetables & fruits.
   d) Meat & meat Products.
   e) Fish & other sea foods.
   f) Eggs & poultry.
   g) Milk & milk products.
   h) Canned foods.
4. Environmental microbiology - water, air, soil & sewage. Other agents of contamination Humans, domestic animals vermins birds, Harmons, antibiotics, chemicals and metal contamination.
5. Microbial intoxications & Infections - sources of contamination of foods, toxin production and physiological action. Sources of infection of foods by pathogenic organisms - symptoms & methods of control.
6. Beneficial effect of micro-organisms.
7. Relevance of microbiological standards for food safety.

References:

1. Frazier, W.C., Food Microbiology, 4th ed. 2006, McGraw Hill, New York.
2. Kawata K., Environmental Sanitation in India, 1963. Lucknow Pub. House.
3. Pelczar M.J. and Rober D., Microbiology, 5th ed. 1990, McGraw Hill. New York.
4. Barwart G.T., Basic Food Microbiology, 2000 CBS Publ. New Delhi.
5. Jay, J.M., Modern Food Microbiology, CBS Pub. New Delhi. (2005).
6. Ray, Fundamentals of Food Microbiology, 4th Edition, 2006, CRC Pub (Routledge).
7. Blackburn, Food Spoilage Microorganism 3rd Edition, 2006, WoodHeal, New York.

Clinical Nutrition & Dietetics (Vocational)

Paper-B

Basic Nutrition and Meal Management

(Theory)

Part-I

Time: 3 Hours **Max.Marks : 50**

Practical Marks : 25

Instructions for the paper setters :-

Note : The question paper shall consist of three sections as follows:-

Section-A will consist of 8 questions. All questions are compulsory. Each question will carry 1½ marks. Answers upto 5 lines.(Total 12 marks).

Section-B will consist of short answer type questions with answers to each question upto two pages in length. Eight questions will be set by the examiner and six will be attempted by the candidates. Each question will carry 4 marks (Total 24 marks).

Section-C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry 7 marks. (Total 14 marks).

Objectives:

To enable the students to -

1. Understand the relationship between nutrition and human well being.
2. Know and understand the functions, importance of all nutrients for different age groups and special groups.

Course Outline

1. Introduction to nutrition - food as a source of nutrients, function of foods, definition of nutrition, nutrients, adequate, optimum and good nutrition, malnutrition.
2. Inter-relationship between nutrition and health-visible symptoms of good health.
3. Food guide - basic five food groups - how to use food guide.
4. Use of food in body-digestion, absorption transport, utilization

of nutrients in the body.

5. Water - as a nutrient function, sources requirement water balance - effect of deficiency.
6. Carbohydrates -composition, classification food sources, functions, storage in body.
7. Fat and oils - composition, saturated, unsaturated fatty acids, classification food sources, functions of fats.
8. Proteins - composition, sources, essential, non-essential amino acids, sources of proteins, functions, protein deficiency (very brief).
9. Energy - unit of energy, food as a source of energy, energy value of food. The body's need of energy B.M.R. activities, for utilization of food to fat energy requirement.
10. Acid - base balance.
11. Minerals - Functions, sources, Bio-availability, and deficiency of following minerals - calcium, iron, iodine, fluorine, sodium, potassium (in very brief)
12. Vitamins - classification, units of measurement, sources, functions and deficiency (very brief) about following vitamins:
    a) Fat soluble vitamins D vitamin A b) Vitamin D
    c) Vitamin E d) Vitamin K
    Water soluble vitamins:
    a) Ascorbic acid b) Thia Min
    c) Riboflalvin d) Niacin
    e) Other member of B-complex such as B-6, Folic acid and B-12. **Total - 37**

References :

1. Lehnunger A.L., Nelson. D. Cox MM, Principles of Biochemistry, 1993, 2nd Edition, CBS Publication.
2. Murray RK and Granner DK. Harper's illustrated Biochemistry International 26e, (McGraw Hill) Appleton & Lange publication Calefornia (2005).
3. Singh Sukhdev, Dr. Om Prakash, PV's Bio-chemistry and Clinical Pathology, 2005 Edition, S. Vikas & Co.

Meal Management (Theory)
Part-II

Objectives:

To enable the students to

a) Acquire knowledge of the principles of planning diets for various stages of life cycles.

b) Develop ability to plan balanced diets for various activity groups and for various socio-economic levels.

Course Outline

1. Introduction to meal management - Balanced diet-Food guide - Basic 5 food groups.
2. Basic principles of meal planning - objectives - steps in meal planning - Food cost.
3. Nutrition in Pregnancy - physiological stages of pregnancy.
4. Nutritional requirements - Food selection - Complications of pregnancy.
5. Nutrition during Lactation - physiology of lactation nutritional requirements.
6. Nutrition during Infancy - Growth & development nutritional requirements-Breast feeding-Infant formula Introduction of supplementary foods.
7. Nutrition during Early Childhood (Toddler/Preschool) Growth & nutrient needs - Nutrition related problems - Feeding pattern.
8. Nutrition of school children - Nutritional requirement - Importance of snacks - school, lunch.
9. Nutrition during Adolesscence Growth & nutrient needs food choices - Eating habits - factors influencing.
10. Geriatrics - Role of Diet.

References :

1. Text book of Nutrition and Dietetics, Kumud Khanna, K and Gupta S. (2005), Elite Publishing House Pvt. Ltd.
2. Nutritive Value of Indian Foods.
   Gopalen, C and Rama Shastri, B.V. et. al (2007). Nutritive value of Indian Foods. National Institute of Nutrition, Hyderabad, 2007.
3. Swaminathan, M. (2007), Essentials of food and Nutrition Vol I, II.

Meal Management (Practical)

Time : 3 Hours **Max. Marks : 25**

Course Description

The student will acquire the ability to plan & prepare meals for the various income levels & family members.

Objectives :

To enable the students to

1) Learn the principles of meal planning.
2) Plan & prepare meals for the family members at different income levels.
3) Plan meals for special groups - infants, pre-schoolars, adolescents, pregnant & nursing mothers & aged.

Course Outline

1. Basic principles of meal & menu planning keeping in mind different socio - economic groups, Planning of meals for middle income family, important considerations in planning meals.
2. Daily food guide - Basic five food groups, use of food groups, Food costing.
3 Planning for adultman & women during different physical - activities-sedantary, moderate, heavy worker. Preparation of above diet.
4. Planning & preparation of a balanced diet for a pregnant woman - Nutritional requirements modification of dietary pattern - complications during various stages of pregnancy.
5. Planning & preparation of a balanced diet for a nursing mother - modification of normal meal pattern – special foods given during lactation - nutritional requirements.
6. Nutrition during infancy - nutritional requirements during infancy - advantages of breast feeding-disadvantages of bottle feeding.
   Supplementary feeding - preparation of weaning foods.

7 . Planning & Preparation of diet for a toddler pre-school child - nutritional requirements- food pattern – acceptance.

8. Nutrition during school age - nutritional considerations, planning & preparation of meals/packed lunch.

9. Nutrition during adolescence - growth & development - nutritional requirments. Factors influencing food habits - preparation of meal.

10. Planning a diet for senior citizen - factors affecting food intake & nutrient use - special needs - nutritional requirements preparation of meals.

References

1. Recommended Dietary Intake for Indians, ICMR 2007.

2. Mudambi, S.R. & Rajagopal M.V. Fundamentals of Foods & Nutrition, 3rd ed. Willey Eastern Ltd., New Delhi.

Clinical Nutrition and Dietetics (Vocational)

Paper-C

Nutritional Biochemistry (Theory)

Time : 3 Hours **Max.Marks : 50**

Period=3 week

Instructions for the paper setters :-

Note : The question paper shall consist of three sections as follows:

Section A will consist of 8 questions. All questions are compulsory. Each question will carry 1½ marks. Answers upto 5 lines. (Total 12 marks).

Section B will consist of short answer type questions with answers to each question upto two pages in length. Eight questions will be set by the examiner and six will be attempted by the candidates. Each question will carry 4 marks (Total 24 marks).

Section C will consist of essay type questions with answers to each question upto 5 pages in length. Four questions will be set by the examiner and the candidates will be required to attempt two. Each questions will carry 7 marks. (Total 14 marks).

Objectives

The course is designed to give a sound base for the study of Nutrition and Dietetics and to help students to gain an understanding of the application of Bio-chemistry to Foods, Nutrition and Diet Therapy.

Course Outline

1. Molecular aspect of transport, passive diffusion, facilitated diffusion, active transport, nutrients and energy needs. Coupled reactions.
2. Biological oxidation Electron transport mechanism NADH, dehydrogenase, cytochroms, electron transport chain, oxidative phosphorylation, energy conservation, high energy phosphate bond, storage and release of high energy phosphate, myokinase reaction.

3.Genetic Control of Metabolism: Nucleic acids- Compirents. structure, replication, RNA - Compirents. types, structure, replication. Genetic repair mechanisms. Genetic Code - Protein bio-synthesis Viruses and recombinate DNA and bioengineering.

4. Major Metabolic pathways:
   a) Carbohydrate metabolism : Digestion, absorption. glucose transport, Glycolysis, metabolism of lactate and pyruvate, citric acid cycle, glucone ogenesis, pentose phosphate pathway.
   b) Lipid metabolism: Digestion, absorption, intestinal resynthesis of friglycerides, transport oxidation of fatty acids, biosynthesis of fatty acids, mobilisation of fat, ketogenesis,, metabolism of phospholipids, glycolipids and cholesterol (in brief).
   c) Amino acid metabolism : Digestion, absorption, transport, General pathways biochemical transformations and metabolism.

5. Hormones - pituitary, adrenocortical thyroid and reproductive hormones - Hormones of adrenal cortex. Mode of action. Prostaglandins Control of homeostasis.

6. a) Enzymes-definition, classification specificity of enzymes factors affecting enzyme activity.
   b) Energy Metabolism method of estimation. Total value, physiological value, gross value, Utilization of energy muscle shifted in lipids & carbohydrate utilization. Basal Metabolism-Method determination factors affecting Basal Metabolism, Specific Dynamic Action of food shifts.
   c) Metabolism of Inorganic elements calcium phosphorous, iron, magnesiums.
   d) Review of digestion absorption and Metabolism of Carbohydrate. Lipids, fats & fatty Acids. Energy yield

from dietary fat and carbohydrates.

e) Water and electrolyte balance.

7. (1) Review of digestion, absorption and metabolism of (a) Carbohydrates, (b) Lipids-Fats and fatty acids (c) Energy yield from dietary fats and Carbohydrates.

(2) Energy metabolism-utilization by muscle tissue, in lipids and carbohydrates, Utilization in relation to excercise type, intensity and duration.

(3) Water and electrolyte balance water and electrolyte losses and their-replenishment effect of dehydration.

References :

1. Elementary Biochemistry, Jain JL, S. Chand Malhotra V.K., New Delhi, 1993.
2. Biochemistry for students, Malhotra V.K., JayPee Bros. Delhi, 1989.
3. Biochemistry, Pawa, Bombay Holidays, 1989.

Clinical Nutrition & Dietetics (Vocational)

Paper-C

Biochemistry (Practical)

Time : 2 Hours. **Max. Marks : 25**

Periods =3 Week

1. Qualitative analysis of mono-saccharides, disaccharides and polysaccharides.
2. Qualitative estimation of Glucose
3. General reaction of fats and oil
4. Qualitative tests of amino acids, proteins
5. To test of protein fats and carbohydrates in milk, egg and wheat flour.
6. Determination of acid value and sponification value of fats and oils.
7. Quantitative estimation of Co.
8. Qualitative tests of normal and abnormal constituent of urine.
9. (a) To find out the adulteration in milk, by quantitative estimation of lactose in milk.
   (b) To find out the various adulteration of food stuffs.

Cosmetology (Elective)

Scheme of Study

Name of Paper	Periods/Week
1. Cosmetology (Theory)	6
2. Cosmetology (Practical)	6

Scheme of Examination

Name of Paper	No. of Paper	Time	Marks	Total
Cosmetology (Theory)	1	3 Hrs.	75	100
Project (Internal Assessment)				25
Practical	1	4 Hrs.	100	

Instructions for Theory Exam. :

Note : Question paper will consist of three sections as follows:

Section A : It will consist of 8 very short answer questions with answers to each question upto 5 lines. All questions will be compulsory. Each question will carry two marks total weightage will be 16 marks.

Section B : It will consist of short answer questions with answers upto two papers in length. Seven questions will be set by examiner & seven will be attempted by the candidate. Each question will carry 5 marks. The total weightage of the section will be 35 marks.

Section C : It will consist of essay type questions with answers upto 5 pages. Four questions will be set by the examiner & candidate will be required to attempt two. Each question will carry 12 marks. Total weightage being 24 marks.

Cosmetology (Elective)

Theory

Paper-A

Time : 3 Hours **Max. Marks : 75**

Periods per week : 6

I. **Cosmetology**

Introduction

a) Aims and Objectives

b) Importance

II. **Personal Grooming**

a) Care of yourself – Mouth, Teeth, Eyes, Ears, Feet, Removing Body hair, Skin care and cosmetics, Care of hair, Nail and Hand Care, Care of your clothing.

b) Visual Poise : Standing, walking, sitting

c) Wardrobe planning, illusion, clothing inventory, how to stay in fashion.

III. **Skin**

a) Structure of skin

b) Function of skin

c) Common skin Problems

IV. **Nails**

a) Structure of Nail

b) Disorders of the Nails

c) Diseases of Nail

V. **Nutrition**

1) Basic concept of proteins, carbohydrates, fats, vitamins, minerals.

2) Concept of balanced diet

VI. **Basic Knowledge Regarding**

a) Digestive system

b) Circulatory system

VII. **Role of Exercise and Yoga for Health**

Value of Yoga and Disciplines of Yoga

Internal Assessment based on the Computer

Max. Marks : 25

I. A comparative study in terms of cost and utility of various Skin products with special reference to—

a) Brand names available in market

b) Locally available products

c) Herbal products

The students are required to conduct a survey and submit a project report for assessment (to be assessed by 3 experts)

II. A consumer survey (sample size 20) to be conducted to assess the utility and effectiveness of Home-remedies e.g. Besan, oatmeal, curd etc.

Cosmetology (Practical)

Time : 4 Hours **Max. Marks : 100**

Period/Week : 6

I. Massage

a) Theory of Massage

b) Benefits of Massage

c) Methods of Massage

d) Massage Technique

II. Facial Massage - (at least five)

a) Skin Analysis and Skin Care Routines

b) Plain Facial

c) Skin Treatment - Packs and Masks

d) Preparation of 3 facial creams for differnt skin types

III. Nail and Hand Care

a) Manicuring

b) Special Manicure

c) Massage for Manicure

d) Nail Mending

e) Artificial Nails

f) Pedicure

IV. Yoga Asanas - Philosophy of Yoga

a) Yoga for Health

b) Importance of Yoga Practice

c) Guidelines for Yoga Practice

d) 1) Vrksasana

2) Utt-lita Trikor asana

3) Virabhadrasana

4) Radmasana
5) Janu Sirsasana
6) Pascimottanasana
7) Ardha Matsyendnasana
8) Bhujangasana
9) Dhanurasana
10) Ustrasana

Note : Each candidate has to cater to atleast 5 clients.

Recommended Books :

1. The Prentice Hall Text Book of Cosmetology by Olive Scoll, Marycalloharm Rose Paulkner, Margaret Jenkins Prentice Hall Englewoods Cliff, New Jersey 07632.
2. The Beauty Principal Victoria Principal Hmlyn.
3. Yoga — The lyengar way — By Silva, Mira & Shyam Mehta Dorling Kinder by London.

Home Science

Scheme of Studies

Sr. No.	*Subject*	*Theory*	*Practical*
1.	Family Resource Mgt.	3 hrs./week or 4 period/week	3 hrs/week
2.	Hygiene & Physiology	3 hrs./week or 4 period/week	

Scheme of Examination

Theory	*Name of Paper*	*No. of Paper*	*Time in hrs.*	*Marks Assessment*	*Int. Marks*	*Total*
1.	Family Resource Management	1	3	65	10	75
2.	Hygiene & Physiology	1	3	65	10	75
Practical						
1.	Home Mgt.	1	3	40	10	50
2.	Hygiene A & Physiology	—	—	—	—	—

Total of Theory & Practical : 200

Note : Internal Assessment should be based on assessment/term test/seminar attendance.

Home Science

Paper-A

Family Resource Management

Time : 3 Hours/week **Max. Marks : 75**

Theory : 65

Assess : 10

Instructions to the paper setters

The question paper will consist of five sections A,B,C,D & E. Section A,B,C,D will have two questions from the respective section of the syllabus & will carry 10 marks each. Section E will consist of 10 short type questions which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt one question each from the section A,B,C & D of the question paper and the entire section E.

Section-A

1. **Home :** Meaning and importance of Home Science
   a) Functions of Home
   b) Renting v/s owning
   c) Selection of site, soil, locality for a house
   d) Principles of planning a house, orientation aspect, prospect, privacy, roominess, grouping, flexibility, circulation, sanitation, furniture, requirement and practical considerations.

Section-B

1. **Furniture :** Basic considerations while, selection of furniture.
2. Element of Art : Line, form, shape, texture, size.
3. Principles of Art in relation to interior decoration, Harmony, Balance, Rhythm, Proportion and Emphasis.

Section-C

1. **Colour**
   a) Characteristic of colour
   b) Colour wheel
   c) Colour schemes
   d) Use of colour in Int. Decoration for various rooms.
3. Flower Arrangement, Types, Essential equipment used in flower arrangement, Selection of material, Application of elements and principles of Art in it.

Section-D

1. **Resources :** Classification of resources, Human & non-human, Factors affecting the use of resources.
2. **Money Management :** Types of income, budgeting, its advantages and limitations.
   (a) Planning of Budget
   (b) Means of supplementing family income.
3. **Time** : Steps in making plans, tools in time management—peak loads, work curves, rest periods.
4. **Energy Management :**
   (a) Introduction
   (b) Fatigue—types causes and effects of fatigue
   (c) Principles of work simplification
   d) **List of major equipment required for Home Mgt. Laboratories.**

   1) Geyser, 2) Refrigerator, 3) Vacuum Cleaner, 4) Food Processor, 5) Mixer, 6) Oven, 7) Tea Kettles, 8) Gas Stove, 9) Dinner sets, tea sets, cultery sets and other accessories for table settings, 10) Cement, marble, mosaic, tiles and wooden flooring for cleaning of different types of floors.

List of References, recommended for Home Management

1. Anna Hong Rutt, "Home furnishing," Wiley Eastern Ltd. New Delhi, 1973.
2. Hazel Thompson, Criag Old Day Rush, "Home with character." Universal Books Stall, Delhi, Kanpur, 1969.
3. Betty Pepis, "Interior Decoration a to z" Doubleday & Co., Inc. New York, 1965.
4. Julia Elements, "101 Ideas for flower arrangement", C. Arthur Pearson Ltd. London, 1963.
5. Walter Ian Fischman, Richard Demsbe, William Bernard, "Basic Home Repairs," A Grosset Super Good life Book Publishers, New York, 1975.
6. Ray Faulkner, Sarah Faulkner "Inside Today's Home." Holt, Rnehart & Winston, 1973.
7. R.S. Deshpandae, "Modern Ideal Home for India" United Book Corporation, Poona, 1983.
8. R.S. Deshpandae, Build your own home, United Book Corporation Poona, 1983.
9. Paulena Nickell & He Jean Muir Dorsey, "Management in Family Living," Wiley Eastern Ltd. 1983.
10. M.A. Varghese, N.M. Ogale, K. Srinivasan, "Home Management", Wiley Eastern Ltd., 1985.
11. The Educational Planning Group, Delhi, "Home Management," Arya Publishing House, New Delhi, 1986.
12. Stella Sounderaj, "A Text Book of House hold Arts", Orient Longman Ltd. 1974.
13. Irna H. Gross & Elizabeth Walbert Crandall, Management for Modern families, Wiley Eastern Ltd.
14. A Margaret Kaye, "A Student's Hand Book of Housewifery." J.M. Dent & Sons Ltd. London, 1958.
15. Amella Leaitt Hill, "Complete Book of Table setting and flower arrangement," Greystone Press.

16. Ball, Vetrio Kloss, "Art of Interior Design", The Macmillan Co., New York, 1962.
17. Goldstein 11.1. and Goldstein V. "Art in Everyday Life, Macmillan, New York, 1964.
18. Halse A.O. The use of colour in Interior, McGraw Hill Book Co. New York, 1961.
19. Swanson, Betty, "Introduction to Home Management" Macmillan Co., New York, 1981.

Journals

1. Indian Journal of Home Science, Home Science Association of India, Sri Avinashilingam Home Science College for Women, Coimbatore.
2. Inside Outside, Edited and published by Malliaka Sarabhai, Wadia Building, 19/21 Dalal Street, Bombay.
3. Journal of Home Economics, American Home Avenue, NW Washington.
4. Journal of Indian Housewife.

Home Science

Paper-A

Family Resource Management

(Practical)

Time : 3 hrs./week **Max. Marks-40**

Int. Ass.-10

1. Cleaning & Polishing of household metals, brass, copper, silver, gold, aluminium, iron, steel, non stick pans.
2. Cleaning of leather.
3. Cleaning of glass window panes.
4. Care and cleaning of refrigerators, food processors micro ovens.
5. Cleaning and polishing of wooden furniture.
6. Floor decoration-making of Alpana and Rangoli for different occasions.
7. Making of flower arrangement for different rooms.
8. Table setting, table manners and napkin foldings.

Home Science

Paper-B

Hygiene & Physiology

Time : 3 Hrs. **Max. Marks : 75**

Theory : 65

Int. Assess : 10

Instructions for the paper setter :

The question paper will consist of five sections A,B,C,D, & E. Section A,B,C,D, will have two questions from the respective sections of the syllabus and will carry 13 marks each. Section E will consist of very short type questions and will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt one question each from the section A,B,C, & D of the question paper and entire section E.

Section-A

1. **Hygiene**
   a) Definition of hygiene.
   b) Definition of infection, sources, carrier and control.
   c) Definition and types of immunity.
2. **Causes and spread of following diseases**
   a) Caused by insects-malaria dengue.
   b) Conveyed by ingestion-Enteric fever, cholera, dysentery, and diarrhea.
   c) Spread by drople infection, chicken pox, measles, in umps tuberculosis.
   d) Sexually transmitted diseases-AIDS.

Section-B

1. **Food Hygiene**
   a) Definition
   b) Hygiene during preparation, service and storage of food.
   c) Food poisoning, causes and prevention.
2. Purification and storage of Water for home.

Section-C

1. **Circulatory system**
    1. Blood and its composition
    2. Coagulation of blood
    3. Structure and functions of heart.
2. **Digestive system** : Structure and functions of the alimentary canal.

Section-D

1. Reproduction system-male and female sex organs and their functions.
2. Structure & Functions of lungs, kidney & skin.

References

1. Pearce Evelyn C. — Anatomy and Physiology for Nurses, Oxford University.
2. Best, Charles H. and Tylor N.B. — The Living Body–A Text in Human Physiology, Asia Publishing House.
3. Bedi, Y.P. — Hygiene and Public Health.
4. Phadke, Aids to Hygiene
5. Saxena, R.R. (1990) — Social and Prevention Medicines, CBS Publishers and Distributors, Delhi.
6. Selman, A.C. (1992) — Health and Longevity; Oriental Watchman Publishing House, Poona, India.
7. Bhatia B.C. and Sri P.N. (1968) — Elementary Hygiene, Oriental Longman.

Tourism and Travel Management (Vocational)

Year	Paper	Periods per week		Marks	
		L	T	Ext.	Int.
1st Year	**1. Tourism Business**	**3**	**3**	**50**	**50**
	2. Tourism Product	**3**	**3**	**50**	**50**

'On the Job Training' of 8 weeks

1. In each paper 10 questions will be set and the candidates will be expected to attempt 5 questions. Each question will carry 10 marks.
2. The Internal assessment shall be based on periodical tests, written assignments and class-participation.
3. A consolidated Report on **'On the Job Training'** after Ist year and IInd year shall be prepared by every student and must be submitted in the college concerned upto September 30. The Consolidated Roport will be evaluated by the external examiner and shall be given the grades as follows.

O	-	Outstanding
A	-	Very Good
B	-	Good
C	-	Average
D	-	Unsatisfactory

In case the training report is rated as unsatisfactory, the candidate shall have to submit it again incorporating the changes suggested by the examiner, within one month from the date of intimation to the candidate by the concerned college.

Tourism and Travel Management
Paper A
Tourism Business

Time: 3 Hours **Max. Marks : (External) : 50**
Internal : 50

Note :—The candidates are allowed to use simple (Non-Scientific) Calculators.

Introduction :-

This paper covers the history of tourism both International and Domestic. Its development with organizational and regulatory methodology. The concept dimensions trends world over and its futuristic study.

Part-II

Definition, nature, importance and components of tourism are also included in the study. This paper is designed to cover in prospects of Tourism. Insulation, organization both national and international in world in promotion & development- WTO, IATA, UPTADA, IA TATC, etc.

Part-II

1. Definition, nature, Importance, components and typology of Tourism.
2. Concepts of Domestic and International Tourism recent trends.
3. Tourism as an industry, visitor, tourist, excursionist.
4. Growth and development of Tourism in India.
5. Impacts of Tourism—Economics, Social, Physical and Environmental.

Suggested Readings :

1. Chritopher J. Holloway: The Business of Tourism: McDonald and Evans,1983.
2. A.K. Bhatia: Tourism Development, Principles and Practices: SterlingPublished (P) Ltd., New Delhi, 1983.

3. Anand, M.M.:	Tourism and Hotel Industry in India; Sterling Published (P) Ltd., New Delhi, 1990
4. Kaul, R.H.:	Dynamics of Tourism; A Terminology; Sterling Published (P) Ltd., New Delhi, 1996
5. IITTM	Growth of Modern Tourism, Monograph IITTM, New Delhi, 1989.
6. IITTM:	Tourism as an industry Monograph IITTM, New Delhi, 1989.
7. Burkart & Madlik	Tourism – Past, Present and Future, Heinemann, London, 1974
8. Wahab, S.E.:	Tourism Management : Tourism International Press, London, 1986.
9. Brymer, Robert A:	Introduction to Hotel and Restaurant Management : Hub Publication, Co., I/OWA, 1984.
10. Riccline J.R. Brent:	Travel and Tourism Hospitality, Research, London,1982.
11. Surinder Aggarwal:	Travel Agency Management Communication India, 1983.

Tourism and Travel Management (Vocational)
Paper B
Tourism Product

Time: 3 Hours **External : 50**
Internal: 50

Note :- The candidates are allowed to use simple (Non-Scientific) calculators.

Introduction

This paper is for the study of the Product-India covering the resources both nature and man-made. Historical and Geographical background. The people, the heritage, Ancilliary activities like arts, crafts, flora fauna environmental ecology and a study of the suitable development of Tourism connected with planning and area development.

Tourist Resources – Definition and Differentiation

Tourist Resources of India – types and typologies, cultural resource Art and architecture, Historical monument, religious and spiritual centres, fairs and festivals, craftsmanship, folk customs, costumes and dress museum monument and art Natural tourist Resources Rich diversity. In Land form and Landscape outstanding geographic features, climate.

Socio-Cultural Resources: I

Architectural Heritage of India: Glimpses of India's Architectural styles adopted over the ages. Historical: monuments of touristic significance-ancient medieval and modern-their spatial and regional dimensions. Important historical/archaeological sites. Important historical/archaeological sites, Museum, art gallaries and libraries-their location, assets and characterisitcs.

Popular Religious shrines/centers—Hindu Buddhist, Jain, Sikh, Muslim, Christian and others Yoga, meditation and other centres:

Socio-Cultural Resources: II

Performing arts of India, Classical Dances and Dance Styles: Centres of learning and performances. Indian folk dances.

Music and musical instruments: Different schools of Indian music status of vocal and instrumental music; new experiments.

Handicrafts of India as a potential tourist resources.. Fairs, and Festival-Social religious and commercial fairs: Festivals; promotional (tourism) fairs, viz: Kite festival White waterfestival sanke best race etc.

Indian folk culture- folk custom and costumes, settlement patterns, religious observations, folk-lore and legends.

Created tourist destinations, Academic, Scientific and industrial institutions.

Natural Tourist Resource-I

* Tourist resource potential in mountain with special reference to Himalayas : Resources and resource use patterns in the past present and future perspective.
* Indicate main desert areas, their geological structure: development as desert tourism-existing trends and facilities available, desert fair and desert festival.

Coastal areas, beaches and Islands : Resources and resource pattern.

Resources in Islands with special reference to Andaman and Nicobar Islands. Overview on Tourism Development strategies.

Books Recommended

1. Percy Brown Indian Architecture-Hindu and Budhist period.
2. Harla, J. C. The Art and Architecture of Indian sub continent.
3. Bhartiya Vidya Bhawan Imperial Unity
4. do-Classical age
5. Acharya Ram Tourism & Cultural Heritage of India Rousa Publications (Jaipur, 1986).

6. Basham Al. L.The Wonder that was India: Rupa and Co., Delhi-1988.
7. -do- The Gazettee of India ; History and Culture, Vol. 2, Publication Division Ministry of Information & Broadcasting, Government of India, 1988.
8. Hussain, A.A, The National Culture of India, National Book Trust New Delhi 1987.
9. Mukerji, R.K.The Culture and Art of India: George Allen Unwin Ltd.; London, 1959.
10. The Treasure of Indian Museums Marg Publications, Bombay.

FACULTY OF ARTS & SOCIAL SCIENCES AND SCIENCES

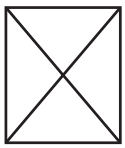
S Y L L A B U S

For

B.A./B.Sc. Part-I

(12+3 SYSTEM OF EDUCATION)

EXAMINATIONS - 2012



GURU NANAK DEV UNIVERSITY

AMRITSAR

B.A./B.Sc. Pass Course Examination
(12+3 System of Education)

PART-I

The Part-I examination shall be open to a candidate who has passed, not less than one academic year previously, any of the following examinations :-

i) Senior Secondary Certificate Part-II (12th Class) examination of the Punjab School Education Board.

OR

ii) Pre-Medical/Pre-Engineering examination of this University.

OR

iii) Any other examination recognised by this University as equivalent to any of the examinations, mentioned under (i) to (ii) above shall also be admitted to the Part-I examination if he fulfils other conditions such as combination of subjects and/or minimum percentage of marks required for that examination.

iv) A candidate who has passed +2 examination under 10+2 System of Education from P.S.E.B. or any other examination recognized by the University as equivalent thereto (with English as Compulsory Subject) shall be eligible for admission to 1st year (Part-I) class of B.Sc. Home Science.

Note : The candidates having compartment in +2 examination shall not be eligible for admission to any undergraduate course.

NOTE: DETAILED ORDINANCES RELATING TO EXAMINATION FOR THIS CLASS ARE CONTAINED IN THE GURU NANAK DEV UNIVERSITY CALENDAR, VOL. II, READ WITH SYNDICATE DECISIONS/AMENDMENTS MADE FROM TIME TO TIME.

Combination of Subjects for B.A./B.Sc. Part-I

(12+3 System of Education)

Compulsory Subjects : Two

1. English (compulsory)
2. Punjabi (compulsory)/Punjab History & Culture

Elective Subjects : Three

(A candidate shall select three subjects in all selecting not more than one subject from any of the following sets of combinations)

Group	Subjects
1.	English/Hindi/Punjabi/Sanskrit/Bangla/Urdu/Persian/Tamil/Assamese/French/Arabic/Russian/German.
2.	Economics/Defence Studies/Sociology/Fine Arts/Education/Adult Education/History of Arts/Commercial Arts/Sculpture.
3.	History/Mathematics/Psychology/Ancient Indian History & Culture/Folk Arts and Culture/Quantitative Techniques/Religious Studies.
4.	Political Science/Indian Classical Dance/Stat./App. Stat/Commerce/Electronics.
5.	Public Admn./Home Science/Physical Education/Computer Science/Dramatic Arts.
6.	Philosophy/Geography/Music Vocal/Music Inst./Tabla/Rural Development/Agri. Economics and Marketing/Ind. Economics.

Note :1. The candidates shall be asked to offer both Hindi & Sanskrit as elective subjects from Group No. 1.

2. The candidates shall also be allowed to offer both Music (Vocal) & Music (Instrumental) as Elective Subjects from Group No. 6.
3. The combination of Home Science with Computer Science as Elective subject is allowed.

4. The blind candidates shall be allowed to offer any two elective subjects out of Music (Vocal), Music (Instrumental) and Tabla from Group No. 6.
5. The subject of Environmental Studies will be taught in 2nd year of all the undergraduate degree classes from the Session 2007-08. However, if a candidate fails to pass this paper in the 2nd year, two consecutive chances i.e. one supplementary and other along with 3rd year may be given to him/her. The marks obtained by the candidate in this paper will not be added to the total marks obtained, and the result will be entered as "Pass" in the DMC of the third year certificate if he/she obtains at least 35% marks in the paper.

Vocational course subjects : Functional English, Office Management and Secretarial Practice, Computer Equipment Maintenance, Clinical Nutrition Dietetics, Tax Procedure and Practices, Functional Sanskrit, Functional Punjabi, Functional Hindi, Still Photography and Audio Products, Advertisement Sales Promotion and Sales Management, Computer Applications, Industrial Chemistry, Food Science and Quality Control, Microbiology, Tourism and Travel Management, Early Childhood Care & Education.

Refrigeration & Air Conditioning, Dairy Farming, Non-Conventional Energy Sources, Journalism & Mass Communication, Automobile Maintenance, Fashion Design & Garment Construction, Mass Communication & Video Production, Fundamentals of Industrial Microbiology, Biotechnology, Information Technology, Jewellery Design, Cosmetology.

Note: The subject of 'Human Genetics' may be offered as an elective subject in combination with any other Life Sciences subject, with English, Punjabi and Chemistry being compulsory subjects.

Note : Tourism & Hotel Management should not be taken alongwith Tourism and Travel Management.

CONTENTS