

# SYLLABUS

FOR

## B.A./B.SC. (Part – III)

(12+3 SYSTEM OF EDUCATION)  
(ANNUAL SYSTEM)

**Examination: 2014**



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## GURU NANAK DEV UNIVERSITY AMRITSAR

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(ii) Subject to change in the syllabi at any time.  
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**PART-III**

- i) The Part-III examination shall be open to a candidate who has passed, not less than one academic year previously, Part-II (under 10+-2+3 System of Education) examination of the B.A./B.Sc. of this University.
- ii) Any other examination recognised by this University as equivalent to any of the corresponding examinations mentioned above.

**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.**

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**ENGLISH (COMPULSORY)****Time: 3 Hours****Max. Marks: 100****Texts Prescribed:**

1. *All My Sons*, Arthur Miller.
2. *Poems of Nature and Culture*, Guru Nanak Dev University, Amritsar.

**The following Poems are excluded:**

1. *Stanzas Written in Dejection Near Naples* by P.B. Shelley.
  2. *Words* by W.B. Yeats.
  3. *Piano* by D.H. Lawrence.
  4. *La Figlia Che Piange* by T.S. Eliot.
  5. *Funeral Blues* by W.H. Auden.
  6. *The Express* by Stephen Spender.
  7. *Do Not Go Gentle into That Good Night* By Dylan Thomas.
  8. *The Thought-Fox* by Ted Hughes.
  9. *Night of Scorpion* by Nissim Ezekiel.
  10. Honeymoon Flight
3. *Murphy's English Grammar* (Raymond Murphy), 3<sup>rd</sup> Edition, CUP 2004, Rept. 2005. (Units: 92-97, 113-145).

**Instructions for the Paper Setter / Examiner:**

**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 92-97, 113-145 of *Murphy's English Grammar (Reymond Murphy)*, 3rd Edition, CUP. 2004 Rept. 2005. Each question will carry two marks. All questions will be compulsory.

**Section-B:** It will consist of eleven (11) questions. Students will be required to attempt eight (8) questions. Each question will carry six (6) marks. The total marks for this section will be 48.

Eight (08) questions (Q. I-VIII) will be set from the two literary texts four from the plays and four from Poems. The question on literary texts will include two reference to context questions on the play and the poems. The students will be required to attempt any five (5) choosing at least two (2) questions from each prescribed text. The questions (Q. I-VIII) from literary texts will be answered in about 15 lines each.

The questions (IX-XI) set on vocabulary and composition will be compulsory.

Question IX will be set on vocabulary introduced in the two prescribed *Texts*. The question should test meaning and usage of items glossed in the texts.

Question X will be precis making.

Question XI will be comprehension of an unseen prose passage. Three short-answer questions of 2 marks each shall be set on the given passage.

**Section-C:** It will consist of 4 questions each carrying 8 marks. Total marks for this section will be 32.

Questions I and II will be set from the prescribed Play and Poems I respectively. Each question will have internal choice and has to be answered in not more than 300 words.

Question III will be essay writing. The examiner will give 4 topics relating to current affairs and the students will be required to write an essay of about 300 words on any one of them.

Question IV will relate to business writing like resume writing, business letters, report writing etc. The examiner may offer internal choice between different writing tasks.

**Suggested Reading:**

*Oxford Guide to Effective Writing and Speaking* by John Seely.

**ENGLISH (ELECTIVE)****PAPER-A****Time: 3 Hours****Max. Marks: 100****Books Recommended:**

1. **Henrik Ibsen:** A Doll's House.
2. **Magic Moments:** A Selection of Poems (Guru Nanak Dev University Publication).

**TESTING****SECTION-A**

- Q. I. Five very short answer questions (out of 8) to be answered in about five lines each from **A Doll's House**. 5X2=10 Marks
- Q. II. Five very short questions (out of 8) to be answered in about five lines each from **Magic Moments: a selection of Poems**. 5X2=10 Marks

**SECTION-B**

- Q. III. Four passages with internal choice (two from **A Doll's House** and two from **Magic Moments** to be attempted) for explanation with reference to context. 4x6=24 Marks
- Q. IV. Four short answer questions (out of 7) two from each book to be attempted in about 15 lines each. 4x6=24 Marks

**SECTION-C**

- Q. V. Essay type questions with internal choice from **A Doll's House** (Approx. 5 pages). 16 Marks
- Q. VI. Essay type questions with internal choice from **Magic Moments** (Approx. 5 pages). 16 Marks



**ENGLISH (ELECTIVE)****PAPER-B****Time: 3 Hrs.****Max Marks: 100****Books Prescribed:**

1. R.K. Narayana: **The Ramayan**; Orient Paperbacks, 2003.
2. B. Prasad: **A Background to the Study of English Literature**, Macmillan India Ltd. (Section I/Ch., IV; Section II/Ch. VI and VII; Section III/Ch. IV and V are excluded).

**Suggested Pattern of Question Paper.****Section-A:**

Ten questions each of 2 marks shall be asked as follows:

1. Five very short-answer questions (approximately 5 lines each) from **The Ramayan**.
2. Five very short-answer questions (approximately 5 lines each) from B. Prasad's book. The questions shall deal with simple definitions and examples of literary terms introduced in the book.  $(5+5) \times 2 = 20$  Marks

**Section-B**

Eight questions each of 6 marks shall be asked as follows:

1. Four short-answer questions (out of 6) to be answered in about 10-15 lines each from **The Ramayan**.
2. Four short-answer questions (out of 6) to be answered in about 10-15 lines each from B. Prasad's book. Questions of both theoretical and practical nature requiring understanding of literary concepts and developments may be asked. At least two questions may be set on the analysis of passages/poems that clearly exhibit the use of literary devices discussed in the book.  $(4+4) \times 6 = 48$  Marks

**Section-C**

Two questions each of 16 marks shall be asked as follows:

1. One essay type question (3 to 4 pages) with internal choice from **The Ramayan**.
2. One essay type question (3 to 4 pages) with internal choice may be set on the structure of development of any of the genres discussed in B. Prasad's book.  $(1+1) \times 16 = 32$  Marks

**FUNCTIONAL ENGLISH (VOCATIONAL)****PAPER-I: PRINT JOURNALISM****Time: 3 Hours****Marks: 100****Theory: 75****Practical: 25****Instructions for the Paper Setters:**

The paper shall consist of 3 Sections. Section-A carries 16 marks, Section-B carries 35 marks and Section-C carries 24 marks.

**Section-A** will require student to write 8 short notes of 2 marks each. The question will test student's awareness about various aspects of journalistic terms.

**Section-B** will have seven questions of 7 marks each, out of which students will attempt only 5. The questions will relate to specific issues given in Unit-I to VII. There will be atleast three questions of practical nature.

**Section-C** will have two questions with internal choice each of 12 marks. The questions will require students to demonstrate practical knowledge in writing various features for the print media.

**Note:** There will be practical examination of 25 marks. An external examiner will conduct the examination by giving on the spot news/report writing test (10 on aspects of feature writing and interviewing the students).

**Objectives:** To generate awareness among learners of issues deserving reporting in print and to simulate them to respond to their environment in print.

To enable learners to write news stories from the stage of news gathering to editing to their final presentation. To enable learners to acquire the art and skills of feature writing to encourage freelancing among them.

**Course Contents:****Unit-I: An Introduction to Print Media**

- Print Media and Communication
- Definition of Communication
- Scope of Communication : Its purpose and forms

**Unit-II: Reporting**

- Sources of Information
- Distinguishing Factual News Reporting from Interpretative and
- Analytical Reporting

**Unit-III: Investigate Journalism**

- Writing the Questions
- Reporting from Interviews - Format, Style and Content

**Unit-IV: Writing News Stories**

- Essentials of News Writing—the Headlines—the Leads—the Body and Conclusion—the Art and Skills of Writing for Different Purposes.

**Unit-V: Areas in News Reporting**

- Reporting Obituaries, Weather, Sports, Science, Business, Art and Culture, Education, Agriculture, Fashion, Community Service etc.

**Unit-VI: The Reader**

- Understanding the Reader

**Unit-VII: Feature Writing**

- Defining a Feature ( a lyric in Prose)—the Crafts of Feature Writing—Distinguishing a Feature from other Forms of Newspaper/Magazine, Writing—Researching before Writing—Titles and Leads—Packaging a Feature with interest, Humour, Pictures and other Ingredients—Areas for Feature Writing (middles, reviews)—Freelancing and Feature Writing.

**Mode of Examination:**

|                     |                             |
|---------------------|-----------------------------|
| Written: 75 Marks   | Section - A 02x8 = 16 Marks |
| Viva-Voce: 25 Marks | Section - B 07x5 = 35 Marks |
| Total: 100 Marks    | Section - C 12x2 = 24 Marks |

**Bibliography:**

- |                                  |   |
|----------------------------------|---|
| Ahuja, E.N. & S.S. Chhabra       | <i>Reporting</i> , Surjeet Publications, New Delhi, 1990.                       |
| Drewry, John E                   | <i>Book Reviews</i> , The Writer, Inc. Bosten, 1945                             |
| Nicholis, Brian                  | <i>Features with Flair</i> , Press Institute of India, New Delhi, 1972.         |
| Patterson, Helen M.              | <i>Writing and Selling Feature</i> , Articles, Prentice Hall, New York, 1950.   |
| Steigheiman, M.                  | <i>Writing the Feature Article</i> , Macmillan, New York, 1950.                 |
| Copetake, T.                     | <i>Editing Super 8</i> , Focal Press Ltd., London, 1980.                        |
| Critchfield, Richard P.          | <i>The Indian Reporters Guide</i> , Allied Pacific, Bombay, 1962.               |
| George, TJS                      | <i>News Editing</i> , Indian Institute of Mass Communication, New, Delhi, 1989. |
| Tayler, Howard B and Jacob Scher | <i>Copy Reading and News Editing</i> , Prentice Hall, New York, 1955.           |
| Warren, Carl H.                  | <i>Modern News Reporting</i> , Harper, New York, 1973.                          |

**FUNCTIONAL ENGLISH (VOCATIONAL)**  
**PAPER-II: OFFICE COMMUNICATION FOR BUSINESS**

**Time: 3 Hrs.**

**Total Marks: 100**  
**Written Paper: 75**  
**Objectives Practical: 25**

- To equip learners with language proficiency in business/work situations.
- To equip learners with techniques of written communication in business situations.
- To expand vocabulary and develop reading comprehension of material related to business.
- To make learners aware of features of business communication through various modes.

**Course Contents:**

**Unit-I : Business Communication:**

- The format of business letters and faxes: Different types of formats, address, opening and closing, subject, heading, subheading, numbering etc.
- Writing letters of application with curriculum vitae/resume, letters of invitation, reply of invitation, enquiry, conference arrangements, reference, announcing forthcoming events, products, visits, making booking for trade fairs, complaints and replies to complaints, apologies, thanks, etc.
- Writing office memos and notes.

**Unit-II : Business Meetings:**

- Writing notices, agendas, resolutions, minutes of business meetings, preparing notes for a meeting.

**Unit-III : Telephonic Interaction in Business:**

- Taking messages, making appointments, making enquiries regarding travel bookings, hotel bookings, services, business trading (stocks etc.), placing orders, receiving orders, apologizing, complaining, giving information, etc.

**Unit-IV : Dealing with clients and customers:**

- Describing products and services
- Describing processes
- Persuading clients
- Negotiating and agreement

**Suggestions for Teaching:**

Along with training in written communication in business, role play, simulation of business situations and playing tape recorded material (e.g. Interview, telephonic conversations) may be used to equip the learners with language proficiency required in work situations. The same may be tested in practical.

**Mode of Examination:**

1. There will be a 3-hour written paper of 75 marks. The Question Paper shall consist of three sections :

Section-A carries 30 marks, Section-B 20 marks and Section-C 25 marks.

**Section-A**

One objective type question of 10 marks consisting of 10 items of business vocabulary shall be set. Items may be of multiple choice type or one word substitution.

Two questions each of 10 marks shall be set on various types of business correspondence. Examiner may offer internal choice in these questions.

**Section-B**

6 short questions each of 2 marks shall be set on different business terms used in various types of meetings. Students will be asked to attempt only four. (8 marks).

Two questions with internal choice of 6 marks each shall be set to test various skills as required in writing notices, agenda and minutes etc. Students may be provided with necessary data for use in these tasks.

**Section-C**

One question of 10 marks shall be asked to present a likely telephonic conversation on a business topic in the written mode.

Two questions with internal choice one of 8 marks and one of 7 marks be asked on the description of products, services and process or handling customer complaint.

There will be a practical task of 25 marks on different business tasks performed orally or in written mode. The external examiner for practical work shall also give due weighing to the training file of each student at the time of evaluation.

**Books Recommended:**

1. *Oxford Guide to Effective Writing and Speaking* by John Seely.
2. *A Course in Grammar and Composition* by Geetha Nagaraj, Foundation Books, 2006.

## ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁਲ ਅੰਕ : 100

ਸਲੇਬਸ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

1. ਜੱਗ ਬੀਤੀ ਹੱਡ ਬੀਤੀ (ਕਥਾ ਸੰਗ੍ਰਹਿ)  
(ਸੰਪਾ. ਡਾ. ਜੁਗਿੰਦਰ ਸਿੰਘ ਰਾਹੀਂ) ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ, 2008.
2. ਗਿਆਨ ਮਾਲਾ (ਵਿਗਿਆਨਕ ਤੇ ਸਮਾਜ-ਵਿਗਿਆਨਕ ਲੇਖਾਂ ਦਾ ਸੰਗ੍ਰਹਿ)  
(ਸੰਪਾ. ਡਾ. ਸਤਿੰਦਰ ਸਿੰਘ, ਪ੍ਰੋ. ਮਹਿੰਦਰ ਸਿੰਘ ਬਨਵੈਤ), ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ, 2007.

ਇਸ ਪੁਸਤਕ ਵਿਚ ਹੇਠ ਲਿਖੇ ਪੰਜ ਨਿਬੰਧ ਨਿਰਧਾਰਿਤ ਹਨ :

1. ਪਹੀਆ ਪ੍ਰਦੂਸ਼ਣ (ਭਜਨ ਸਿੰਘ ਲਾਰਕ)
  2. ਭਰੂਣ ਹੱਤਿਆ ਦੇ ਦੋਸ਼ ਵਿੱਚ (ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ, ਪਰਮਜੀਤ ਸਿੰਘ ਸਿੱਧੂ)
  3. ਨਾਰੀ ਸ਼ਕਤੀ (ਬਲਵਿੰਦਰ ਕੌਰ ਅਰੋੜਾ)
  4. ਵਾਤਾਵਰਣੀ ਪ੍ਰਦੂਸ਼ਣ ਅਤੇ ਮਨੁੱਖ (ਡੀ.ਪੀ. ਸਿੰਘ)
  5. ਏਡਜ਼ : ਇੱਕ ਗੰਭੀਰ ਸੰਕਟ (ਸ਼੍ਰੀਮਤੀ ਕੈਲਾਸ਼ਪੁਰੀ)
3. ਲੇਖ ਰਚਨਾ (ਵਿੱਦਿਅਕ ਅਤੇ ਸਭਿਆਚਾਰਕ ਵਿਸ਼ਿਆਂ ਬਾਰੇ 500 ਸ਼ਬਦਾਂ ਦੀ)
  4. ਸਰਲ ਅੰਗਰੇਜ਼ੀ ਪੈਰ੍ਹੇ ਦਾ ਪੰਜਾਬੀ ਵਿੱਚ ਅਨੁਵਾਦ
  5. ਵਿਆਕਰਣ:
    - (ੳ) ਨਾਉ ਵਾਕੰਸ਼ : ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਤੇ ਪ੍ਰਕਾਰ
    - (ਅ) ਕਿਰਿਆ ਵਾਕੰਸ਼ : ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਤੇ ਪ੍ਰਕਾਰ
    - (ੲ) ਵਾਕਾਤਮਕ ਜੁਗਤਾਂ : ਮੇਲ ਤੇ ਅਧਿਕਾਰ
    - (ਸ) ਕਾਰਕ ਅਤੇ ਕਾਰਕੀ ਸਬੰਧ

ਅੰਕ-ਵੰਡ ਤੇ ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ:

- |  |              |
|--|--------------|
| 1. ਕਿਸੇ ਇਕ ਕਹਾਣੀ ਦਾ ਵਿਸ਼ੇ-ਵਸਤੂ/ਸਾਰ (ਦੋ ਵਿਚੋਂ ਇਕ)   | 20 ਅੰਕ       |
| 2. ਕਿਸੇ ਇਕ ਨਿਬੰਧ ਦਾ ਸਾਰ ਵਿਸ਼ੇ-ਵਸਤੂ/ਸਾਰ (ਦੋ ਵਿਚੋਂ ਇਕ)   | 20 ਅੰਕ       |
| 3. ਲੇਖ : ਤਿੰਨਾਂ ਵਿਚੋਂ ਕਿਸੇ ਇਕ ਵਿਸ਼ੇ ਉਤੇ  | 10 ਅੰਕ       |
| 4. ਸਰਲ ਅੰਗਰੇਜ਼ੀ ਪੈਰ੍ਹੇ ਦਾ ਪੰਜਾਬੀ ਵਿਚ ਅਨੁਵਾਦ  | 10 ਅੰਕ       |
| 5. ਨੰਬਰ 5 ਉਤੇ ਨਿਰਧਾਰਿਤ ਵਿਆਕਰਣ ਵਿਚੋਂ ਵਰਣਨਾਤਮਕ ਪ੍ਰਸ਼ਨ  | 20 ਅੰਕ       |
| 6. ਉਪਰੋਕਤ ਲੜੀ ਨੰਬਰ 1 ਅਤੇ 2 ਦੀਆਂ ਪੁਸਤਕਾਂ ਵਿਚੋਂ ਸੰਖੇਪ ਉਤਰਾਂ ਵਾਲੇ 10 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ । ਹਰੇਕ ਦਾ ਉਤਰ 50 ਸ਼ਬਦਾਂ ਤੋਂ ਵੱਧ ਨਾ ਹੋਵੇ । | 10x02=20 ਅੰਕ |

**PUNJAB HISTORY AND CULTURE (1849-1970)**  
**(SPECIAL PAPER IN LIEU OF PUNJABI COMPULSORY)**

**Time: 3 Hours**

**Max. Marks: 100**  
**Total Teaching periods: 75**

**Note: Instructions for the Paper Setters:**

**Each question paper shall 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 shall attempt any 4 questions in atleast 5 pages each. Each question shall carry 18 marks. The total weightage of this section shall be 72 marks.

1. The early British Administration.
2. British policies towards Agriculture, Industry, Trade and Commerce.
3. Spread of Modern Education in the Punjab.
4. Socio-Religious Reform Movements: Arya Samaj, Singh Sabha and Ahmadiyas.
5. Growth of political consciousness in the Punjab upto 1907.
6. Struggle against the raj with special reference to ghadar movement, Jallianwala Bagh Tragedy, Gurdwara Reform Movement, Non-cooperation and Civil Disobedience Movement.
7. Towards Independence and Partition 1940-1947.
8. Eminent Freedom fighters of the Punjab—Lajpat Rai, Sohan Singh Bhakna, Kartar Singh Sarabha, Udham Singh, Saifuddin Kitchlew, Kharak Singh and Bhagat Singh.
9. Great writers of the Punjab—Bhai Vir Singh, Mohammed Iqbal, Puran Singh, Ishwar Chander Nanda, Dhani Ram Chatrik and Mohan Singh.

**Section-D**

10. Achievements of Punjab Since 1947; Development of Agriculture (Green Revolution), Irrigation.
11. Development of Industry, Transport & Education.
12. Formation of Punjabi Suba.

**Suggested Readings:**

1. Fauja Singh (ed.) : History and Culture of the Punjab, Part-III, Patiala, 1987.
2. G.S. Chhabra : The Advanced History of the Punjab, Vol. II.
3. Khushwant Singh : A History of the Sikhs, Vol. II, 1839-1988, Delhi, 1991.
4. Fauja Singh : Eminent Freedom Fighters of Punjab, Patiala, 1972.

ਪੰਜਾਬੀ (ਇਲੈਕਟਿਵ)  
ਪਰਚਾ - ਏ

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁਲ ਅੰਕ : 100

ਸਲੇਬਸ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ:

1. ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਹਿ (1700 ਈ. ਤਕ) (ਸੰਪਾ.) ਡਾ. ਗੁਰਸ਼ਰਨ ਕੌਰ ਜੱਗੀ ਤੇ ਡਾ. ਮਾਨ ਸਿੰਘ ਢੀਂਡਸਾ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2007.  
ਹਰੇਕ ਕਵੀ ਦੇ ਪਹਿਲੇ ਪੰਜ-ਪੰਜ ਸ਼ਬਦ/ਬੰਦ/ਸ਼ਲੋਕ/ਪਦੇ/ਕਾਫੀਆਂ 40 ਅੰਕ
2. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਵਾਰਤਕ: ਪੰਜਾਬ ਦੇ ਮਹਾਨ ਕਲਾਕਾਰ (ਬਲਵੰਤ ਗਾਰਗੀ) ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ, 2007. 30 ਅੰਕ
3. ਪੰਜਾਬੀ ਨਾਟਕ : ਤੱਤੀ ਤਵੀ ਦਾ ਸੱਚ-ਆਤਮਜੀਤ, ਪੰਜਾਬੀ ਸਭਿਆਚਾਰਕ ਕੇਂਦਰ, ਦਿੱਲੀ, 2006. 30 ਅੰਕ

ਯੂਨਿਟ ਅਤੇ ਥੀਮ:

1. ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਹਿ (1700 ਈ. ਤਕ)  
(ੳ) ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ (ਚਾਰ ਵਿਚੋਂ ਦੋ) 10+10=20 ਅੰਕ  
(ਅ) ਕਿਸੇ ਇਕ ਕਵਿਤਾ ਦਾ ਵਿਸ਼ੈ ਵਸਤੂ/ਕਵੀ ਬਾਰੇ ਜਾਣਕਾਰੀ ਅਤੇ ਉਸਦਾ ਯੋਗਦਾਨ (ਦੋ ਵਿਚੋਂ ਇਕ) 10 ਅੰਕ  
(ੲ) ਮਲਟੀਪਲ ਚੋਣ ਪ੍ਰਸ਼ਨ 05x02=10 ਅੰਕ
2. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਵਾਰਤਕ : ਪੰਜਾਬ ਦੇ ਮਹਾਨ ਕਲਾਕਾਰ: ਵਾਰਤਕ-ਰਚਨਾ ਦਾ ਵਿਸ਼ੈ ਵਸਤੂ/ਰੂਪ/ਭਾਸ਼ਾ ਸ਼ੈਲੀ (ਦੋ ਵਿਚੋਂ ਇਕ) 20 ਅੰਕ
3. ਪੰਜਾਬੀ ਨਾਟਕ : ਤੱਤੀ ਤਵੀ ਦਾ ਸੱਚ : ਨਾਟਕ ਦਾ ਵਿਸ਼ੈ ਵਸਤੂ/ਕਥਾਨਕ/ਪੱਤਰ/ਮੰਚ ਯੋਗਤਾ (ਦੋ ਵਿਚੋਂ ਇਕ) 20 ਅੰਕ
4. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਵਾਰਤਕ : ਪੰਜਾਬ ਦੇ ਮਹਾਨ ਕਲਾਕਾਰ ਅਤੇ ਤੱਤੀ ਤਵੀ ਦਾ ਸੱਚ ਵਿਚੋਂ ਪਾਠ ਆਧਾਰਿਤ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ (ਛੇ ਵਿਚੋਂ ਚਾਰ) 04x05=20 ਅੰਕ



ਪੰਜਾਬੀ (ਇਲੈਕਟਿਵ)  
ਪਰਚਾ – ਬੀ

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁਲ ਅੰਕ : 100

1. ਪੰਜਾਬੀ ਸਾਹਿਤ ਦਾ ਇਤਿਹਾਸ (1700 ਈ. ਤਕ)

(ਸੰਪਾ.) ਡਾ. ਧਰਮ ਸਿੰਘ, ਡਾ. ਹਿਰਦੇਜੀਤ ਸਿੰਘ ਭੋਗਲ, ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ, 2007.

ੳ) ਸਾਹਿਤਕ ਰੂਪ, ਧਾਰਾਵਾਂ ਅਤੇ ਪ੍ਰਵਿਰਤੀਆਂ

ਅ) ਸਾਹਿਤਕ ਰੂਪ, ਦੇ ਸਮੁੱਚੇ ਵਿਕਾਸ ਬਾਰੇ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ।

(ਵਿਅਕਤੀਗਤ ਸਾਹਿਤਕਾਰ ਸਬੰਧੀ ਪ੍ਰਸ਼ਨ ਨਹੀਂ ਪੁੱਛਿਆ ਜਾਵੇਗਾ) ।

ਉਪਰੋਕਤ ਦੋਹਾਂ ਭਾਗਾਂ ਵਿਚੋਂ ਦੋ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ, ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਪ੍ਰੀਖਿਆਰਥੀਆਂ ਨੇ ਇਕ ਇਕ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨਾ ਹੋਵੇਗਾ ।

20+20=40 ਅੰਕ

2. ਸਾਹਿਤ ਅਤੇ ਹੋਰ ਅਨੁਸ਼ਾਸਨ

ਆਲੋਚਨਾ ਦੀ ਪਰਿਭਾਸ਼ਾ ਤੇ ਪ੍ਰਯੋਜਨ, ਸਾਹਿਤ ਦੇ ਤੱਤ, ਸਾਹਿਤ ਅਤੇ ਸਮਾਜ, ਸਾਹਿਤ ਅਤੇ ਮਨੋਵਿਗਿਆਨ, ਸਾਹਿਤ ਅਤੇ ਇਤਿਹਾਸ, ਸਾਹਿਤ ਅਤੇ ਸ਼ਖਸੀਅਤ, ਸਾਹਿਤ ਅਤੇ ਵਿਚਾਰਧਾਰਾ, ਸਾਹਿਤ ਅਤੇ ਸਭਿਆਚਾਰ (ਤਿੰਨ ਵਿਚੋਂ ਦੋ) ।

10+10=20 ਅੰਕ

3. (ੳ) ਛੰਦ : ਦੋਹਿਰਾ, ਸੋਰਠਾ, ਕਬਿੱਤ, ਕੋਰਤਾ, ਚੌਪਈ, ਸਿਰਖਛੰਦੀ, ਸਵੱਈਆ ਬੈਂਤ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਲੱਛਣ (ਚਾਰ ਵਿਚੋਂ ਦੋ)

5+5=10 ਅੰਕ

(ਅ) ਗੱਦ ਸ਼ੈਲੀ ਨਾਟਕ, ਸਫਰਨਾਮਾ, ਜੀਵਨੀ, ਸਵੈ-ਜੀਵਨੀ : ਪਰਿਭਾਸ਼ਾ, ਪ੍ਰਕਾਰ ਤੇ ਤੱਤ (ਦੋ ਵਿਚੋਂ ਇਕ) 10 ਅੰਕ

4. ਵਿਹਾਰਕ ਆਲੋਚਨਾ : ਮੱਧਕਾਲੀ ਕਾਵਿ 'ਤੇ ਮੱਧਕਾਲੀ ਵਾਰਤਕ ਦੇ ਸੰਦਰਭ ਵਿਚ (ਕਵਿਤਾ ਜਾਂ ਵਾਰਤਕ ਦੇ ਦੋ ਵਿਚੋਂ ਕਿਸੇ ਇਕ ਟੁਕੜੇ ਦੀ)

20 ਅੰਕ

**ਕਾਰਜੀ (ਫੰਕਸ਼ਨਲ) ਪੰਜਾਬੀ**

**ਪ੍ਰਯੋਜਨ :** ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਚ ਸੂਚਨਾ ਤਕਨਾਲੋਜੀ ਨਾਲ ਜਾਣ ਪਛਾਣ ਅਤੇ ਪੰਜਾਬੀ ਵਿਚ ਇਸ ਦੀ ਵਰਤੋਂ ।

**ਪਰਚਾ ਏ :** (ਬਿਊਰੀ)

**ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਸੂਚਨਾ ਤਕਨਾਲੋਜੀ**

**ਸਮਾਂ :** 2 ਘੰਟੇ

**ਕੁਲ ਅੰਕ :** 100

**ਬਿਊਰੀ ਅੰਕ :** 50

ੳ. ਪੰਜਾਬੀ ਉਚਾਰਨ ਅਤੇ ਗੁਰਮੁਖੀ ਔਰਥੋਗ੍ਰਾਫੀ : ਪੰਜਾਬੀ ਧੁਨੀਆਂ ਅਤੇ ਗੁਰਮੁਖੀ ਦਾ ਸੰਬੰਧ (ਆਈ.ਪੀ.ਏ. ਦੀ ਮਦਦ ਨਾਲ)

**20 ਅੰਕ**

ਅ. ਸੂਚਨਾ ਤਕਨਾਲੋਜੀ : ਪਰਿਭਾਸ਼ਾ, ਮਹੱਤਵ, ਭਾਸ਼ਾ ਅਤੇ ਸੂਚਨਾ ਤਕਨਾਲੋਜੀ, ਸਾਹਿਤ ਤੇ ਸੂਚਨਾ ਤਕਨਾਲੋਜੀ ।

**15 ਅੰਕ**

ੲ. ਕੰਪਿਊਟਰ ਸੌਫਟਵੇਅਰ : ਕੰਪਿਊਟਰ ਅਪਰੇਟਰ ਸਿਸਟਮ-ਐਮ.ਐਸ. ਆਫਿਸ (4,3,6,0,7,0) ਪੇਜ ਮੇਕਰ ਆਦਿ ।

**15 ਅੰਕ**

**ਪਰਚਾ ਏ :** ਪ੍ਰੈਕਟੀਕਲ

**ਭਾਸ਼ਾ ਪ੍ਰਯੋਗਸ਼ਾਲਾ ਵਿਚ ਅਭਿਆਸ ਕਰਨਾ**

**ਪ੍ਰੈਕਟੀਕਲ ਅੰਕ: 50**

ੳ. ਪੰਜਾਬੀ ਉਚਾਰਨ ਸੁਣ ਕੇ ਗੁਰਮੁਖੀ ਅੱਖਰਾਂ ਅਤੇ ਅੰਤਰ-ਰਾਸ਼ਟਰੀ ਧੁਨੀ ਲਿਪੀ ਵਿਚ ਲਿਖਣਾ (ਪੰਜ-ਪੰਜ ਮਿੰਟਾਂ ਦੇ ਚਾਲੀ ਅਭਿਆਸ)

ਅ. ਵਿਆਕਰਣਕ ਵਰਗਾਂ ਦੇ ਆਧਾਰ 'ਤੇ ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਦੇ ਰੂਪਾਂ ਦੀ ਪਹਿਚਾਣ ਕਰਨਾ ਅਤੇ ਰੂਪ ਸਿਰਜਣੇ (ਪੰਜ-ਪੰਜ ਮਿੰਟਾਂ ਦੇ ਚਾਲੀ ਅਭਿਆਸ)

ੲ. ਬਿਊਰੀ ਵਿਚ ਦਿੱਤੇ ਗਏ ਵਿਸ਼ਿਆਂ ਉਤੇ ਘਟੋ-ਘੱਟ 35 ਵਾਕਾਂ ਵਾਲੇ ਭਾਸ਼ਣ ਦੇਣ ਦਾ ਅਭਿਆਸ (ਚਾਲੀ ਅਭਿਆਸ)

**ਕਾਰਜੀ (ਫੰਕਸ਼ਨਲ) ਪੰਜਾਬੀ****ਪਰਚਾ ਬੀ : (ਪ੍ਰੈਕਟੀਕਲ)****ਪੰਜਾਬੀ ਵਿਚ ਕੰਪਿਊਟਰ ਦੀ ਵਰਤੋਂ ਦਾ ਅਭਿਆਸ****ਸਮਾਂ : 2 ਘੰਟੇ****ਕੁਲ ਅੰਕ: 100****ਪ੍ਰੈਕਟੀਕਲ ਅੰਕ : 80****ਮੌਖਿਕ ਪ੍ਰੀਖਿਆ : 20****ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ:**

1. ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਲੇਖ, ਪੱਤਰ, ਨੋਟ ਆਦਿ ਕੰਪਿਊਟਰ ਰਾਹੀਂ ਤਿਆਰ ਕਰਕੇ ਪ੍ਰਿੰਟ-ਆਊਟ ਲੈਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ।  
(ਪ੍ਰੈਕਟੀਕਲ ਦੇ 80 ਅੰਕ ਹੋਣਗੇ)
  2. ਵਿਦਿਆਰਥੀ ਕੋਲੋਂ ਕੰਪਿਊਟਰ ਅਤੇ ਸੂਚਨਾ ਤਕਨਾਲੋਜੀ ਬਾਰੇ ਮੌਖਿਕ ਪ੍ਰਸ਼ਨ ਵੀ ਪੁੱਛੇ ਜਾਣਗੇ। (ਮੌਖਿਕ ਪ੍ਰੀਖਿਆ ਦੇ 20 ਅੰਕ ਹੋਣਗੇ)
- (ੳ). ਪੰਜਾਬੀ ਵਰਡ ਪਰੋਸੈਸਿੰਗ : ਸਿਸਟਮ ਖੋਲ੍ਹਣਾ, ਸਿਸਟਮ ਦੀ ਚੋਣ; ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀ ਚੋਣ; ਅੰਮ੍ਰਿਤ ਲਿਪੀ, ਗੁਰਬਾਣੀ ਲਿਪੀ, ਗੁਰਬਾਣੀ ਕਲਮੀ, ਫਾਇਲ ਬਨਾਉਣੀ, ਸਮਗਰੀ ਦੀ ਪ੍ਰਕਿਰਤੀ ਅਨੁਸਾਰ ਪੰਨੇ ਦੀ ਸੈਟਿੰਗ, ਡਾਇਰੈਕਟਰੀ ਬਨਾਉਣੀ ਅਤੇ ਫਾਇਲ ਨੂੰ ਸੇਵ ਕਰਨਾ।
- (ਅ). ਹਾਰਡ ਡਿਸਕ ਤੋਂ ਫਲੋਪੀ ਜਾਂ/ਅਤੇ ਫਲੋਪੀ ਤੋਂ ਹਾਰਡ ਡਿਸਕ ਉੱਤੇ ਸਮੱਗਰੀ ਤਬਦੀਲ ਕਰਨੀ, ਫੀਡ ਕੀਤੀ ਸਮਗਰੀ ਦਾ ਪ੍ਰੀਵਿਊ ਅਤੇ ਪ੍ਰਿੰਟ ਲੈਣਾ; ਰੀਸੈਟਿੰਗ, ਕੁਰੈਕਸ਼ਨ ਅਤੇ ਡਬਲ ਸਕਰਿਪਟਿੰਗ ਦਾ ਅਭਿਆਸ ਕਰਨਾ, ਫੌਂਟ ਦਾ ਆਕਾਰ ਚੁਣਨਾ, ਫੀਡ ਕੀਤੀ ਸਮਗਰੀ ਦੇ ਭਾਗਾਂ ਨੂੰ ਇਕ ਥਾਂ ਤੋਂ ਦੂਜੀ ਥਾਂ ਲਿਜਾਣਾ ਅਤੇ ਪੈਰਾ ਸੈਟਿੰਗ ਕਰਨਾ।
- (ੲ). ਪੰਜਾਬੀ ਦੀ ਵੈਬਸਾਈਟ ਖੋਲ੍ਹਣਾ, ਪੰਜਾਬੀ ਵਿਚ ਈ.ਮੇਲ ਭੇਜਣ ਦਾ ਅਭਿਆਸ ਕਰਨਾ।

**SANSKRIT (ELECTIVE)**  
**Paper–A (गद्य तथा काव्य)**

**Time : 3 Hours**  
**Teaching–Six Periods per week**

**Max. Marks: 100**

प्रश्न-पत्र का माध्यम हिन्दी होगा। उत्तर संस्कृत/हिन्दी/पंजाबी/अंग्रेजी में हो सकते हैं।

**I. निर्धारित पाठ्यक्रम :**

- |   |        |
|---|--------|
| 1. कादम्बरी (बाण) शुकनासोपदेश, भारतीय विद्याप्रकाशन, दिल्ली, 2003 | 60 अंक |
| 2. श्रीमद् भगवद् गीता –द्वितीय अध्याय                             | 40 अंक |

**II. प्रश्नपत्र निर्माण निर्देश:**

प्रश्न-पत्र के 3 भाग होंगे—

|             |   |        |
|-------------|---|--------|
| प्रथम भाग   | — | 20 अंक |
| द्वितीय भाग | — | 60 अंक |
| तृतीय भाग   | — | 20 अंक |

**1- प्रथम भाग :**

इस में शुकनासोपदेश, भारतीय विद्याप्रकाशन, दिल्ली, 2003 से अति संक्षिप्त उत्तरों के लिए 10 प्रश्न पूछे जायें।  
प्रत्येक के 2 अंक होंगे। 10x2=20 अंक

**2- द्वितीय भाग :**

(क) शुकनासोपदेश से 6 गद्य देकर 3 का सप्रसंग सरलार्थ पूछा जायेगा। प्रत्येक के 10 अंक हैं।  $3 \times 10 = 30$  अंक  
(ख) श्रीमद् भगवद्गीता (द्वितीय अध्याय) से 6 श्लोक देकर 3 की सप्रसंग व्याख्या पूछी जाए। प्रत्येक के 10 अंक हैं।  
3x10=30 अंक

**3- तृतीय भाग :**

(क) शुकनासोपदेश से 2 प्रश्न देकर एक का उत्तर पूछा जाए। इसके 10 अंक होंगे। 1x10=10 अंक  
(ख) श्रीमद्भगवद्गीता से 2 प्रश्न देकर एक का उत्तर पूछा जाए। इसके 10 अंक हैं। 1x10=10 अंक

**III. नोट:—तृतीय भाग के लिए सम्भावित बिन्दु :**

1. शुकनासोपदेश

- (क) शुकनासोपदेश का सार
- (ख) पात्र चित्रण
- (ग) गद्य शैली
- (घ) लक्ष्मी का स्वरूप
- (ङ) शुकनासोपदेश का महत्व
- (च) ग्रन्थाकार का संक्षिप्त परिचय
- (छ) गद्य काव्य की विशेषताएं। ....इत्यादि।

2. श्रीमद्भगवद्गीता (द्वितीय अध्याय)

- (क) सार।
- (ख) कृष्णार्जुन संवाद।
- (ग) सांख्य योग का वर्णन।
- (घ) क्षात्र धर्म।
- (ङ) निष्काम कर्म योग।
- (च) स्थितप्रज्ञ लक्षण।
- (छ) श्रीमद्भगवद् गीता का परिचय। ....इत्यादि।

**SANSKRIT (ELECTIVE)**  
**Paper–B (व्याकरण, साहित्य तथा निबन्ध)**

**Time: 3 Hours**  
**Teaching–Six Periods per week**

**Max. Marks: 100**

प्रश्न-पत्र का माध्यम हिन्दी होगा। उत्तर संस्कृत/हिन्दी/पंजाबी/अंग्रेजी में हो सकते हैं।

**I निर्धारित पाठ्यक्रमः**

- |  |        |
|--|--------|
| 1. विसर्ग सन्धि  | 10 अंक |
| 2. समास (अव्ययीभाव, बहुव्रीहि)   | 10 अंक |
| 3. प्रत्यय (सन्, णिच्, यङ्)  | 10 अंक |
| भू, पठ्, हस्, गम्, पत्, कृ, ग्रह्, दिव्, हा, आप्, क्री, चुर्, सिच्, दृश्, चल् धातुओं के साथ लट् लकार (प्रथम पुरुष, एक वचन) में रूप।  |        |
| 4. अलंकार  | 15 अंक |
| उपमा (पूर्णोपमा), उत्प्रेक्षा (वस्तुत्प्रेक्षा), रूपक (सांग), दृष्टान्त, विभावना, विशेषोक्ति, अर्थान्तरन्यास, अपह्नुति, व्यतिरेक, अनुप्रास, यमक, व्याजस्तुति।                                    |        |
| 5. (क) वैदिक साहित्य   | 15 अंक |
| ऋग्वेद, यजुर्वेद, सामवेद, अथर्ववेद का काल, वर्ण्य विषय तथा शाखायें।  |        |
| (ख)लौकिक साहित्य   | 30 अंक |
| भास, कालिदास, भवभूति, बाणभट्ट, भारवि, तथा माघ की कृतियों का समीक्षात्मक अध्ययन।  |        |
| 6. fucl/k  | 10 अंक |
| संस्कृति भाषाया : महत्त्वम्, मम प्रियः कविः, मम प्रियं पुस्तकम् , आदर्शः छात्रः, पर्यावरणम् (प्रकृतिचित्रणम्), सत्संगतिः विज्ञानस्य चमत्काराः , सत्यमेव जयते दिपावली , यत्र नार्यस्तु पूज्यन्ते। |        |

**II प्रश्न पत्र निर्माण निर्देशः**

प्रश्न पत्र के 3 भाग होंगे—

|             |   |        |
|-------------|---|--------|
| प्रथम भाग   | — | 20 अंक |
| द्वितीय भाग | — | 60 अंक |
| तृतीय भाग   | — | 20 अंक |

**1. प्रथम भाग :**

इसमें विसर्ग सन्धि से सन्धि/सन्धि विच्छेद पर आधारित 5 प्रश्न तथा समासों से समस्त पद का विग्रह व समास-नाम पर आधारित 5 प्रश्न अर्थात् कुल 10 प्रश्न पूछे जायें। प्रत्येक के 2 अंक हैं। 10x2=20 अंक

**2. द्वितीय भागः**

- |   |             |
|---|-------------|
| (क) 5 अलंकार देकर 3 का लक्षण तथा उदाहरण पूछा जाए। प्रत्येक के 5 अंक होंगे।                            | 03x5=15 अंक |
| (ख) वैदिक साहित्य से 2 प्रश्न देकर एक का उत्तर पूछा जाए। इसके 15 अंक हैं।                             | 1x15=15 अंक |
| (ग) लौकिक साहित्य से 6 कृतियां देकर 3 कृतियों का समीक्षात्मक परिचय पूछा जाये। प्रत्येक के 10 अंक हैं। | 3x10=30 अंक |

**3. तृतीय भागः**

(क) निर्धारित धातुओं में से 10 के साथ निर्धारित प्रत्यय देकर 5 का सिद्ध रूप पूछा जाए। प्रत्येक के 2 अंक हैं।

5x2=10 अंक

(ख) निर्धारित विषयों में से 4 देकर एक पर संस्कृति में निबन्ध लिखवाया जाये। इसके 10 अंक हैं।

1x10=10 अंक

**FUNCTIONAL SANSKRIT (VOCATIONAL)**  
**PAPER - I**

**Time: 3 Hours**

**Total Marks: 100**

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

**Section-A:** In this Section 10 question of 2 marks each will be asked. All questions will be compulsory with total weightage of 20 marks.

**Section-B:** In this Section 12 questions will be asked. Candidates will have to attempt 8 questions. Each question will carry 6 marks 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 32 marks.

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1. मसाना बैशिष्टय माहात्मयं च ।
2. तत्रमासे विहितानि कर्माणि ।
  1. चैत्र मासः
  2. बैशाद मासः
  3. जयेष्ठ मासः
  4. आषाढ मासः
  5. श्रावण मासः
  6. भाद्रपद मासः
  7. अश्रुयुज मासः
  8. कार्तिक मासः
  9. मार्गशीर्ष मासः
  10. पुष्य मासः
  11. माघ मासः
  12. फाल्गुन मासः

**FUNCTIONAL SANSKRIT (VOCATIONAL)  
PAPER-II****Time: 3 Hours****Total Marks: 100  
Theory Marks: 84  
Practical Marks: 16****Note:** Question Paper will be divided into three sections:**Section-A:** In this Section 10 question 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. Each question will carry 6 marks 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 16 marks.

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1. मुर्तिप्रतिष्ठापन विधि: ।
2. भारतीययानां जीवने व्रतानां तत्पालनं च ।
3. व्रतानां सामान्य परिचय: ।
4. सत्यनारायणपूजाव्रत विधि: ।
5. गणपति पूजा व्रतानि ।
6. लक्ष्मीपूजा व्रतानि ।
7. सरस्वती पूजा व्रतम ।
8. शिवपूजा व्रतम ।

**HINDI (ELECTIVE)**

पेपर—ए

विशिष्ट कवि, काव्य सिद्धान्त कामकाजी हिन्दी तथा

निबंध लेखन

समय : 3 घण्टे

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 है।

**खण्ड—दो**

इस भाग में 12 प्रश्न पूछे जायेंगे जिनमें 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 है।

**खण्ड—तीन**

इस भाग में चार प्रश्न पूछे जायेंगे जिनमें से दो प्रश्नों का उत्तर देना अनिवार्य है। प्रत्येक प्रश्न का उत्तर पांच पृष्ठों का होगा। प्रत्येक प्रश्न सोलह अंकों का होगा।

कुल 32 अंक हैं।

**निर्धारित पाठ्यक्रम:**

निर्धारित पुस्तक : 'लंका; धर्म, दंष्ट्र \* (Jh ujs'k egrk)

— काव्य सिद्धान्त—काव्य की परिभाषा, तत्त्व, प्रकार, काव्य का स्वरूप, हेतु प्रयोजन आदि।

— दस छन्द : वसन्ततिलका, भुजंगप्रयात, वंशस्थ, मालिनी, इन्द्रवज्रा, दोहा, चौपाई, कवित्त, सोरठा, गीतिका।

— कामकाजी हिन्दी के प्रमुख कार्य: प्रारूपण, संक्षेपण, टिप्पण

**निबंध लेखन : दो परिक्षेत्र**

1. राजभाषा हिन्दी
2. हिन्दी भाषा का कोई सुप्रसिद्ध ग्रंथ अथवा लेखक (आधुनिक युग/काल के संदर्भ में)

**विषयानुसार विभाजन**

1. प्रथम खण्ड में काव्य सिद्धान्तों, छन्दों तथा कवियों सम्बन्धी प्रश्न होंगे।
2. दूसरे खण्ड में 'लंका; धर्म, दंष्ट्र से चार व्याख्याएं होंगी उनमें से दो करनी अनिवार्य होंगी। शेष प्रश्नों में तीन निर्धारित पुस्तक के प्रश्न प्रतिपाद्य, काव्य—सौष्टव आदि पर होंगे। तीन प्रश्न काव्य सिद्धान्तों, छन्दों पर होंगे। दो प्रश्न कामकाजी हिन्दी पर होंगे। प्रत्येक क्षेत्र से कम से कम एक प्रश्न का उत्तर देना अनिवार्य होगा।
3. तृतीय खण्ड में दो-दो विस्तृत प्रश्न निर्धारित पाठ्य पुस्तक तथा निबन्धों पर होंगे जिनमें से केवल एक-एक प्रश्न करना होगा।



**HINDI (ELECTIVE)**

पेपर—बी

**लघु विधायें, रीति, आधुनिक काल तथा शब्दानुवाद**

समय : 3 घण्टे

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 है।

**खण्ड—दो**

इस भाग में 12 प्रश्न पूछे जायेंगे जिनमें 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 जायेंगे जिनमें से दो प्रश्नों का उत्तर देना अनिवार्य है। प्रत्येक प्रश्न का उत्तर पांच पृष्ठों का होगा। प्रत्येक प्रश्न सोलह अंकों का होगा।

कुल 32 अंक हैं।

**निर्धारित पाठ्यक्रम**

- गद्य विविधा : सम्पादक डॉ. विनोद कुमार तनेजा तथा हरीश सूद 'निश्चिंत', प्रकाशक : गुरु नानक देव यूनिवर्सिटी, अमृतसर।
- हिन्दी साहित्य का इतिहास : रीति तथा आधुनिक काल

**अध्ययन के पंद्रह निर्धारित परिक्षेत्र**

- रीतिकाल का नामकरण
- रीतिकालीन काव्य का वर्गीकरण
- रीतिकालीन साहित्य की विशेषताएं
- बिहारी : काव्य सौष्टव
- प्रमुख रीतिबद्ध कवि : केशवादि (सामान्य परिचय)
- रीतिमुक्त कवि : घनानंद आदि (सामान्य परिचय)
- आधुनिक काल गद्य काल के रूप
- भारतेंदु युग : सामान्य परिचय
- द्विवेदी युग : सामान्य परिचय
- छायावाद : प्रमुख कवि तथा काव्यगत विशेषतायें
- प्रगतिवाद : प्रमुख कवि तथा काव्यगत विशेषतायें
- प्रयोगवाद : प्रमुख कवि तथा 'रारसप्तक' का मूल्यांकन
- उपन्यास तथा कहानी विधा का विकास
- हिंदी आलोचना और आचार्य रामचन्द्र शुक्ल
- नई कविता : अभिप्राय और प्रमुख विशेषतायें

**विषयानुसार विभाजन**

1. **प्रथम खण्ड** में तकनीक शब्दावली के दो भाग होंगे। 'क' भाग में दस अंग्रेजी शब्दों का हिन्दी अनुवाद तथा 'ख' भाग में दस हिन्दी शब्दों का अंग्रेजी में अनुवाद करना होगा।

अथवा

इतिहास से संबंधित दस प्रश्न होंगे। प्रत्येक प्रश्न दो अंकों और पांच पंक्तियों/पचास शब्दों का होगा।

2. **दूसरे खण्ड** के प्रथम उपखण्ड से क्रमशः तीन व्याख्याएं, तीन प्रश्न 'गद्य विविधा' से होंगे। दूसरे उपखण्ड में छः प्रश्न होंगे। प्रत्येक उपखण्ड में से चार-चार प्रश्न करने अनिवार्य होंगे।

3. **तीसरे खण्ड** में से दो प्रश्न पाठ्यपुस्तक तथा दो इतिहास से होंगे। दो प्रश्नों में से एक-एक प्रश्न करना अनिवार्य है।

**क) अंग्रेजी से हिन्दी**

|                                 |                             |
|---------------------------------|-----------------------------|
| 1. Accuse                       | अभियोग लगाना                |
| 2. Advertisement                | विज्ञापन                    |
| 3. Alphabetic Order             | वर्णानुक्रमिक श्रेणी, कोटि  |
| 4. Appendix                     | परिशिष्ट                    |
| 5. Annual Administrative Report | वार्षिक प्रशासकीय रपट       |
| 6. Assistant Superintendent     | सहायक अधीक्षक               |
| 7. Attestation                  | साक्ष्यकन, प्रमाणीकरण       |
| 8. Bonafide                     | सद्भावी, वास्तविक           |
| 9. Bacteriology                 | जीवाणु विज्ञान              |
| 10. Bail                        | जमानत, जामिन, प्रतिम्       |
| 11. Boundary                    | परिसीमा, सीमा, सीमांत       |
| 12. Certificate of fitness      | आरोग्यापत्र                 |
| 13. Circular                    | परिपत्र, गश्ती चिट्ठी       |
| 14. Commission                  | आयोग, कमीशन, दलाली, आदत     |
| 15. Contingencies               | आकस्मि व्यय                 |
| 16. Custody                     | अभिरक्षा                    |
| 17. Decentralisation            | विकेन्द्रीयकरण              |
| 18. Defendent                   | प्रतिवादी                   |
| 19. Deputation                  | शिष्टमंडल                   |
| 20. Discretion                  | विवेकाधिकार                 |
| 21. Emolument                   | उपलब्धि, पारिश्रमिक, परिलाभ |
| 22. Electrical Engineer         | विद्युत अभियन्ता            |
| 23. Faculty                     | संकाय                       |
| 24. Finance Committee           | वित्त समिति                 |

|                       |                              |
|-----------------------|------------------------------|
| 25. Foreign Currency  | विदेशी मुद्रा                |
| 26. Gazetted Post     | राजपत्रित पद                 |
| 27. Grant             | अनुदान                       |
| 28. Geological Survey | भूविज्ञान सर्वेक्षण          |
| 29. Guardianship      | संरक्षण                      |
| 30. Honorary          | अवैतनिक, मानद                |
| 31. Head Quarter      | मुख्य केन्द्र, मुख्यालय      |
| 32. Hydrological data | जलविज्ञान संबंधी बाते        |
| 33. Identity Card     | पहचान पत्र                   |
| 34. Insignificant     | उपेक्ष्य, तुच्छ              |
| 35. Judicial          | अदालती, न्यायिक              |
| 36. Kinetise          | गति सम्बन्धी                 |
| 37. Ledger            | खाता                         |
| 38. Monopoly          | एकाधिकार                     |
| 39. Nationalization   | राष्ट्रीयकरण                 |
| 40. Offender          | अपराधी                       |
| 41. Proceedings       | कार्यवाही                    |
| 42. Quoram            | गणपूर्ति                     |
| 43. Reservation       | आरक्षण                       |
| 44. Subordinate       | अधीनस्थ                      |
| 45. Transfer          | स्थानांतरण                   |
| 46. Unclassified      | अवर्गीकृत                    |
| 47. Vacancy           | रिक्त                        |
| 48. Validity          | वैधता, मान्यता               |
| 49. Warrant           | वारंट/अधिपत्र                |
| 50. Zonal             | क्षेत्रीय, प्रादेशिक, मंडलीय |

ख) हिन्दी से अंग्रेजी

|                      |                           |
|----------------------|---------------------------|
| 1. अग्रिमता          | Priority Involuntary      |
| Unoptional           |                           |
| 2. अनैच्छिक          | Unintentional             |
| 3. अर्थशास्त्री      | Economist                 |
| 4. सीमा-शुल्क/सीमाकर | Custom Duty               |
| 5. इकाई              | Unit                      |
| 6. उत्तराधिकार       | Inheritance, Succession   |
| 7. उन्मूलन           | Abolition                 |
| 8. उपर उद्धृत        | Above noted, above quoted |

|                        |                                       |
|------------------------|---------------------------------------|
| 9. एकरूपता/सारूप्यता   | Uniformity, Identity                  |
| 10. औपनिवेशिक          | Colonial, Dominion                    |
| 11. कर्मचारी तंत्र     | Bureaucracy                           |
| 12. ग्रंथ सूची         | Bibliography                          |
| 13. गणनीय              | Computable, Calculable,<br>Enumerable |
| 14. घटक<br>factor      | Component, Constituent,               |
| 15. घोषणापत्र          | Manifesto, Proclamation               |
| 16. चिकित्सक           | Doctor, Physician                     |
| 17. छात्रावास          | Boarding House/Hostel                 |
| 18. जन सम्पर्क         | Public Relation                       |
| 19. टंकण               | Type Writing                          |
| 20. टीकाकार            | Interpreter, Annotator                |
| 21. दण्ड संहिता        | Penal Code                            |
| 22. द्विभाषिक          | Bilingual                             |
| 23. धन विनियोग         | Investment                            |
| 24. नगर निगम           | Corporation                           |
| 25. नैमित्तिक व्यय     | Contingency                           |
| 26. पृथक्करण           | Separation                            |
| 27. प्रधान कार्यालय    | Head Quarter                          |
| 28. पत्र व्यवहार       | Correspondence                        |
| 29. पदाधिकारी          | Office Bearer                         |
| 30. परिषद्             | Council/Board                         |
| 31. भरण-पोषण           | Maintenance                           |
| 32. मरणोत्तर           | Posthumous                            |
| 33. यथार्थता/विशुद्धता | Accuracy                              |
| 34. यांत्रिक           | Mechanical                            |
| 35. राष्ट्रीयता        | Nationality                           |
| 36. लोकतंत्रात्मक      | Democratic                            |
| 37. विकेन्द्रीकरण      | Decentralisation                      |
| 38. वैज्ञानिक          | Scientist                             |
| 39. व्यायामशाला        | Gymnasium                             |
| 40. शपथपत्र            | Affidavit                             |
| 41. शरणार्थी           | Refuges                               |
| 42. श्रेष्ठ            | Superior                              |

|     |                     |                                     |
|-----|---------------------|-------------------------------------|
| 43. | संरक्षण             | Safeguard, Protection               |
| 44. | सारिणी              | Table                               |
| 45. | स्वीकृत             | Accepted, Recognised,<br>Sanctioned |
| 46. | संशोधन              | Modification, Amendment             |
| 47. | सभा-भवन             | Assembly Hall, Chamber              |
| 48. | सार्वजनिक स्वास्थ्य | Public Health                       |
| 49. | स्थानीय             | Local                               |
| 50. | हस्तकला शिक्षण      | Manual Training                     |

## फंक्शनल हिन्दी

## पेपर—एक

## हिन्दी में टंकण, टेलैक्स कंप्यूटर और प्रसारण

समय : तीन घण्टे

पूर्णांक : 100

नोट :—

- क) यह प्रश्नपत्र चार भागों में बंटा हुआ है। पहले भाग में भाग 1,2,4 में से दस प्रश्न पूछे जाएंगे। इस भाग के सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न 2 अंकों का है। कुल अंक 20
- ख) इस भाग में 1, 2, 4 से बारह प्रश्न पूछे जाएंगे जिनमें से आठ प्रश्नों का उत्तर देना है। इन प्रश्नों का उत्तर दो पृष्ठों में देना होगा अथवा दो सौ शब्दों तक की सीमा का होगा। प्रत्येक प्रश्न के 6 अंक हैं। कुल अंक 48
- ग) इस भाग में तीन से चार प्रश्न पूछे जाएंगे जिनमें से दो प्रश्नों का उत्तर देना अनिवार्य है। जिनमें से दो प्रश्नों का उत्तर पांच पृष्ठों अथवा एक हजार शब्दों तक सीमित होगा। प्रत्येक प्रश्न 16 अंकों का होगा। कुल अंक 32

## भाग—एक:

टंकण, टेलैक्स और हिन्दी में कंप्यूटर प्रोग्रामिंग

## क) सिद्धान्त

- संक्षिप्त परिचय
- टंकण/आशुलिपि कंप्यूटर प्रचलन की बढ़ रही मांग
- कंप्यूटर प्रोग्राम : परिचय
- आंकड़ा/आधार सामग्री (डाटा) प्रवेश
- प्रोग्रामिंग (मूल)

## भाग—दो :

प्रसारण: रेडियों और दूरदर्शन (ब्रॉडकास्टिंग: रेडियों एण्ड टेलीविजन)

## क) सिद्धान्त

- प्रसारण के मूलभूत सिद्धान्त
- रेडियो/टेलीविजन संचार के माध्यम
- रेडियों/टेलीविजन का भारत में जालतंत्र (नेटवर्क)
- शैक्षणिक रेडियो और टेलीविजन: प्रचलित विषय और सामान्य ज्ञान

## भाग—तीन

हिन्दी साहित्य के रीतिकाल तथा आधुनिक काल की विशेषताएं

## भाग—चार : प्रयोग

- आवाज/ध्वनि प्रशिक्षण
- रेडियो/टेलीविजन पर प्रसारण की विधि
- कैमरे का सामना (फेस) करने का प्रशिक्षण

## संदर्भ पुस्तकें:

- प्रयोजनमूलक हिन्दी: विविध परिदृश्य, डॉ. रमेश चन्द्र त्रिपाठी, डॉ. पवन अग्रवाल, अलका प्रकाशन, कानपुर 2001,
- आकाशवाणी, रामबिहारी विश्वकर्म, प्रकाशन विभाग, सूचना और प्रसारण मंत्रालय, भारत सरकार।
- कम्प्यूटर और हिन्दी, डॉ. हरिमोहन, तक्षशिला प्रकाशन, नई दिल्ली, 2002.
- रेडियो और दूरदर्शन, डॉ. हरिमोहन, तक्षशिला प्रकाशन, नई दिल्ली, 1997.
- कम्प्यूटर और सूचना तकनीक, शंकर सिंह, पूर्वांचल प्रकाशन, दिल्ली, 2000.

**फंक्शनल हिन्दी**  
**पेपर—दो**  
**कोश विज्ञान और विज्ञापन**

समय : 3 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। द्य वद 20
- 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 छः अंक का है। द्य वद 48
- 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। द्य वद 32

**निर्धारित पाठ्यक्रम**

क) हिन्दी का शब्द भंडार : तत्सम, तद्भव, देशज, विदेशी या आगत, संकर शब्द

**ख) कोशविज्ञान**

- कोशविज्ञान : अर्थ, परिभाषा, स्वरूप और उपयोगिता
- कोश : विभिन्न प्रकार
- कोश—निर्माण : सिद्धान्त और विविध सोपान
- हिन्दी कोश परम्परा
- कोश—निर्माण : समस्याएँ

**ग) विज्ञापन**

- विज्ञापन : अर्थ, परिभाषा और स्वरूप
- विज्ञापन : ऐतिहासिक परिप्रेक्ष्य
- विज्ञापन : विभिन्न प्रकार
- विज्ञापन के तत्व : आकर्षण, मनोविज्ञान, सौन्दर्य, नाटकीयता और संगीतात्मकता
- विज्ञापनों में लिप्यंतरण
- विज्ञापनों की भूमिका और महत्त्व

**अंक विभाजन :**

- प्रथम खंड में 'क' 'हिन्दी का शब्द भंडार' में से दस प्रश्न पूछे जाएंगे। अंक : 2X10= 20
- द्वितीय खंड में भाग 'ख' और भाग 'ग' से प्रश्न पूछे जाएंगे। अंक : 6X8= 48
- तृतीय खंड में भाग 'ख' और 'ग' में से प्रश्न पूछे जाएंगे। अंक : 2X16= 32

**नोट :** पाठ्यक्रम में निर्धारित 'हिन्दी शब्द—भंडार' की सूची साथ संलग्न है।

## निर्धारित पाठ्यक्रम

## हिन्दी का शब्द-भंडार

| संस्कृत शब्द | हिन्दी शब्द  | संस्कृत शब्द | हिन्दी शब्द  |              |              |
|--------------|--------------|--------------|--------------|--------------|--------------|
| अक्षर        | अक्षर        | अग्नि        | अग्नि        |              |              |
| अरुण         | अरुण         | अश्विनी      | अश्विनी      |              |              |
| अहंकार       | अहंकार       | अश्रु        | अश्रु        |              |              |
| उत्तर        | उत्तर        | आत्मा        | आत्मा        |              |              |
| कक्ष         | कक्ष         | कक्षा        | कक्षा        |              |              |
| कथा          | कथा          | कण्ठ         | कण्ठ         |              |              |
| कृष्ण        | कृष्ण        | कृषि         | कृषि         |              |              |
| क्रोध        | क्रोध        | ग्रीष्म      | ग्रीष्म      |              |              |
| गोत्र        | गोत्र        | घोर          | घोर          |              |              |
| चरण          | चरण          | जाति         | जाति         |              |              |
| धर्म         | धर्म         | दक्षिण       | दक्षिण       |              |              |
| पृथ्वी       | पृथ्वी       | प्रजा        | प्रजा        |              |              |
| पूर्व        | पूर्व        | पुष्प        | पुष्प        |              |              |
| पुण्य        | पुण्य        | मित्र        | मित्र        |              |              |
| पशु          | पशु          | मंत्री       | मंत्री       |              |              |
| मृत्यु       | मृत्यु       | रस           | रस           |              |              |
| रात्रि       | रात्रि       | रक्त         | रक्त         |              |              |
| युवा         | युवा         | वृद्ध        | वृद्ध        |              |              |
| वर्ण         | वर्ण         | सेना         | सेना         |              |              |
| सूर्य        | सूर्य        | सम्राट       | सम्राट       |              |              |
| समर          | समर          | हल           | हल           |              |              |
| <b>तत्सम</b> | <b>तद्भव</b> | <b>तत्सम</b> | <b>तद्भव</b> | <b>तत्सम</b> | <b>तद्भव</b> |
| अग्नि        | आग           | अंगुली       | उंगली        | —            | —            |
| अंध          | अंधा         | अंगरक्षक     | अंगरखा       | अंतःपुट      | अंदर         |
| अग्र         | आगे          | अद्य         | आज           | अज्ञान       | अनजान        |
| अंचल         | आंचल         | अंत्र        | आँत          | अन्यत्र      | अनत          |
| अंगुष्ठ      | अंगूठा       | अमृत         | अमिय         | अक्षि        | अनत          |
| अंगुष्ठ      | अंगूठा       | अमृत         | अमिय         | अक्षि        | आँख          |
| अश्रु        | आँसू         | अगम्य        | अगम          | अगणित        | अनगणित       |
| आम्र         | आम           | आश्रय        | आसरा         | आश्चर्य      | अचरज         |
| आभीर         | अहीर         | आलस्य        | आसरा         | आश्विन       | आसिन         |



|             |           |         |        |          |        |
|-------------|-----------|---------|--------|----------|--------|
| आमलक        | आँवला     | इक्षु   | ईख     | इष्टिका  | ईट     |
| उलकू        | उल्लू     | उष्ट्र  | ऊटँ    | उच्च     | ऊचँ।   |
| उत्सम       | ऊमस       | एकादश   | ग्यारह | ओष्ठ     | ओठ     |
| कंकण        | कंगन      | कर्ण    | कान    | कर्म     | काम    |
| काक         | कौआ       | कर्पूर  | कपूर   | कटुक     | कड़वा  |
| कृष्ण       | कान्हा    | कार्य   | काज    | काष्ठ    | काठ    |
| कपाट        | किवाड     | कथावत   | कहावत  | कर्त्तनी | कतरनी  |
| कुम्भकार    | कुम्हार   | कंटक    | काँटा  | कुटी     | कुटिया |
| कुठार       | कुल्हाड़ी | कूप     | कुआँ   | खर्जूर   | खजूर   |
| खट्वामल     | खटमल      | गर्जर   | गाजर   | ग्राम    | गाँव   |
| गर्दभ       | गदहा      | गर्जन   | गरजना  | गमन      | गौना   |
| गायक        | गवैया     | गैरिक   | गरु    | गौर      | गोरा   |
| गृध         | गीद्ध     | गोमल    | गोबर   | घट       | घड़ा   |
| घृत         | घी        | घोटक    | घोड़ा  | चचुं     | चाचें  |
| चैत्र       | चतै       | चर्म    | चमडा   | चर्मकार  | चमार   |
| चतुष्पादिका | चौकी      | छत्रक   | छाता   | छत्र     | छतरी   |
| छिद्र       | छदे       | ज्येष्ठ | जठे    | जंघा     | जाँघ   |
| जिह्वा      | जीभ       | जुष्ट   | जूठा   | तृण      | तिनका  |
| ताम्र       | ताम्बा    | त्वरित  | तुरन्त | तिक्त    | तीता   |
| दतं         | दातँ      | दधि     | दही    | दुग्ध    | दधू    |
| दीपक        | दीया      | दण्ड    | डंडा   | दक्षिण   | दाहिना |
| धृष्ट       | ठीठ       | धन्य    | धान    | धनका     | धनिया  |
| नग्न        | नगां      | नव      | नया    | नृत्य    | नाच    |
| निम्ब       | नीम       | नक्र    | नाक    | नापित    | नाई    |
| नारिकेल     | नारियल    | निष्ठुर | निठुर  | पंच      | पाँच   |
| पत्र        | पत्ता     | प्रभूत  | नहुत   | पक्वान्न | पकवान  |
| पर्यंक      | पलंग      | पक्षी   | पंछी   | पुष्कर   | पोखर   |
| पर्ण        | पान       | पाद     | पाँव   | पुत्र    | पूत    |
| प्रस्तर     | पत्थर     | प्रहर   | पहर    | पिप्पल   | पीपल   |
| पृष्ठ       | पीठ       | वंध्य   | बाँझ   | बर्कर    | बकरा   |
| बिंदु       | बूँद      | बिल्व   | बेल    | भक्त     | भगत    |
| भगिनी       | बहन       | भिक्षा  | भीख    | भद्रक    | भला    |
| भंडारण      | भंडार     | भल्लकू  | भालू   | भ्रमर    | भँवरा  |
| भ्राता      | भाई       | मित्र   | मित    | मधूक     | महुआ   |

|         |        |          |        |           |         |
|---------|--------|----------|--------|-----------|---------|
| मयूर    | मोर    | मक्षिका  | मकखी   | महिषी     | भैंस    |
| मस्तक   | माथा   | मातुल    | मामा   | मातृत     | माता    |
| माणिक्य | मानिक  | मुक्ता   | मोती   | मुख्य     | मुखिया  |
| मुष्टि  | मुट्ठी | मृत्यु   | मौत    | महार्घ    | महँगा   |
| मुख     | मुँह   | मेघ      | मेह    | मृत्तिका  | मिट्ठी  |
| याचक    | जाचक   | मिष्ठ    | मीठा   | युवन्     | जवान    |
| यष्टि   | लाठी   | योद्धा   | जोधा   | यव        | जौ      |
| रात्रि  | रात    | राज्ञी   | रानी   | रुक्ष     | रुखा    |
| लक्ष्य  | लाख    | लोक      | लोग    | लोहकार    | लोहार   |
| लौह     | लोहा   | लिंगपट्ट | लंगोटा | लोमशा     | लोमड़ी  |
| वर्ष    | बरस    | वर्षा    | बरसा   | व्याख्यान | बखन     |
| वात     | व्यार  | वधू      | बहू    | वानर      | बंदर    |
| वाष्प   | भाप    | वृद्ध    | बूढ़ा  | वत्स      | बछड़ा   |
| वणिक    | बनिया  | वामन     | बौना   | वार्ता    | बात     |
| वैर     | बैर    | शाक      | साग    | शर्करा    | शक्कर   |
| शय्या   | सेज    | शत       | सौ     | शकुन      | सगुन    |
| शकट     | छकडा   | शलाका    | सलाई   | शिम्बा    | सेम     |
| शवास    | साँस   | शुष्क    | सूखा   | शप्तशती   | सतसई    |
| शिक्षा  | सीख    | शृगाल    | सियार  | श्यामल    | साँवला  |
| सत्य    | सच     | सप्त     | सात    | सर्प      | साँप    |
| सर्व    | सब     | सर्षप    | सरसों  | संध्या    | साँझ    |
| स्कंध   | खम्भ   | सौभाग्य  | सुहाग  | सूची      | सुई     |
| सुत्र   | सतू    | सूर्य    | सूरज   | स्नहे     | नेह     |
| स्वर    | सुर    | षट्      | छह     | षष्ठी     | छठी     |
| षण्ड    | साँड़  | षोडश     | सोलह   | हस्त      | हाथ     |
| हरित    | हरा    | हरिण     | हिरन   | हस्ती     | हाथी    |
| हृदय    | हिय    | हरिद्रा  | हल्दी  | क्षण      | छिन, छन |
| क्षीर   | खीर    | क्षुर    | खूर    | क्षुरिका  | छुरी    |
| क्षेत्र | खेत    | त्रुट    | टटू    | त्रिंशत   | तीस     |

## (ग) देशज शब्द

अक्खड़, अटपटा, अलबेला, अण्टा, आहट, उमंग, ऊटपटांग, ओझल, औढर, औचक, कनकट, करार, कूड़ा, कटरा, कटोरा खहर, खुरदरा, खखरी, खिड़की, खिचड़ी, खूँटी, खुराट, खूसट, खोखला, गली, गिरगिट, गुदड़ी, गोद, गोंद, घेघा, घमंड, घोंसला, चट्टान, चकमा, चप्पल, चींटी, चुड़ैल, चहल, चुनरी, चौका, चिन्दी, चसक, छलॉंग, छीछालेदर, जुगनू, झिझक, झिड़की, झक्की, झुमका, झरोखा, टपरा, टीमटाम, टेसूठर्रा, ठेस, डाबर, ढिबरी, डेरा, तसला, तेंदुआ, टट्टी, घाक, पगड़ी, पेट, बीहड़, बौड़म, भौंचक्का, झाड़ू, माँद, रेबड़ी, सिलवट, झोला, हेकड़ी, आदि ।

## (घ) विदेशी या आगत शब्द

1. **अरबी शब्द** : अदा, अमीर, अदावत, असर, अकल, अल्ला, आखिर, आदत, अहमक, आदमी, इनाम, ईमान, इज्जत, इस्तीफा, इमारत, उम्र, उम्दा, एहसान, औलाद, औरत, कसर, कसूर, कब, कदम, किस्सा, कमाल, कर्ज कसरत, कसम, कीमत, किला, किस्मत, किताब, कुर्सी, खत, खत्म, ख्याल, खबर, खराब, गरीब, जिस्म, जलसा, जलूस, जनाब, जहाज, जिक्र, जवाहर, जालिम, तमाम, तमाशा, तकिया, तकदीर, तजुरबा, तरक्की, दफ्तर, दवा, दावात, दुआ, दगा, दिमाग, दौलत, दुनिया, दुकान, नश, नतीजा, नकद, फकीर, फिक्र, फायदा, बाकी, बहस, माल, मदद, मरज़ी, मरबूर, मुल्क, मौका, मुसाफिर, मतलब, मौसम, लायक, लिफाफा, लिहाज, शराब, हराम, हिसाब, हमला, हक, हाकिम, हुक्म, हाल, हाजिर, हौसला आदि ।
2. **फारसी शब्द** : अदा, अंगूर, अफसोस, अनार, अंजीर, आफत, आवाज, उम्मीद, ईमानदार, इत्र, किशमिश, कबूतर, कुश्ती, खुश, खामोश, खरगोश, गल्ला, गवाह, गिरह, गरम, गोश्त, गुलाब, चश्मा, चादर, चाबुक, चेहरा, चिराग, जादू, जिंदगी, जहर, जोश, जुरमाना, जागीर, ताजा, दीवार, दिल दंगल, नापाक, पजामा परवाह, पर्दा, पुल, बेहूदा, मुर्गा, मोर्चा, रंग, लगाम, वरना, वापस, शेर, शादी, सरकार, सैदागर, सितारा, हफ्ता, हजार इत्यादि ।
3. **तुर्की शब्द** : आका, आगा, उजबक, ऊर्दू, कालीन, काबू, कुर्की, कुली, कैची, चमचा, चकमक, चाकू, चारवाई, चिक, चोंगा, चुगल, जाजिम, तमगा, तुरूक, तोप, बहादुर, बीवी, बुलबुल, बेगम, दारोगा, लफंगा, लाश, सुराग, सौगात, मुगल इत्यादि ।
4. **पश्तो शब्द** : अटकल, अखरोट, गड़बड़, गुंडा, जमालगोटा, नगाड़ा, पठान, पटाखा, भड़ास, मटरगश्ती, रूहेला, लुच्चा, इत्यादि ।
5. **पुर्तगाली शब्द** : अँचार, अनन्नास, आलपीन, आलमारी, आया, इस्तरी, कनस्तर, कप्तान, कमरा, कोको, गमला, गिरिजा, गोदाम, किरानी, चाबी, क्रिस्तान, गोभी, तौलिया, तंम्बाकू, कमीज, नीलाम, परात, पादरी, पिस्तौल, पावरोटी, फर्मा, फीता, बाल्टी, बुताम, मेज, मस्तूल, लबादा, साया, साबुन इत्यादि ।
6. **फ्रांसीसी शब्द** : अंग्रेज़ी, अंग्रेज़ कूपन, कारतूस, काजू ।
7. **जर्मन शब्द** : किंडर गार्डन, ब्लिट्ज, नात्सी ।
8. **डच शब्द** : तुरूप, ड्रिल, स्काउट, बम ।
9. **चीनी शब्द** : तूफान, चाय, पटाखा, लीची ।
10. **जापानी शब्द** : रिक्सा ।
11. **लैटिन शब्द** : अक्टूबर, नवंबर, इत्पताल, इंच, एजेंडा, कोरम, कोटा, पेंशन, मशाल, स्कूल, रेडियो, राशन इत्यादि ।

12. **यूनानी शब्द** : होड़ा-चक्र, ऐटम, एटलस, एकेडेमी, टेलीग्राफ, बइबिल इत्यादि ।
13. **अंग्रेज़ी शब्द** : अप्रैल, अगस्त, अक्टूबर, अफसर, अपील, अस्पताल, ऑफिस, ऑर्डर, इंजिन, इंजीनियर, एजेंट, एडवांस, कम्पनी, कमीशन, कॉलेज, कलेंडर, कमेटी, कांग्रेस, कालर, कार, मोटर, टैक्सी, टेबुल, टिकट, टेनिस, क्रिकेट, हॉफी, क्रीम, कर्नल, मेजर, चेक, कार्ड, प्लेट, गिलास, पेन, पंप, स्लेट, मशीन, रेडियो, लीटर, मीटर, नट, बोल्ट, बिस्कुट, बैटरी, ब्रेक, टॉफी, कोट, पैंट, पाउडर, डॉक्टर, प्रोफेसर, कंपाउंडर इत्यादि ।

**(ड) संकर शब्द**

हिन्दी और संस्कृत-कपड़ा-उद्योग, पूँजीपति, माँग-पत्र, वर्षगाँठ ।

हिन्दी और अंग्रेज़ी-सिनेमाघर, मालगोदाम, टिकटघर, रेलगाड़ी ।

हिन्दी और अरबी/फारसी-थानेदार, किताबघर, घड़ीसाज, बैठकसाज, जेब-कट, बेडौल इत्यादि ।

संस्कृत और अंग्रेज़ी-रेलयात्री, रेडियो-तरंग, योजना-कमीशन ।

अंग्रेज़ी और अरबी/फारसी-पार्टीबाजी, अफसरशाही, बीमापॉलिसी, जेलखाना, सील-बंद ।

संस्कृत और फारसी-छायादार, लोकशाही, विज्ञापनबाजी ।

**RUSSIAN  
PAPER - I**

**Time: 3 Hours**

**Max. Marks: 100**

**Paper (Written)**

- |   |          |
|---|----------|
| 1. Grammar from textbook                | 60 Marks |
| 2. Composition (one out of four topics) | 20 Marks |
| 3. Comprehension (Text with questions)  | 20 Marks |

Courses of Reading & Prescribed Text-Book:

-**"RUSSIAN"**–by Wagner V.N. & Ovsienko Y.G. (Lessons 1 to 62), 1991.

-Revision of all cases in singular & plural (nouns, adjectives & pronouns).

-Aspects of verbs.

-Verbs of motion with & without prefixes.

-The relative pronoun „ который”, its declension & usage.

-Participles & participle constructions.

-Short form of the past participle.

-Active & passive voice.

-Direct & indirect speech.

-Gerund.

**Composition Topics:** Моя семья, Немного о себе, Выходной день, Каникулы, Любимый писатель, Почему я изучаю русский язык, Мой преподаватель.

**RUSSIAN  
PAPER-II**

**Time: 3 Hrs.****Max. Marks: 100****Part-A (Written)****Marks: 50**

- |   |    |
|---|----|
| 1. Translation from Russian into English/Hindi/Panjabi.   | 15 |
| 2. Translation from English to Russian.   | 15 |
| 3. Literature (two out of five simple questions on characters, themes and ideas of literary works read) | 20 |

Course of Reading & Prescribed Text-Book:

"RUSSIAN"–by Wagner V.N. & Ovsienko Y.G. (Lessons 1 to 62), PPH, N.D., 1991.

**Note:-** Dictionaries are allowed in Paper-II.

**Literature:**

- “ Я вас любил” -Pushkin
- “ Парус” -Lermontov
- “ После Вала” -Л. Tolstoy
- “ Голубое и зелёное” -Ю. Казаков
- “ Смерть чиновника” -А.П.Чехов
- “ История одной жизни” -Чингиз Айтматов
- “ Пеле” -М. Горький

**Prescribed Text-Book :**

"RUSSIAN"–by Wagner V.N. & Ovsienko Y.G. (Lessons 1 to 62), PPH, New Delhi, 1991.

**Part-B: (Oral)/Practical:****Marks: 50**

- |                                       |    |
|---------------------------------------|----|
| -Retelling of text                    | 15 |
| -Conversation                         | 20 |
| -Retelling of a small text in Russian | 15 |

(Besides general talks in includes questions on the prescribed text of Q.1)

**FRENCH****Paper-A****Time: 3 Hours****Max. Marks: 100****Paper-I (Written):****(Composition, Grammar, Translation & Comprehension)**

|  |    |
|--|----|
| i) A composition of around 200 words from the given topics (one out of four)         | 20 |
| ii) Translation English to French  | 10 |
| iii) Translation French to English   | 10 |
| iv) Question on applied grammar pertaining to the text (Exercises from the textbook) | 40 |
| v) Civilization pertaining to the text   | 10 |
| vi) An unseen comprehension passage  | 10 |

**Course of Reading & Prescribed Text-Book:**

"CONNEXIONS-3" by Regine Merieux &amp; Yves Loiseau, Published by Didier, 2004

**Composition Topics:**

- La vie en ville/au village
- La France
- Mon pays
- La cuisine
- Un pique nique au board de la mer
- Mon acteur/actrice/ecrivain favori
- Mes reves
- Un voyage
- La vie au xxi siecle
- L'influence de la television/redio/presse ecrite sure les jeune
- Le mariage-est-ce que c'est une institution, essentielle?
- L'amour ou l'argent
- Si J'etials....., je....
- Les Souveniers de mon enfance
- Les vacances en Inde

**FRENCH**  
**Paper-II**

**Max. Marks: 100**

**Written: 60**

**Viva: 40**

**Part-A: (Written Introduction to French Literature)**

**Time: 3 Hrs.**

**Marks: 60**

**Instructions:**

1. Two questions are to be set from each section. Students shall attempt one out of the two for fifteen marks each. **(45 marks)**.
2. One objective compulsory question (in the form of fill in the blanks or multiple choimces) is to be set from the syllabus mentioned above. **(15 marks)**.

**Section–A: Brief Biography, Philosophy & main works of the following writers:**

- Montesquteu
- Albert Camus
- Maupassant
- Simone de Beauveur

**Section–B: Poetry**

- Le point Mirabeau (Apollinaire)
- L'Albators (Baudelaire)
- Le Jeune veuve (Jean De La Fontaine)
- Familiale (Jeccque Prevert)

**Section–C: Short Stories**

- Le Papa de Simon (Maupassant)
- Le Chevalier Double (Theophile Gautier)

**Reference Books:**

1. Histoire de la Literature Francaise lagarde et Micharde.
2. Histoire de Literature Francaise xix et xx siecle castex et surer.
3. Modern French Course-Mathurin Dondo.
4. Landmarks in French literature, Lytton Strachy.
5. Precis d' Histoire de la literature Francaise (Didier).
6. A Literary History of France, the 20th Century (P.E. Charvet.)

**Prescribed Text-Books:**

"CONNEXIONS-3" by Regine Merieus & Yves Loiseu, 2004, Published by Didier

**Part-B: (Oral)/VIVA**

- Reading of a text
- Dictation
- Conversation

**M. Marks: 40**

**Marks: 10**

**Marks: 10**

**Marks: 20**

Course of Reading & Prescribed Text-Book:

"CONNEXIONS-3" by Regine Merieus & Yves Loiseu, Published by Didiers, 2004.



**URDU  
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 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 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) Poetry**

Study of Urdu poetry with special reference to the modern period.

General information about the Modern period; the circumstances which lead to the vital changes in literary attitudes & different shades of Urdu poetry which came up in Urdu after Mirza Daagh Dehlvi. Questions on trends like Quami Shairi, Taraqqi Pasand Shairi & Jadeed Shairi.

Introductory information about latest forms of poetry Ghazal, Aazad Ghazal, Paaband Nazm and Doha.

**(b) Prose**

Study of Urdu Prose with special reference to modern fiction: Extensive study of Urdu prose.

General information which leads to vital changes in literary attitudes and different forms of prose which came up in Urdu in Munshi Prem Chand and Post Prem Chand period. Introductory information about latest forms of prose: Afsana, Novel, Inshaiya, Khutoot-nigari, Reportaz.

Question on modern trends of prose writing like Tajreed Afsana, Inshaiya Nigari, Social-Satire.

**Book Prescribed:**

Shaoor-e-Adab, published by Maktaba Jamia Ltd., New Delhi.

**URDU**  
**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 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**.

1. Study of short story: Summary and idea

2. History of Urdu literature

Urdu Ki Ibtida Aur Irtiqā

Urdu ka Ahd-e-Zareen, with special reference to the following:-

Zauq, Ghalib, Momin and Zafar

Urdu Sha'iri Ke Naye Rujhanat with special reference to the following poets: Azad, Hali, Chakbast and Iqbal Taraqqi Pasand Tehrik Aur Urdu Sha'iri with special reference to the following poets: Majaz, Faiz, Ali Sardar Jafri and Jazbi Urdu Nasr Ka Irtiqā Aur Fort William College

Urdu Nasr Ka Ahd-e-Zareen with special reference to the following:

Sir Syed Ahmed Khan, Shibli Naumani and Hali Modern Urdu Fiction:

General information about the contribution of: Krishan Chander, Rajinder Singh Bedi, Qurratul Ain Haider and Ismat Chughtai and Kanhiya Lal Kapoor.

**Media and Information:**

(News, Column, Editorial and Internet–Basic information).

**Book Prescribed:**

1. Urdu Ke Terah Afsane, Educational Book House, AMU Market, Aligarh-202002.

**Books Recommended:**

1. Mukhtsar Tarikh-e-Adab-e-Urdu by Syed Ejaz Hussain, Educational Book House, AMU Market, Aligarh-202002 (UP).

2. Tarikh Adab Urdu by Ram Babu Saxena, Educational Book House, AMU Market, Aligarh-202002 (UP).

3. Urdu Adab Ki Tarikh by Azeem-ul-Haq Junaidi, Educational Book House, AMU Market, Aligarh-202002 (UP)-2000.

4. Urdu Sahafat by Anwar Dehlvi, Urdu Academy, Delhi.

5. Urdu Zaban-o-Adab ka Khaka by Khushhal Zaidi, Edara Bazme Khizre Rah, 80-Ghaffar Manzil Jamianagar, New Delhi-110025.

**PERSIAN**  
**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 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 and Poetry**

**Prose**

Selections from *Intkhab Adabiyat-e-Farsi* by Syed Hasan, Arun Kumar Beni Madho, 2, Katra Road, Allahabad-211002.

1. Akhlaq-e-Mohsini: Adab, Ulve Himmat, Sakhavat-o-Ahsan (Pages from 34 to 41).
2. Tarikh-e-Firoz Shahi (Pages from 17 to 23).

Selections from *Nisab-e-Jadid-e-Farsi* published by Jyed Press, Balli Maran, Delhi.

1. Zindagi-e-Man: Bab Kodaki (Pages from 5 to 19).
2. Sarzameen-e-Hind Zaban-e-Farsi Dar Hind (Pages from 33 to 48).

**Poetry**

Selections from *Intkhab Adabiyat-e-Farsi*: Published by Jyed Press, Balli Maran, Delhi.

1. Rubaiyat-e-Sarmad (Pages from 144 to 146).
2. Sho'orai Asar-e-Hazir
  - A) Ai Ranj bar by Khanum Parveen Aitsami (Page-164)
  - B) Jamhuri by Arif Qazwini (Pages-169)
  - C) Libas-e-Watai by Sarmad Tehrani (Page-170)
  - D) Parada-e-Beenash by Rasheed Yasmee (Page-175)

**Books Prescribed:**

1. *Intkhab Adabiyat-e-Farsi* by Syed Hasan and published by Ram Narain Lal Arun Kumar, 2, Katra Road, Allahabad- 211002.
2. *Nisab-e-Jadeed-e-Farsi* published by Jyed Press, Balli Maran, Delhi.

**Books Recommended:**

1. *Jadeed Farsi Shairi* by Munib-ur-Rehman, Publication Bureau, Aligarh Muslim University, Aligarh.
2. *Jadeed Farsi Shairi* by Dr. Mohd. Taqi Ali Abidi.
3. *Parvin Ai'tsami* by Dr. Mohd. Taqi Ali Abidi.
4. *Asari Farsi Sha'iri* by Dr. Syed Ahsan-uz-Zafar.
5. *Shora-e-Namwar* by M.M. Jalali.
6. *Tarikh-e-Adabiyat-e-Iran*, tr. by Mubariz-ud-din Rif'at, 1999.

**(All the above books have been published by Publication Bureau, Aligarh Muslim University, Aligarh).**

**PERSIAN**  
**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 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 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**.

**Composition, Grammar and Media**

a) **Composition:** Essay in Persian on any one of the following: Gulistan-e-Saadi Hafiz, Farsi Ghazal, Farsi Qasida, Masnavi Ma'navi, Sarmad, Bahar, Parveen, Umar Khayam & Khusru bahaisyat Ghazalgo.

b) **Grammar:** Definitions and examples of the following:

Ajza-e-sheer, Matla, Maqta, Husan-e-Matla, Tashbeeh, Gurez, Dua, Rukhsat, Salam-wa-Noha.

Tajnis (Tajnis-e-Taam, Tajnis-e-Murakkab, Tajnis-e-Khatti).

Talmih, Ista'ara, Kinaya, Tashbeeh, Ihaam, Mubaligha, Husan-e-Ta'leel.

Tajahul-e-Arifana, Siyaqat-ul-Adad, Mira'tun-Nazir-o-Tarse'a.

c) **Media and Information:**

News, Column, Editorial and Internet Basic Information.

**Books Recommended:**

1. Naseem-e-Balaghat by Jalaluddin Jafri, 2, Katra Road, Allahabad-211002.
2. Ma'ani-o-Bayan. By Dr. Jalil Tajlili, Tehran Edition.
3. Urdu Sahafat by Anwar Dehlvi. Urdu Academy, Kashmiri Gate, Delhi.
4. Al-Mu'ajjam by Shams Qais Razi, Edara Musannifin, Hyderabad.

**BOTANY****Paper-A****Plant Physiology, Biochemistry and Biotechnology****Hours of teaching: Total: 160****Theory: 60****Practical: 100****Total Marks: 100****Theory Marks: 75****Practical Marks: 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). 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**

**Plant-Water Relation:** Importance of water to plant life, physical properties of water, (imbibition) diffusion and osmosis, absorption, transport of water and transpiration, physiology of stomata.

**Mineral Nutrition:** Essential macro-and micro-elements and their role, mineral uptake, deficiency and toxicity symptoms (hydroponics).

**Transport of Organic Substances:** Mechanism of phloem transport, source-sink relationship, factors affecting translocation.

**Unit-II**

**Nitrogen and Lipid Metabolism:** Biology of nitrogen fixation, importance of nitrate reductase and its regulation, ammonium assimilation, structure and function of lipids, fatty acid biosynthesis,  $\beta$ -oxidation, saturated and unsaturated fatty acids, storage and mobilization of fatty acids.

**Photosynthesis:** Significance, historical aspects, photosynthetic pigments, action and absorption spectra and enhancement effects, concept of two photosystems, z-scheme, photophosphorylation, Calvin, cycle, C4 pathway, CAM plants, photorespiration.

**Respiration :** ATP-the biological energy currency, aerobic and anaerobic respiration, Krebs's cycle, electron transport mechanism (chemi-osmotic theory), redox potential, oxidative phosphorylation, pentose phosphate pathway.

**Unit-III**

**Basics of Enzymology:** Discovery and nomenclature, characteristics of enzymes, concept of holoenzyme, apoenzyme, coenzymes and cofactors regulation of enzyme activity, mechanism of action.

**Growth and Development:** Definitions, phases of growth and development, kinetics of growth, seed dormancy, seed germination and factors of their regulation, plant movements, the concept of photoperiodism, physiology of flowering, florigen concept, biological clocks, physiology of senescence, fruit ripening, plant hormones - auxins, gibberellins, cytokinins, abscisic acid and ethylene, history of their discovery, biosynthesis and mechanism of action, general account of salicylic acid, jasmonates and brassinosteroids, photomorphogenesis, phytochromes and cryptochromes, their discovery, physiological role and mechanism of action.

**Unit-IV**

**Genetic Engineering:** Tools and techniques of recombinant DNA technology, cloning vectors, genomic and cDNA library, transposable elements, techniques of gene mapping and chromosome walking.

**Biotechnology:** Functional definition, basic aspects of plant tissue culture, cellular totipotency, differentiation and morphogenesis, biology of *Agrobacterium*, vectors for gene delivery and marker genes, salient achievements in crop biotechnology.

**Suggested Readings:**

1. Bhojwani, S.S. 1990. Plant Tissue Culture: Applications and Limitations. Elsevier Science Publishers, New York, USA.
2. Dennis, D.T., Turpin, D.H. Lefebvre, D.D. and Layzell (eds.) 1997. Plant Metabolism (2nd Edition). Longman, Essex, England.
3. Galston, A.W. 1989. Life Processes in Plants. Scientific American Library, Springer-Verlag, New York, USA.
4. Hopkins, W.G. 1995. Introduction to Plant Physiology. John Wiley & Sons, Inc., New York, USA.
5. Lea, P.J. and Leegood, R.C. 1999. Plant Biochemistry and Molecular Biology. John Wiley & Sons, Chelichester, England.
6. Mohr, H. and Schopfer, P. 1995. Plant Physiology. Springer-Verlag, Berlin, Germany.
7. Old, R.W. and Primrose, S.B. 1989. Principles of Gene Manipulation, Blackwell Scientific Publishers, Oxford, UK.
8. Raghavan, V. 1986. Embryogenesis in Angiosperms: A Developmental and Experimental Study, Cambridge University Press, New York, USA.
9. Salisbury, F.B. and Ross, C.W. 1992. Plant Physiology (4<sup>th</sup> Edition). Wadsworth Publishing Co., California, USA.
10. Taiz, L. and Zeiger, E. 1998. Plant Physiology (2nd Edition). Sinauer Associates, Inc., Publishers, Massachusetts, USA.
11. Vasil, I.K. and Thorpe, T.A. 1994. Plant Cell and Tissue Culture. Kluwer Academic Publishers, The Netherlands.

**Suggested Laboratory Exercises:**

1. To study the permeability of plasma membrane using different concentrations of organic solvents.
2. To study the effects of temperature on permeability of plasma membrane.
3. To prepare the standard curve of protein and determine the protein content in unknown samples.
4. To study the enzyme activity of catalase and peroxidase as influenced by pH and temperature.
5. Separation of chloroplast pigments by solvent method.
6. Determining the osmotic potential of vacuolar sap by plasmolytic method.
7. Determining the water potential of any tuber.
8. Separation of amino acids in a mixture by paper chromatography and their identification by comparison with standards.
9. Bioassay of auxin, cytokinin, GA, ABA and ethylene using appropriate plant material.
10. Demonstration of the technique of micropropagation by using different explants, e.g. axillary buds, shoot meristems.
11. Demonstration of the technique of another pollen culture.
12. Demonstrate the ascent of sap using a dye.
13. Demonstration of root and shoot formation from the apical and basal portion of stem segments in liquid medium containing different hormones.
14. Demonstrate the transpiration pull by mercury method.
15. Demonstration of osmosis by potato osmoscope.
16. Comparison of loss of water from two surfaces of leaf by  $\text{CoCl}_2$  method/four leaf method.
17. Demonstration of imbibition by plaster of paris method.
18. Demonstration that  $\text{O}_2$  is evolved during photosynthesis.
19. Separation of pigments by paper chromatography/TLC method.
20. Demonstration of phototropism movements.
21. Demonstration the measurements of growth by arc auxanometer.
22. Preparation of nutrient medium.
23. Sterilization of glassware and plant material.
24. Preparation of explant for aseptic manipulation.
25. Requirements for setting up the tissue culture laboratory.

**Suggested Readings (for laboratory exercises)**

1. Devi, P. 2000. Principles and Methods of Plant Molecular Biology, Biochemistry and Genetics. Agrobios, Jodhpur, India.
2. Dixon, R.A. (Ed.) 1987. Plant Cell Culture: A Practical Approach, IRL Press, Oxford.
3. Moore, T.C. 1974. Research Experiences in Plant Physiology: A Laboratory annual. Springer-Verlag. Berlin.
4. Roberts, J. and Tuckar, G.A. (Eds.) 2000. Plant Hormone Protocols. Human Press, New Jersey, USA.
5. Scott, R.P.W. 1995. Techniques and Practices of Chromotography. Marcel Dekker, Inc., New York.
6. Smith, R.H. 2000. Plant Tissue Culture: Techniques and Experiments. Academic Press, New York.
7. Wilson, K. and Goulding, K.H. (Eds.) 1986. A Biologists Guide to Principles and Techniques of Practical Biochemistry. Edward Arnold, London, UK.



**BOTANY**  
**Paper-B Option (i)**  
**Ecology and Utilization of Plants**

**Hours of teaching:** Total: 160  
 Theory: 60  
 Practical: 100

**Total Marks: 100**  
**Theory Marks: 75**  
**Practical Marks: 25**

**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.

**Note:- Students may opt. Option (i) or Option (ii)**

**Ecology****Unit-I**

**Plants and Environment:** Atmosphere (gaseous compositions), water (properties of water cycle), light (global radiation, photosynthetically active radiation), temperature, soil (development, soil profiles, physico-chemical properties), and biota.

Morphological, anatomical and physiological responses of plants to water (hydrophytes and xerophytes), temperature (thermoperiodicity and verbalization), light (photoperiodism, heliophytes and sciophytes) and salinity.

**Population Ecology:** Growth curves, ecotypes, ecads.

**Unit-II**

**Community Ecology:** Community characteristics, absolute and relative frequency, density and dominance, basal area and importance value index (IVI), Whittaker's classification of biodiversity, indices of alpha, beta and gamma diversity, life forms, biological spectrum, ecological succession.

**Ecosystem :** Structure, abiotic and biotic components, food chain, food web, ecological pyramids, energy flow, biogeochemical cycles of carbon, nitrogen and phosphorus.

**Biogeographical Regions of India**

**Vegetation types of India:** Forests and grasslands

**Landscape Ecology:** Definition & concept, effect of patch size and shape on biodiversity, dynamics of land use.

**UTILIZATION OF PLANTS****Unit-III**

**Food Plants:** Rice, wheat, maize, potato, sugarcane.

**Fibres:** Cotton and jute.

**Vegetable Oils:** Groundnut, mustard and coconut. General account of sources of firewood, timber and bamboos

**Unit-IV**

**Spices:** General account of black pepper, cloves, cinnamomum, cardamon, ginger, tumeric, coriander, fennel and mint.

**Medicinal Plants:** General account of harar, bahera, neem amla, Aconitum Rauwolfia, Atropa, Datura, Withania and poppy.

**Beverages:** Tea and coffee.

**Rubber**

**Suggested Readings (for Ecology)**

1. Odum, E.P. 1983. Basic Ecology. Saunders, Philadelphia, Kermody, E.J. 1996. Concepts of Ecology. Prentice Hall of India Pvt. Ltd., New Delhi.
2. Mackenzie, A. et al., 1999. Instant Notes in Ecology. Viva Book Pvt. Ltd., New Delhi.
3. Kocchar, S.L. 1998. Economic Botany in Tropics, 2nd edition, Macmillan India Ltd., New Delhi.
4. Sambarmurthy, A.V.S.S. and Subramanyam, N.S. 1989. A Textbook of Economic Botany, Wily Eastern Ltd., New Delhi.
5. Sharma, O.P. 1996. Hill's Economic Botany (Late Dr. A.F. Hill, adapted by O.P. Sharma). Tata McGraw Hill Co. Ltd., New Delhi.
6. Simpson, B.B. and Conner-Ogozaly, M. 1986. Economic Botany-Plants in Our World. McGraw Hill, New York.

**Suggested Laboratory Exercises (Ecology)**

1. To determine minimum number of quadrats required for reliable estimate of biomass in grasslands through species-area curves.
2. To study the frequency of herbaceous species in grassland and to compare the frequency distribution with Raunkiaer's Standard Frequency Diagram.
3. To estimate Importance Value Index for grassland species on the basis of relative frequency, relative density and relative dominance in protected and grazed grassland.
4. To measure the vegetation cover of grassland through point frame method.
5. To measure the above ground plant biomass in a grassland.
6. To study the morphological anatomical features of hydrophyte (Hydrilla, Eichhornia) Xerophyte (Nerium, Calotropis).
7. To determine diversity indices (richness, Simpson, Shannon-Wiener) in grazed and protected grassland.
8. To estimate bulk density and porosity of grassland and woodland soils.
9. To determine moisture content and water holding capacity of grassland and woodland soil.
10. To study the vegetation structure through profile diagram.
11. To estimate transparency, pH and temperature of different water bodies.
12. To measure dissolved oxygen content in polluted and unpolluted water samples.
13. To estimate salinity of different water samples.
14. To determine the percent leaf area injury of different leaf samples collected around polluted sites.
15. To estimate dust-holding capacity of the leaves of different plant species.

**Suggested Readings (for laboratory exercises in Ecology)**

1. Krebs, C.J. 1989. Ecological Methodology. Harper and Row, New York, USA.
2. Ludwig, J.A. and Reynolds, J.F. 1988. Statistical Ecology, Wiley, New York.
3. Moore, P.W. and Chapman, S.B. 1986. Methods in Plant Ecology, Blackwell Scientific Publications.
4. Misra, R. 1968. Ecology Work Book. Oxford & IBH, New Delhi. APHA - Standard Methods for the Examination of Water and Waste Water. American Public Health Association, Washington, D.C.

**Suggested Laboratory Exercises (for Utilization of Plants)**

1. **Food Plants:** Study of the morphology, structure and simple microchemical tests of the foods storing tissues rice, wheat, maize, potato and sugarcane. Microscopic examination of starch in these plants (excepting sugarcane).
2. **Fibres:** Study of cotton flowers, sectioning of the cotton ovules/developing seeds to trace the origin and development of cotton fibers. Microscopic study of cotton and test for cellulose. Sectioning and staining of jute stem to show the location and development of fibers. Microscopic structure. Tests for lignocelluloses.
3. **Vegetable Oils:** Study of hand sections of groundnut, mustard and coconut and staining of oil droplets by Sudan III and Sudan Black.
4. **Field Visits:** To study sources of firewood (10 plants)/timberyielding trees (10 trees)/bamboos, list to be prepared mentioning special features, collection of plant based articles of common use.
5. **Spices:** Examine black pepper, cloves, cinnamon (hand sections) and opened of cardamom and describe them briefly.
6. Preparations of an illustrated inventory of 10 medicinal plants used in indigenous systems of medicine or allopathy: Write their botanical and common names parts used and diseases/disorders for which they are prescribed.
7. **Beverages:** Section boiled coffee beans and tea leaves to study the characteristic structural features.
8. Visit to in situ conservation site/Botanical Garden.

**Suggested Readings (for laboratory exercises for Utilization of Plants):**

1. Kocchar, S.L. 2000. Economic Botany of the Tropics, Macmillan India Pvt. Ltd., New Delhi.
2. Council of Scientific & Industrial Research 1986. The Useful Plants of India. Publications and Information Directorate. CSIR, New Delhi.
3. Prinientel, D. and Hall, C.W. (Eds.) 1989. Food and Natural Resources. Academic Press, London, New York.
4. Sharma, O.P. 1996. Hill's Economic Botany. Tata McGraw Hill Co. Ltd., New Delhi.
5. Swaminathan, M.S. and Kocchar, S.L. (Eds) 1989. Plants and Society. Macmillan Publications Ltd., London.

**BOTANY**  
**Paper-B (Option-II)**  
**Plant Breeding and Seed Technology**

**Hours of teaching: Total: 160**  
**Theory: 60**  
**Practical: 100**

**Total Marks: 100**  
**Theory Marks: 75**  
**Practical Marks: 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). 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. All questions (including Q. No. 1) will have carry equal marks.

**Plant Breeding****Unit-I****Introduction:-**

Definition, history of plant breeding in world and India, plant breeding a technology, attribute qualities of a successful plant breeder, aims and objectives, activities in plant breeding, achievements of P.B., harmful impacts and future prospects of Plant Breeding.

**Genetic Basis of Plant Breeding:**

Introduction, genotype and phenotype, intragenic and intergenic interactions, penetrance and expressivity, threshold characters, linkage and crossing over, cytoplasmic inheritance, qualitative and quantitative characters, polygenic inheritance, components of genetic variance and their estimation, heritability and its estimation, combing ability, genetic advance under selection, narrow genetic base, genetic erosion, population and types of population in crop plants, Hardy-Weinberg law and its explanation.

**Morphology and reproduction of Crop Plants:**

Patterns of various and morphological study of selected local crop plants (wheat, maize, rice, cotton, pea, gram, sarson, sugarcane), modes of reproduction (vegetative, sexual apomixis), modes of pollination in crop plants. Self-incompatibility (heteromorphic and homomorphic) and its role in plant breeding, male sterility (cytoplasmic, genetic, cytoplasmic-genetic, chemical) and its role in plant breeding.

**Unit-II****Domestication, Plant Introduction and Acclimatization**

**Domestication:-** definition, selection, change in crop plants.

**Germplam:-** definition, kinds, collection and conservation (*in situ* and *ex situ*)

**Plant Introduction and Acclimatisation:-** Definition, history, purpose, procedure. institutional organization, (NBPGR, BSI, FRI). quarantine, acclimatization, advantages and disadvantages of plant introduction.

**Hybridization**

Definition, types of hybridization procedure, difficulties in hybridization, distant hybridization and its application in plant breeding.

**Heterosis Breeding**

**Inbreeding depression:-** definition, manifestations and causes. **Heterosis:** definition, manifestations, homozygous and heterozygous balance, types of heterosis, causes of heterosis, role in plant breeding.

**Mutation Breeding:-** definition, spontaneous and induced mutations kinds of mutagens and mutagenesis basic considerations in mutation breeding, and its applications with limitations.

**Ploidy Breeding:-**

Aneuploidy and euploidy and their classification. Types of aneuploids and their role in plants breeding. Haploids, method of their preparation, characteristic features and their role in plant breeding. Autopolyploids, their artificial synthesis, characteristic features, role in evolution of crops (bread Wheat, American cotton and *Brassica* Species), role in crop improvement, (synthesis of *Triticale*)

### Unit-III

**Breeding Methods in Self-Pollinated Crops:-** Pureline, mass selection, pureline selection; hybridization and selection by pedigree method, bulk method, single-seed decent method and backcross method. Merits, demerits and achievements.

**Breeding Methods in Cross-Pollinated Crops:-** Population improvement by mass selection and recurrent selection(RS) (Simple RS, RS for GCA, RS for SCA and RRS), Hybrid varieties)-types, procedure of production of a hybrid variety, merits and demerits.

**Breeding Method in Asexually Propagated Crops:-** Clone its characteristics, origin of variations in a clone, procedure of clonal selection and their merits and demerits, Somatic hybridization somaclonal variations.

**Biotechnology in Crop Improvement:-** Tissue culture and its applications. Genetic engineering and its applications. Transgenic plants.

### Unit-IV

**Release of a Variety:-** Evaluation and procedure of release of a variety of Central Variety Release Committee and by State Variety Release Committee, notification of a variety.

**Quality Seed Production:-** Introduction comparison of Seed and Grain, Seed Quality Concept brief history, seed industry in India. The Indian Seeds Act (1966). Classes of quality seed/propagule, requirement of certified seed, seed production, seed testing, causes of deterioration of a variety, maintenance of improved seed (self-pollinated crops, inbred lines and asexually propagated crops).

**Seed Dormancy:-** Definition, causes, methods of breaking and applications.

**Plant Breeder's Rights (PBR):-** Brief history, requirements for PBR, farmer's rights need for PBR (Indian context), advantages and disadvantages of PBR, The new policy on seed development.

### Books

1. Aggarwal, P.K.(1993): Hand Book of Seed Testing.
2. Aggarwal, Ratan Lal (1999): Seed Technology.
3. Aggarwal, Ratan Lal (1984): Handling of Seed Crops to ensure top quality. Production high quality seed, Indian farmer digest.
4. Allard, R.W. (1960): Principles of Plant Breeding.
5. Anonymous (1997): National Gene Bank.
6. Arora, R.K. and Nayyar ER (1984): Wild Relatives of Crop Plants.
7. Chaudhary, R.C.: Principle of Plant Breeding.
8. Chaudhary, R.C.: Introduction to Plant Breeding.
9. Chalam, G.V., A Singh and J.E. Douglas (1967) Seed testing manual. ICAR and USAID Publication.

10. Conway, G. (1999): Green Revolution.
11. FAQ/IBPGR (1989): Technical Guidelines.
12. Hayes, Immer & Smith (1955) Methods of Plant Breeding.
13. Justice, O.L. (1972): Essentials of Seed testing, Contrb. Seed Biology, Vol. III.
14. Khush G.S. Cytogenetics of Aneuploids.
15. Paroda, R.S. and Arora, R.K. (1991): Plant Genetics Resources Conservation and Management.
16. Reddy, B. Gopal: Technology Mission on Quality Seed.
17. Roberts, E.H. (1972): Viability of Seeds.
18. Shanmugam, C. Elicit of National Seeds Policy, 2002.
19. Simmonds, N.W. (1976): Evolution of Crop Plant.
20. Simmonds, N.W. (1976): Principles of Crop Plants.
21. Singh, B.D. (Reprinted 2008): Plant Breeding, Principles and Methods, Kalyani Publishers.

### **Plant Breeding and Seed Technology**

#### **(Practical)**

1. Study of morphological and reproductive structure in crop plants mentioned in theory.
2. Procedure of emasculation and pollination techniques in field crops.
3. Determination of pollen viability.
4. Study of pollen germination.
5. Field study of common weeds in cultivated crops.
6. Seed purity analysis by seed weight method and seed count method.
7. Determination of moisture content of a given seed sample.
8. Viability test by tetrazolium chloride method.
9. Determination of seed germination.
10. Visit to seed production farm and seed processing plant.

**ZOOLOGY**  
(General/Annual System)

| Paper                                | Marks | Hours or<br>Equivalent<br>periods per week | Examination Duration<br>Hours |
|--------------------------------------|-------|--|-------------------------------|
| Paper–A                              | 75    | 3 Hours                                    | 3 Hours                       |
| Paper–B                              | 75    | 3 Hours                                    | 3 Hours                       |
| Practical–I<br>(Related to Paper–A)  | 25    | 2¼ Hours                                   | 3 Hours                       |
| Practical–II<br>(Related to Paper–B) | 25    | 2¼ Hours                                   | 3 Hours                       |

**Paper-A**  
**Developmental Biology and Genetics**

**Section-I: Developmental Biology**

**Section-II: Genetics**

**Paper-B**  
**Applied Zoology**

**Options:**

(i) Medical Zoology & Medical Laboratory Technology.

(ii) Economic Entomology.

(iii) Inland Fisheries (Aquaculture).

**Paper-A****Developmental Biology and Genetics****Time: 3 Hrs****Max. Marks: 75****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** question/long answers are to be set from Section-I and **five** from Section-II. Questions can have sub-parts.

**Instructions for the Students:**

- **Four** question/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.

**Course Contents:****Section-I****Developmental Biology**

1. Gametogenesis with particular reference to differentiation of spermatozoa, vitellogenesis; role of follicle/subtesticular cells in gametogenesis.
2. Egg maturation; egg membranes; polarity of egg.
3. Fertilization; parthenogenesis; cleavage patterns; cleavage; determination and differentiation.
4. Development upto three germinal layers and their fate in *Herdmania*, *Amphioxus*, frog, chick and rabbit.
5. Fate maps of chick and frog embryos.
6. Foetal membranes, their formation and role.
7. Mammalian placenta—its formation, types and functions.
8. Tissue interactions, basic concepts of organizers and inductors and their role.
9. Metamorphosis in *Herdmania* and *Rana* (frog).



**Section -II****GENETICS**

1. **Modification of Mendelian Ratios:**  
Non-allelic gene interaction, Modified F<sub>2</sub> ratios. (9:7;9:3;12:3:1;13:3;15:1;9:6:1)  
Gene modifications due to incomplete dominance ; lethal factors(2:1); Pleiotropic genes.
2. **Multiple Alleles:** Blood group inheritance, eye colour in *Drosophila*, pseudoallelism.
3. **Multiple Factors:** Qualitative and quantitative characters, inheritance of quantitative traits (skin colour in man).
4. **Linkage, Crossing Over and Recombination:** Linkage, sex-linked characters, crossing over, frequency of crossing over, cytological basis of crossing over, synaptonemal complex. Recombination in Fungi (Tetrad analysis).
5. **Gene and Genetic Code:** Structure of nucleic acids (**DNA & RNA**). Replication of DNA & transcription. Expression of gene (protein synthesis in Prokaryotes and Eukaryotes). Properties of genetic code, codon assignment, wobble hypothesis, split and over-lapping genes, Evolution of genes.
6. **Mutations:** Spontaneous and induced mutations, physical and chemical mutagen. Detection of mutations in Maize and *Drosophila*. Inborn errors of metabolism in man (Phenylketonuria, Alcaptonuria, Albinism). Somatic mutations and carcinogenesis.
7. Regulation of gene expressions in prokaryotes (Operon model) in eukaryotes.
8. **Extranuclear inheritance:** Chloroplast with special reference to *Mirabilis jalapa* and kappa particles in *Paramecium*.
9. **Population genetics:** Equilibrium of gene frequencies and Hardy-Weinberg law.
10. Genetic recombination in bacteria (conjugation, transduction and transformation) and in plasmids.
11. **Applied Genetics:** Recombination DNA, Genetic cloning and its applications in medicine and agriculture, DNA finger printing.

**PRACTICAL-I**  
**(Related to Paper-A)**

**Time: 3 Hrs.**

**Marks: 25**

1. Demonstration of Law of segregation and Independent assortment (use of coloured beads capsules etc.) Numerical for segregation and independent assortment, Epistasis.
2. Segregation demonstration in preserved material (Maize).
3. Cytoplasmic inheritance.
4. Inheritance of other human characteristics, ability to taste, PTC, thio urea.
5. Comparison of variance in respect of pod length and number of seeds/pods.
6. Calculation of gene frequencies and random mating (coloured beads, capsules).
7. Preparation of Polytene Chromosomes of *Chironomus*.
8. Dermatographics: Palm print taking and finger tip patterns.
9. Demonstration of evolutionary phenomena like homology, analogy, mimicry, crypsis.
10. Frog embryology :
  - Collection of spawn.
  - Identification of stages and preservation.
  - Preparation of permanent/temporary slide of representative developmental stages.
  - Slides of cleavage of tadpole larva of frog.
11. Study of early developmental stages of a freshwater snail (*Limnaea*).
12. Study of the following prepared slides :
  - Stages of gametogenesis, structure of egg and sperm of a mammal.
  - Larva of *Herdmania*.
  - Sections of early developmental stages of Frog upto tadpole, developmental stages of chick upto 96 hrs.

**APPLIED ZOOLOGY****Paper-B****Option-I: Medical Zoology & Medical Laboratory Technology****Time: 3 Hrs.****Max. Marks: 75****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.
- **Four** questions/long answers are to be set from section.

**Instructions for the Students:**

- **Four** questions/long answers are to be attempted, **two** each from Section-I & II.
- In all, **five** questions are to be attempted including compulsory one.

**Course Contents:****Section – I****Medical Zoology:**

1. Introduction of Parasitology (pertaining to various terminologies in use).
2. Brief introduction to pathogenic Microbes, Viruses, Rickettsiae, Spirochaetes and Bacteria.
3. Brief accounts of life history, mode of infection and pathogenicity of the following pathogens with reference to man; prophylaxis and treatment:
  - a) Pathogenic protozoans: *Entamoeba*, *Trypanosoma*, *Leishmania*, *Giardia*, *Trichomonas* and *Plasmodium*.
  - b) Pathogenic helminthes: *Fasciolopsis*, *Schistosoma*, *Echinococcus*, *Ancylostoma*, *Trichinella*, *Wuchereria*, *Dracunculus* and *Oxyuris*.
4. Life cycle and control measures of arthropod vectors of human disease : Malaria (*Anopheles stephens*, *A. culicifaces* Yellow fever and Dengue haemorrhagic fever, (*Aedes aegypti* A. *Albopictus*); Filariasis (*Culex pipien satigeans*) *Mansonia* sp. Japanes Encephalitis (*C. trinelorhynchus*); Plague (*Stenophalide cheopis*) and Epidemic Typhus (*Pediculus spp*).
5. Epidemic disease, such as Typhoid, Cholera, Small pox; their occurrence and eradication programmes.

6. Brief introduction to human defence mechanisms.
7. Humoral and cell mediated immune response. Physical & chemical properties of antigens. Antibodies structure and function of immunoglobulins M, G, A, E and D.
8. Antigens and antibody interactions. Serodiagnostic assays.
9. Vaccines.

## **Section - II**

### **Medical Laboratory Technology**

1. Laboratory safety rules, hazards and precautions during sample collections and laboratory investigations.
2. Laboratory Techniques: Colorimetry, Microscopy, Autoclaving, Centrifugation and Spectrophotometry.
3. Collection, transportation and preservation of different clinical samples.
4. Haematology, collection of blood (venous and capillary) anticoagulants (merits and demerits), Romanowsky's stains, total RBC count, erythrocyte sedimentation rate, TLC, DLC, eosinophil count, platelet count, reticulocyte count.
5. Bacteriology, sterilization (dry heat, moist heat, autoclave, filtration), disinfection, staining techniques, (gram stain, AFB stain, etc), culture media (defined and synthetic media & routine laboratory media), bacterial culture (aerobic and anerobic) and antibiotic sensitivity.
6. Biochemistry, protein estimation, estimation of blood urea, sugar and cholesterol, serum creatinine and uric acid, urine analysis, estimation of proteins, sugar, bile salts, bile pigments, ketone bodies, enzyme studies (serum transaminase, phosphatase, amylase and lipase), liver function test.
7. Histopathology: Common fixatives and staining techniques, histochemistry, principle and methods: staining of carbohydrates, proteins and fats with Bromophenol Blue, Periodic acid Schiff, Sudan Black Blue and Feulgen reagents.

**Suggested Readings:**

1. Baker, F.J. and Silverton, R.E. Introduction to Medical Laboratory Technology, 6th edition, Butlerworth and Co. Ltd. 1985.
2. Chatterjee, K.D., Parasitology, Protozoology and Helminthology, 12th ed., 1995.
3. Cheesborough, M. Medical Laboratory Technology for Tropical countries, 2nd edition, Butlerworth and Co., Ltd., 1987.
4. Garcia, L.S., Diagnostic Medical Parasitology, 4th ed., ASM Press Washington, 2001.
5. Kimball, J.W. (1986) : Introduction of Immunology, MacMillian Publishing Co., New York.
6. Kubly, J., Immunology, W.H. Freeman & Co., USA, 2000.
7. Roitt, I. (1984) : Essential Immunology, Blackwell Scientific Publications, Oxford.
8. Talib, V.H. Essential Laboratory Manual, Mehta Publishers, New Delhi, 1999.

**PRACTICAL–II**  
**(Related to Option-I)**

**Time: 3 Hrs.**

**Max. Marks: 25**

1. Demonstration of safety rules in laboratory like proper handling of patients, specimens and disposal of syringes, needles etc.
2. Demonstration of the use of autoclave, centrifuge and spectrophotometer.
3. Cleaning and sterilization of glass ware, using hot air oven, autoclave etc.
4. Demonstration of parts of microscope, its functioning and care.
5. Processing of clinical samples for culture and identification of pathogens; blood, throat swab, sputum, pus, urine, stool, CSF\* subject to availability of materials and other body fluids.
6. Estimation of Haemoglobin using Sahli's Haemometer.
7. Preparation of thick and thin blood films for malarial parasite.
8. Counting of WBC, RBC and DLC.
9. Examination of stools for demonstration of intestinal parasites.
10. Study of permanent slides and specimens of parasitic protozoans, helminthes and arthropods mentioned in the theory syllabus.
11. Analysis of blood groups, A,B, AB, O and Rh.
12. ESR, haematocrit, bleeding time, coagulation time, prothrombin time.
13. Estimation of blood sugar, serum urea, protein and cholesterol.
14. Fixation, embedding, cutting of tissue sections, and their staining (routine haemotoxylin and eosin and special staining with BPB, PAS, SBB and Fuelgen reagents).

**Option-II: ECONOMIC ENTOMOLOGY****Time: 3 Hrs.****Marks: 75****Note for the Paper Setters:**

- Nine questions are to be set in all.
- **Question No. 1** is compulsory consisting of short/multiple answers type questions covering the whole syllabus. It will have 10 parts of 1/½ marks each.
- **Eight** questions/long answers are to be set.

**Instructions for the Students:**

- **Four** questions/long answers are to be attempted. In all, **Five** questions are to be attempted including compulsory one.

**Course Contents:**

1. Systematic position, habits and nature of damage of the following pests of crops and vegetables :

**a) Sugarcane:**

1. Sugarcane leaf hopper (*Pyralia perpusila*)
2. Sugarcane top borer (*Scirpophaga nivovella*)
3. Sugarcane stem borer (*Chilotrea infuscatellus*)
4. Alongwith life cycle and control of *Pyralia perpusilla* (Sugarcane leaf hopper).

**b) Cotton:**

1. Pink bollworm (*Pectinophora gossypiella*)
2. Red cotton bug (*Dysdercus cinglulatus*)
3. Cotton grey weevil (*Mylocerus maculosus*)
4. Surface grasshopper (*Chrotogonus trachypterus*)
5. Cotton jassid (*Empoasca devastans*)
6. Along with life cycle and control of Pink boll worm (*Pectinophora gossypiella*)

**c) Paddy:**

1. Rice gundhy Bug (*Leptocorisa varicorni*)
2. Rice grasshopper (*Heiroglyphus bania*)
3. Rice Hispa (*Dicladispa armigera*)
4. Along with life cycle and control of gundhy bug (*Leptocorisa varicornis*).

**d) Wheat:**

1. Wheat stem borer (*Sesamia inferens*) Along with life cycle and control.
2. Termites
3. Wheat Aphid and Jassid

**e) Vegetables:**

1. Red pumpkin beetle (*Aulacophora foveicollis*)
2. Pumpkin fruit fly (*Dacus cucurbitae*)
3. Hadda beetle (*Epilachna vigintioctopunctata*)
4. Along with life cycle and control of pumpkin fruit fly (*Dacus cucurbitae*)

**f) Pests of stored grains: Systematic position, habits and nature of damage of the following pests of stored grains:**

1. Pulse Beetel (*Callosobruchus maculatus*) along with life cycle and control.
2. Rice weevil (*Sitophilus oryzae*)
3. Khapra beetle (*Trogoderma granarium*)
4. Rust red flour beetle (*Tribolium castaneum*)
5. Rice moth (*Corcyra cephalonica*)
6. Lesser grain borer (*Rhizopertha dominica*)

## 2. Systematic position, disease caused and control of the following pests of Medical and Veterinary importance:

1. Mosquitoes
2. Sand fly (*Phlebotomus minutus*)
3. House fly (*Musca domestica*)
4. Horse fly (*Tabanus striatus*)
5. Blow fly (*Calliphora erythrocephala*)
6. Warble fly (*Hypoderma lineatum*)
7. Lice Poultry louse (*Menopon gallinae*)
8. Sucking louse (*Haematopinus surystrernus*)
9. Fleas



3. **Useful Insects:** Principles of sericulture, apiculture and lac culture industries.
4. **Insect Control and Pest Management:**
  1. Principles, history and modern status of biological control of insect pests.
  2. Chemical control: History and principle of chemical control; categories of pesticides and important pesticides of each category; insect repellents and attractants.
  3. Recent methods of pest suppression; sterile insect release methods; behavioral control involving the use of pheromones; integrated pest control.
5. Mouth parts of red cotten bug, grasshopper, cockroach, Mosquito & honey bee.

**Suggested Reading Material:**

1. Alford, D.V. (1999). A text book of Agricultural Entomology. Blackwell Science Publishers, Cambridge, U.K.
2. Atwal, A.S. and Dhaliwal, G.S. (1997). Agricultural pest of South Asia and their management. Kalyani Publishers, New Delhi.
3. Dhaliwal, G.S. and Arora, R. (1996), Principles of insect management. Globe offset Press, New Delhi.
4. Hill, D.S. (1993). Agricultural insect pests of the Tropics and their control, 2nd Edition, Cambridge University Press, Cambridge, New York.

**PRACTICAL-II**  
**(Related to Option-II)**

**Time: 3 Hrs.**

**Marks: 25**

1. Feeding Apparatus: Mouth parts of honey bee, butterfly and red cotton bug by preparing permanent mounts.
2. A study of different types of larvae and pupae of insects.
3. External morphology and identification marks of the pests *Pyrilla perpusilla* (Sugarcane leaf hopper), *Pectinophora gossypiella* (Pink bollworm), *Leptocorisa varicornis* (Gunbdhy bug) *Heiroglyphus banian* (Paddy grass hopper), *Dacus cucurbitae* (Pumpkin fruit fly).
4. External morphology and identification marks of the following stored grain pests : *Sitophilus oryzae* (Rice Weevil), *Tribolium castaneum* (Rust red flour beetle), *Rhizopertha dominica* (Lesser grain borer/susri), *Trogoderma granarium* (Khapra beetle), *Callosobruchus maculatus* (Pulse beetle/Dhora).
5. External morphology and identification marks of the following insects of Medical/Veterinary importance–Mosquitoes (*Culex*, *Anopheles* and *Aedes*), house fly, blow fly, warble fly and horse fly.
6. A study of life stages of silkworm and honeybees.
7. Collection of insects representing different orders; storage and preservation of insect material.
8. Structure and working of common sprayers. Hand compression sprayer, Knap sack sprayer.
9. Visit to apiary and godowns for study of infestation.

**OPTION-III: INLAND FISHERIES (AQUACULTURE)****Time: 3 Hrs.****Marks: 75****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 1/½ marks each.
- **Eight** questions/long answers are to be set spreading over the whole syllabi.

**Instructions for the Students:**

- **Four** questions/long answers are to be attempted. In all, **Five** questions are to be attempted including compulsory one.

**Course Contents:**

1. History of inland fisheries in India.
2. Morphology of a typical fish (carp, cat-fish, freshwater eel, perch).
3. Structure of mouth of different fishes in relation to feeding habits.
4. Identification and classification of important fishes of Punjab, Haryana and Himachal Pradesh.
5. Bionomics of *Labeo rohita*, *Cirrhinus mrigala* and *Wallago attu*.
6. Exotic fishes: History, their introduction, morphology, their role in fish culture, impact on native fish faun.
7. Induced Breeding: History, Technique, Chemicals involved in induced breeding and Impact on fish culture.
8. Pond culture: Construction of pond, Types of pond, Fertilization of pond and Maintenance of pond.
9. Aquatic weeds and their control both biological and chemical.
10. Riverine fisheries of river Sutlej and Beas.
11. Reservoir fisheries: Gobindsagar, Pong Dam.
12. Culture systems: Conventional, Extensive, Intensive, Monoculture and Polyculture.
13. Integration of fish farming with Duckry, poultry, piggery and dairy.
14. Sewage fed fisheries.
15. Cold water fisheries: Mhaseer fisheries and Trout fisheries.

16. Fish Disease and their control: Viral, Bacterial, Fungal, Helminth, Crustacean.
17. Disease due to unhygienic conditions during transportation.
18. Fish by-products.
19. Marketing of fish: Fresh Water fish, Preservation of fish.

**Suggested Readings:**

1. Fish and Fisheries of India: V.G. Jhingran, Hindustan Publishing Corporation of India, Delhi.
2. Fish of India Vol. I & II: F-day Reprinting Edition Jagmandar Book Agency, New Delhi.
3. Monograph on the: M.S. Johal & K.K. Tandon, Pb. Fish of Bull, Fishes of Reorganised, Vols. I & II, 1979, Punjab 1980.
4. Fishery Development: S.C. Aggarwal & M.S. Johal, Narendra Publishing House, Delhi.
5. Fisheries of Punjab : M.S. Johal & K.K. Tandon, Res. Bull, Panjab University, Vol. 32, pp. 143-154, 1981.
6. Freshwater Fishery Biology: Kerl F-Legler Wm. C-Brown Co. Dublingus IOWA, USA.
7. Fisheries Techniques: Brian R. Murphy & David W. Wills (Ed.) American Fisheries Society Bethesde Maryland, USA.

**PRACTICAL-II**  
**(Related to Option-III)**

**Time: 3 Hrs.**

**Marks: 25**

1. Morphology of a Carp, Cat fish and Perch.
2. Morphometric and meristic characters of typical fish.
3. Identification of the following fishes using key : *Notopterus* spp.; *Labeo rohita*, *L. bata*, *Cirrhinus mrigala*, *Catla catla*, *Puntius sarana*, *Tor putitora*, *Schizothorex*, *Aorichthys seenghala*, *Wallago attu*, *Callichrous padda*, *Bagarius bagarius*, *Heterpneustus fossilis*, *Channa marulius*, *C. Striatus*, *Xenentodon cancila*, *Cyprinus carpio*, *Hypophthalmichthys molitrix*, *Ctenopharyngodon idella*, *Colisa fasciata* and *Mastacembelus armatus*.

For the identification of these fishes, the candidate can use already prepared keys or they can prepare their own keys.

4. Determination of food and feeding habits of locally available fishes on the basis of stomach analysis adopting the following methods :
  - a) Frequency occurrence method
  - b) Feeding intensity
  - c) Point method
5. Determination of maturity stages (both male and female) of any commercial fish (Preserved specimens).
6. Preparation of permanent slides of phytoplanktons and zooplanktons which constitute the food of commercial fishes. Their identification and study of important characters.
7. Identification of aquatic weeds of a fish pond.
8. Estimation of following chemical parameters of the water of a fish pond :
  1. Temperature
  2. pH
  3. Dissolved oxygen
  4. Phosphates
  5. Total Dissolved solids
  6. Nitrates
  7. Hardness
  8. Examination of diseased fishes
  9. Visit of various fish ponds and fish market.

**MICROBIOLOGY****Paper-A****Applied Microbiology-I****Time: 3 Hours****Marks: 75****Instructions 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. Microorganisms in Industry : Historical development definition and scope of industrial microbiology; contribution of Louis Pasteur in fermentation; sources of industrial microorganisms and their essential characteristics, natural habitats, cultural collections and preservation of stock cultures.

**Unit-II**

2. Screening of Microorganisms: Isolation of industrially important microorganisms, primary and secondary screening methods for isolating useful Yeast, bacteria and fungi. Fermentation media: Composition of production media, characteristics of an ideal production medium, raw materials.

**Unit-III**

3. Fermentation and Fermentation Processes: Fermentation as biological activity, Types of industrial fermentation's (submerged, solid state and continuous fermentation). Design of fermentor (body construction, aeration and agitation and control of septic conditions), Basics of batch culture, fedbatch culture and continuous culture.

**Unit-IV**

4. Recovery and purification of fermentation products: General principles of separation of fermentation products, solid particles, foam separation, separation by filtration, centrifugation, cell disruption, liquid-liquid chromatography, ion-exchange chromatography. Fermentation economics; plant fermentation designing, process designing, market potential and recovery costs for the industrial set-up.

**Books Recommended:**

1. Casida, L.E. 1991. *Industrial Microbiology*. Wiley Eastern Ltd., New Delhi.
2. Stanbury, P.F. Whittaker, A. and Hall S.J. 1995. *Principles of Fermentation Technology*. Elsevier Science Ltd., U.K.
3. Patel, A.H. 1984. *Industrial Microbiology*, Macmillan India Ltd., Delhi.
4. Trevan M.D., Saffey, S., Goulding, K.H. and Stanberry, P. 1988. *Biotechnology: The Biological Principles*, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
5. Freifelder, D. 2006. *Microbial Genetics*. Jones and Bartlett Publishers Inc., Boston.

**MICROBIOLOGY**  
**Paper-B**  
**Applied Microbiology-II**

**Time: 3 Hours**

**Marks: 75**

**Instructions 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. Fermentation Process of Fermented Foods: Fermented cereal, legume and milk products. Microbiology of natural fermentation. Saurekraut, Youghurt, soya sauce. cheese.

**Unit-II**

2. Microbial Cell as Fermentation Products: Baker's and brewer's yeast, single cell protein, mushroom farming. Production of industrial chemicals: Acetic acid, citric acid, acetone and butanol.

**Unit-III**

3. Production of alcoholic Beverages: Beer, wine and distilled beverages–Whisky, Brandy, Vodka, Gin production and applications of industrial enzymes: Amylases, proteases, immobilization of enzymes.

**Unit-IV**

4. Vitamins and Amino Acids Production by Microorganisms: Riboflavin (B2) and cyanocobalamin (B12), glutamic acid. Production of antibiotics: Penicillin and streptomycin.

**Books Recommended**

1. Read, G. 1982. Prescott and Dunn, *Industrial Microbiology*. CBS Publishers & Distributors, New Delhi.
2. Casida, L.E. 1991. *Industrial Microbiology*. Wiley Eastern Ltd., New Delhi.
3. Patel, A.H. 1984. *Industrial Microbiology*. Macmillan India Ltd., Delhi.
4. Trevan, M.D. Saffey, S., Goulding, K.H. and Stanberry, P. 1988. *Biotechnology : The Biological Principles*, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
5. Wiseman, A. 1995. *Handbook of Enzyme Biotechnology*. Ellis Harwood Ltd., London.
6. Wood, J.B.B., 1998. *Microbiology of Fermented Foods*, Volumes 1 and 2, Blackie Academic and Professional, London.
7. Power C.B. and Dagniwala, H.F. 1992. *General Microbiology*. Volume-2. Himalaya Publishing House, New Delhi.

**MICROBIOLOGY****Practicals-III****Time: 4 Hours****Marks: 50**

1. Isolation of various types of microorganisms from (a) soil (b) fruits.
2. Screening of some industrially important microorganisms
  - (a) amylase producers.
  - (b) protease producers.
3. Production of amylases and proteases in liquid medium using the selected organisms.
4. Essay of various crude enzyme preparations
  - (a) Amylase
  - (b) protease.
5. Protein estimation by Lowry method.
6. Preservation of industrially important microorganisms by various methods (a) storage in 10 % glycerol (b) storage in mineral oil.
7. Production of alcohol from molasses and cereal grains.
8. Immobilization of microbial cells and enzyme preparations by calcium alginate entrapment method.
9. Comparison of submerged and solid state fermentation techniques for amylase production.
10. Determination of % viability of Yeast cells by haemocytometer.



**INDUSTRIAL MICROBIOLOGY****(Vocational)****Paper-A****Environment and Agricultural Microbiology****Time: 3 Hrs.****Marks: 75****Instructions 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. Physico chemical characteristics of soil, water and air in relation to microorganisms. Microbiology of air, soil and water. Genetic & Physiological adaptations to environmental condition.

**Unit-II**

2. Biogeochemical cycling of carbon, hydrogen, oxygen, sulphur, phosphorus-Interactions among microbial population: Neutralism, Commensalism, Mutualism, Competition, Amensalism, Parasitism, Predation, Mycorrhizal, association.

**Unit-III**

3. Agricultural Microbiology. Soil fertility and management of agricultural soil. Influence of available nitrogen on soil fertility, Crop rotation, soil management practices, Mushroom cultivation and their use.

**Unit-IV**

4. Biological Control: General consideration, viral pesticides, Bacterial pesticides & fungal pesticides, concept of biomagnification. Biodegradation of pollutants: Solid waste management, sanitary land fills, composting, Treatment of waste, primary treatment, secondary treatments, tertiary treatment, Disinfection.

**Books Recommended:**

1. ATLAS, R.M. and Bartha, M. 1981. *Microbiology Ecology*, Fundamentals and Applications.
2. Brock, T.D. 1966. *Principles of Microbial Ecology*, Prentice Hall, USA.
3. Campbell, R. 1977. *Microbial Ecology*, Blackwell Scientific, London.
4. Lynch, J.M. and Poole, M.J. 1979. *Microbial Ecology : A Conceptual Approach*, Blackwell Scientific, London.

**INDUSTRIAL MICROBIOLOGY****(Vocational)****Paper-B****(Fermentation Technology)****Time: 3 Hrs.****Marks: 75****Instructions 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. The fermentation industry, Selection and development of Industrial Microorganisms, Fermentation media, aeration, pH, temperature, Batch versus continuous culture, Immobilized enzymes & their applications.

**Unit-II**

2. Production of some Microbial Enzymes; Proteases, Amylases, Cellulases, Microbial Production of alcoholic beverages; Beer, Wine and Whisky.

**Unit-III**

3. Production of Organic acids; Acetic Acid, Citric Acid, Lactic Acid, Gibberellic Acid, Production of Amino Acids; Lysine, Glutamic Acid.

**Unit-IV**

4. Downstream processing and product recovery; Production of Pharmaceuticals Antibiotics :- Tetracycline & Penicillin, Vaccines, Vitamins. Bioleaching of metals, microbial treatment of Oil Pollution and Oil recovery.

**Books Recommended:-**

1. Fermentation Technology by Whittaker, 1995.
2. Industrial Microbiology by Casida, 1989.
3. Industrial Microbiology by A.H. Patel, 2004.
4. Biotechnology: A text book of Industrial Microbiology by W. Cruger and A.Cruger, 2003.

**PRACTICAL**  
**(Fermentation Technology, Environmental & Agriculture Microbiology)**

**Time: 4 Hrs.**

**Marks: 50**

1. Study of symbiotic/asymbiotic nitrogen fixing bacteria.
2. Study the process of ammonification.
3. To study nitrification in soil.
4. Isolation of *Aspergillus niger* from soil.
5. Demonstration for the cultivation of mushrooms.
6. Estimation of microbial ethanol production.
7. IMVIC test for water analysis.
8. Isolation of actinomycetes from soil.
9. Isolation of thermophilic micro organisms from soil.
10. Biochemical test for differentiation of different bacteria from water.

**BIOTECHNOLOGY (VOCATIONAL)****Scheme of Courses**

|                 |   |            |    |
|-----------------|---|------------|----|
| <b>Paper-A:</b> | <b>rDNA Technology and Animal Biotechnology</b>                       | 3          | 60 |
| <b>Paper-B:</b> | <b>Environmental Biotechnology and Plant Biotechnology</b>            | 3          | 60 |
| <b>Paper-C:</b> | <b>Practicals–Culture Methods and Molecular Biological Techniques</b> | 3          | 30 |
|                 | <b>Job Training</b>   | 3          | 30 |
|                 | <b>Entrepreneurship</b>   | 2          | 20 |
|                 | <b>Total:</b>   | <b>200</b> |    |

**Paper-A****rDNA Technology and Animal Biotechnology****Time: 3 Hrs.****Marks: 60****Periods - 3****Note for the Paper Setters/Examiners:**

Each question paper will consist of three sections as follows:

**Section–A:** 10 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 and half marks, total weightage being **15 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 **25 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 10 marks, total weightage being **20 marks**.

**rDNA Technology****Unit-I**

Choice and selection of the tools and the techniques, Vehicles: Plasmids and bacteriophages, phagmids, cosmids, viruses. Purification of DNA from bacterial, plant and animal cells. Manipulation of purified DNA. Introduction of DNA into living cells.

**Unit-II**

Cloning vectors for *E.coli*. yeast, fungi; Agrobacterium and viral vectors for plants & viral vectors for animals.

- Application of cloning in gene analysis
- How to obtain a clone of a specific gene
- Studying gene location and structure Studying gene expression Gene cloning and expression of foreign genes in research and biotechnology
- Production of protein from cloned genes

**Unit-III**

- Gene cloning in medicine
- Pharmaceutical compounds
- Artificial insulin gene
- Recombinant vaccine
- Diagnostic reagents

Animal Biotechnology

**Unit-IV**

General metabolism, Special secondary metabolites products (Insulin, Growth hormone, Interferon, t-plasminogen activator, factor VIII etc.), Expressing cloned proteins in animal cells, Overproduction and processing of chosen protein. The need to express proteins in animal cells.

**Unit V**

Production of vaccines in animal cells, Production of monoclonal antibodies, Growth factors promoting proliferation of animal cells (EGF, FGF, PDGF, IL-1, IL-2, NGF, erythropoietin etc.), Bioreactors for large scale culture of cells, Transplanting culture cells.

**Books Recommended:**

1. Butler, M. (1987). *Animal Cell Technology—Principles and Practices*, Oxford University Press.
2. Goeddel, D.V. (1990). *Methods in Enzymology*, Vol. 185 *Gene Expression Technology*, Academic Press Inc. San Diego.
3. Mickloss, D.A. and Freyer, G.A. (1990). *DNA Science : A First Course in Recombinant Technology*, Cold Spring Harbor Laboratory Press, New York.
4. Butler, M. (1991). *Mammalian Cell Biotechnology—A Practical Approach*, IRL, Oxford University Press.
5. Spier, R.R. and Griffiths, J.B. (1994). *Animal Cell Biotechnology*, Academic Press, London.
6. Freshney, RT. (1994). *Culture of Animal Cells*, John Wiley and Sons, New York.
7. Primrose, S.B. (1994). *Molecular Biotechnology*, 2nd edition, Blackwell Scientific Publishers, Oxford.
8. Glover, D.M. and Hames, B.D. (1995). *DNA Cloning: A Practical Approach*, IRL Press, Oxford.
9. Rasko, L, and Downes, C.S. (1995). *Genes in Medicine*, Champan & Hall.
10. Berger, S.L. and Kimmel, A.R. (1996). *Methods in Enzymology*, Guide to Molecular Cloning Techniques, Vol. 152, Academic Press Inc., San Diego.
11. Butler, M. (1996). *The Animal Cell Culture and Technology*, IRL, Oxford University Press.
12. Maulik S. and Patel, S.D. (1997). *Molecular Biotechnology Therapeutic Application and Strategic*, John Wiley & Sons.
13. Sambrook, J., Fritsch, E.F. and Maniatis, T. (2000). *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratory Press, New York.

**BIOTECHNOLOGY (VOCATIONAL)****Paper-B****Environmental Biotechnology and Plant Biotechnology****Time: 3 Hrs.****Marks: 60****Periods - 3****Note for the Paper Setters/Examiners:****Each question paper will consist of three sections as follows:**

**Section–A:** 10 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 and half marks, total weightage being **15 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 five marks, total weightage being **25 marks**.

**Section–C:** This section will comprise of four essay type questions to be attempted. Maximum length of answer can be upto 5 pages. Each question will carry 10 marks, total weightage being **20 marks**.

**Environmental Biotechnology****Unit-I**

Renewable and non-renewable resources, What is renewable should be bioassimilable biodegradable; Major consumer items : Food, fuel and fibres, Conventional fuels and their environment impact :

- Firewood, Plant and animal wastes, Coal, Gas, Animal oils. Modern fuels and their environment impact
- Methogenic bacteria and biogas.
- Microbial hydrogen production, Microbial bioconversion, biotransformation, beer & wine production.
- Microbial mining, metalurgy, BOD & COD, environmental degradation and role of biotechnology in sustainable development. Environmental microbiology in chemical and other industries.
- Conversion of sugars to ethanol. The gasohol experiment.
- Solar energy converters-Hopes from the photosynthetic pigments.
- Plant based petroleum industry.
- Cellulose degradation for combustible fuel.

**Unit-II**

Biotechnological inputs in producing good quality nature fibres - Transgenic sheep and transgenic plants, Microbiological quality of food and water, Treatment of municipal waste and industrial effluents and waste water management, Degradation of pesticides and other toxic chemicals by microorganisms, Thuringensis toxin as a natural pesticide, Biological control of other insects swarming the agricultural fields, Enrichment of ores by microorganisms, Biofertilizers and organic farming. Nitrogen fixing microorganisms enrich the soil with Assimilable nitrogen.

**PLANT BIOTECHNOLOGY****Unit-III**

Introduction to *in vitro* methods. Terms and definitions. Use of plant growth regulators, Beginning of *in vitro* cultures in our country, Ovary and ovule culture, *in vitro* Pollination and fertilization. Embryo culture, embryo rescue after wide hybridization, and its applications. Introduction to the processes of embryogenesis and organogenesis and their Practical applications, Clonal, multiplication of elite species using Micropropagation methods via axillary bud, shoot-tip and meristem culture.

**Unit-IV**

Haploids and their applications. Somaclonal variations and their applications, Endosperm culture, production of triploids and their Practical applications, Single-cell suspension cultures and their applications in selection of variants.

**Unit-V**

Introduction to protoplast isolation : Principles and applications, Testing of viability of isolated protoplasts, Various steps in the regeneration of protoplasts. Somatic hybridization—an introduction, Various methods for fusing protoplasts, Chemical, electrical, Use of markers for selection of hybrid cells. Practical applications of somatic hybridization (hybrids vs Cybrids). Use of plant cell, protoplasts and tissue culture for genetic manipulation of plants. Introduction to *Agrobacterium tumefaciens*, Tumor formation on plants using *A. tumefaciens* (Monocots vs. Dicots), Root-formation on plants using *A. rhizogenes*, Practical application of genetic transformation.

**Books Recommended:**

1. Davis, B.D., Dulbecco, R., Eisen, H.N. and Ginsberg, H.S. (1991). Microbiology, 4th edition, Harper and Row, Singapore.
2. M.K. Razdan (1999). An introduction to Plant Tissue Culture, Oxford & IBH Publishing Co. Pvt. Ltd.
3. Pelczar, M.J. Jr., Chan ECS and Krieg, N.R. (1993). Microbiology Concepts and Applications, McGraw Hill, NY.
4. Stanbury, P.F. Whitaker, A. and Hall, S.J. (2001). Principles of Fermentation Technology, 2nd ed., Aditya Books (P) Ltd., New Delhi.
5. B.D. Singh (2001), Biotechnology, Kalyani Publishers.
6. G.S. Chahal and S.S. Gosal (2002). Principles and Procedures of Plant Breeding. Biotechnology and Conventional Approaches, Narosa Publishers.

**PAPER-C**  
**Culture Methods and Molecular Biological**  
**Techniques**  
**(Practicals)**

**Time: 3 Hours**  
**Periods - 3**

**Marks: 30**

Preparation of Media (simple and complex) significance of sterilization, selection of explant.  
Initiating plant tissue culture : (differentiation of explants).

Growth of plant cells into undifferentiated callus mass.

Raising plant cell suspension cultures *in vitro*.

Monitoring Microbial contamination (bacteria, fungi and mycoplasma)/Sterilization techniques:  
Theory and Practical.

- Glass ware sterilization

- Media sterilization

- Laboratory sterilization

Demonstration/operation of large scale fermenters

Screening, isolation and selection of cellulolytic microorganism B.O.D. determination

Isolation of chromosomal and plasmid DNA from bacteria

Isolation of genomic DNA from blood

Agarose gel electrophoresis

Spectrophotometer analysis of DNA.

Restriction digestion of DNA

Making competent E. coli

Transformation and selection of competent E Coli.

**Books Recommended:**

1. Benson, H.J. (1994). Microbiological Applications, 6th ed., Win, C. Brown Publishers, England.
2. Cappucino, J.G. (1999). Microbiology–A Laboratory Manual, 4th ed., Harlow, Addition-Wesley.
3. Freshney, RT, (1994). Culture of Animal Cells, John Wiley and Sons, New York.
4. Butler, M. (1996). The Animal Cell Culture and Technology, IRL, Oxford University Press.



## **Job Training**

### **Paper-C**

**Periods - 3**

**Marks: 30**

This could be taken up of over 9 periods of one month in any Institute/Industry related to Biotechnology.

## **Paper-C**

### **Entrepreneurship**

**Periods - 2**

**Marks: 20**

The students will be delivered lectures on how to select for a product line, design and develop processes, economies on material and energy requirement, stock the product and release the same for marketing etc. The basic regulations of excise also should be to apprise to the candidates. In parallel the students will be asked to survey the demand for a given product, feasibility of its production under the given constraints of raw material energy input financial situations export potential etc. Procedural details on how to select process, how to move for loans, how to operate and how to repay the loans in a phasic manner should also be highlighted during the lectures. The semester should end with submission of a draft project by the students. Evaluation of the project will be based on vivavoce conducted by internal examiner.

**HUMAN GENETICS**

|  |            |            |            |            |
|--|------------|------------|------------|------------|
| <b>Human Genetics and Cytogenetics</b>                       | <b>75</b>  | <b>-</b>   | <b>75</b>  | <b>60</b>  |
| <b>Basic Human Molecular Genetics</b>                        | <b>75</b>  | <b>-</b>   | <b>75</b>  | <b>60</b>  |
| <b>Human Cytogenetics and Molecular Genetics (Practical)</b> | <b>-</b>   | <b>50</b>  | <b>50</b>  | <b>100</b> |
| <b>Total</b>   | <b>150</b> | <b>50</b>  | <b>200</b> | <b>-</b>   |
| <b>Grand Total</b>   | <b>450</b> | <b>150</b> | <b>600</b> | <b>-</b>   |

**Paper: Human Genetics and Cytogenetics****Time: 3 Hrs.****Total Hours: 60****Marks: 75****Instructions for the 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 a half marks, the total 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 7½ 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**

Historical introduction to human genetics and cytogenetics, Human genetic perspectives in UK, USA, Germany and Soviet Union. The Human Genome–Packaging and organization of the human genome, Morphology of chromosomes, Movable elements in the human genome; The Human Genome Project.

**Unit-II**

Chromosome banding -G,C,R,Q, NOR, Kinetochores; Genome organization in the light of chromosome bands; Conceptsof bands at the molecular level, High resolution banding; Chromosome nomenclature; Chromosome mapping; Genetic maps, Cytological maps, Physical maps.

**Unit-III**

Lyon’s hypothesis; X-chromosome inactivation and reactivation; Sex-linkage,sex-limited and sex-influenced traits; Recent concepts in human sex determination; Mosaics and chimeras; True and pseudohermaphrodites. Multifactorial inheritance and quantitative traits : Genetic factors in common diseases and malformations; Threshold model and recurrence risks for polygenic diseases and malformations.

**Unit-IV**

Classification of mutations; Radiation-induced mutations, Chemical-induced mutations; Chromosomal aberrations; Molecular basis of point mutations; Somatic mutations and ageing; Chromosomes and oncogenes; Genetic toxicology. Mitochondrial genome and its pathology; Transgenic animals and their applications.

**Books Recommended:**

1. Cummings, M.R. (2003). Human Heredity: Principles and Issues. Thompson, Brooks/Cole, 6th ed.
2. Farzaneh, F. and Cooper, D.N. (Eds.) Functional Analysis of the Human Genome. Bios Scientific Publishers Ltd., Oxford.
3. Hartl, D.L. and Clark, A.G. (1997). Principles of Population Genetics. Sinauer Assoc., Inc. Publ., Sunderland.
4. ISCN (1985/1991). An International System for Human Cytogenetic Nomenclature. S. Karger AG, Basel.
5. Lewis, R. (2007). Human Genetics: Concepts and Applications. Wm. C. Brown Publishers, England.
6. Muller, R.F. and Young I.D. (2001), Emery's Elements of Medical genetics, Churchill Livingstone, New York, 11th ed.
7. Strachan, T. and Read, A. (2004). Human Molecular Genetics. Bios Scientific Publishers, Oxford.
8. Sumner, A.T. (2003). Chromosomes: Organization and Function. Blackwell Publishing Co.
9. Therman, E. and Miller, O.J. (2001). Human Chromosomes. Springer Verlag, New York, 4th ed.
10. Vogel, F. and Motulsky. A.G. (1996). Human Genetics: Problems and Approaches, Springer Verlag, Berlin, 3rd ed.
11. Wilson, G.N. (2000). Clinical Genetics–A Short Course. Wiley-Liss, New York.

**Paper: Basic Human Molecular Genetics****Time: 3 Hrs.****Marks: 75****Total Hours: 60****Instructions for the 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 a half marks, the total 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 sub-divided into parts at the discretion of the examiner.

**Unit-I**

An overview of molecules involved in the flow of genetic information; Double helical structure of DNA, Alternate forms of DNA double helix, Denaturation and renaturation of DNA, Variations in the shape of DNA and strandedness. Types and structure of RNA, RNA-DNA hybrid helices, Circular and spherical DNA. Replicon concept, Primosomes and replisomes, DNA modification systems, DNA repair systems.

**Unit-II**

General Eukaryotic transcription and translation-Promoter transcription factors and RNA polymerases, operon concept with reference to lac operon, arabinose operon. Post-transcriptional processing of RNA. General features of the genetic code. Degeneracy and universality of genetic code. Prokaryotic and Eukaryotic Ribosomes, Activation of amino acids, Initiation, elongation and termination of polypeptide chains.

**Unit-III**

Introduction to Enzymes, Nucleases, Restriction endonucleases, DNA ligase, DNA polymerase I, Reverse transcriptase, Terminal transferase, Cloning vectors. Southern and Northern blotting, Principle of molecular hybridization, Nucleic acid probes, Criteria for the selection and synthesis of probes, Labelling of probes.

**Unit-IV**

Effects of single amino acid substitutions on haemoglobin, sickle cell disease, thalassemia. Molecular structure of the A.B.H. antigens and their biosynthesis. Differential gene action with respect to haemoglobin, Lactate dehydrogenase, phosphoglucomutase. Inborn errors of metabolism—Alkaptonuria, Phenylketonuria, Tay-Sachs disease, Galactossemia, Familial hypercholesterolemia. Cystinuria.

**Books Recommended:**

1. Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K. and Watson, J.D. (2002), *Molecular Biology of the Cell*, Garland Press, USA.
2. Alberts, B., Roberts, K., Lewis, J., Hopkin, K., Johnson, A., Walter, P., Raff, M. and Bray, D. (2003). *Essential Cell Biology: An Introduction to the Molecular Biology of the Cell*, Garland Press, USA.
3. Brown, T.A. (1998). *Genetics: A Molecular Approach*. Van Nostrand Reinhold (International) Co. Ltd., London.
4. Brown, T.A. (2002). *Genomes*. Bios Scientific Publishers Ltd., Oxford, 2nd ed.
5. Copper and Geoffrey, M. (2000). *The Cell : A Molecular Approach*. Sinauer Assoc., Inc. Publ., Sunderland (MA), 2<sup>nd</sup> ed.
6. Freifelder, D. and Malacinski, G.M. (1998). *Essentials of Molecular Biology*. John and Bertlett Publ., U.K.
7. Hawkins, J.D. (1996). *Gene Structure and Expression*. Cambridge University Press, Cambridge.
8. Lewin, B. (2007). *Genes IX*. Oxford University Press, New York.
9. Sambrook, J., Friestsch, E.F. and Manjatis, T. (2001). *Molecular Cloning : A Laboratory Manual*. Cold Spring Harbor Laboratory Press, New York.
10. Singer, M. and Berg, P. (1991). *Genes and Genomes : A Changing Perspective*. Blackwell Scientific Publications, USA.

**Human Cytogenetics and Molecular Genetics  
(Practical)****Time: 3 Hrs.****Marks: 50**

To study the dermatoglyphics of palmar prints and finger ball. Karyotyping of solid-stained and G-banded chromosome preparations, chromosome nomenclature numericals, monstration of short-term peripheral blood lymphocyte cultures. To do numericals on pedigree analysis. Blood grouping from erythrocytes, blood grouping from blood stains, saliva stains and urine stains by absorption-inhibition and absorption elution methods. Demonstration of native polyacrylamide gel electrophoresis (PAGE), sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE). Determination of ABH sector status from saliva by absorption inhibition method, spectrophotometric analysis of some biomolecules, thin layer chromatography (TLC).

**BIOINFORMATICS (VOCATIONAL)****Scheme of Courses**

| <b>Title</b>    |   | <b>Credit</b> | <b>Marks</b> |
|-----------------|---|---------------|--------------|
| <b>Hours</b>    |   |               |              |
| <b>Paper–A:</b> | <b>Structural Biology and Molecular Modeling</b>          | <b>2</b>      | <b>40</b>    |
| <b>Paper–B:</b> | <b>Computational Methods for Sequence Analysis</b>        | <b>2</b>      | <b>40</b>    |
| <b>Paper–C:</b> | <b>Lab in Structural Biology and Molecular Modeling</b>   | <b>4</b>      | <b>60</b>    |
| <b>Paper–D:</b> | <b>Lab in Computational Methods for Sequence Analysis</b> | <b>4</b>      | <b>60</b>    |
| <b>Paper–E:</b> | <b>On Job Training</b>                                    | <b>2</b>      | <b>-</b>     |
|                 | <b>Total</b>  | <b>14</b>     | <b>200</b>   |

**BIOINFORMATICS (VOCATIONAL)****Paper-A****Structural Biology and Molecular Modeling****Time: 2 Hrs.****Marks: 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**

Protein structure, Determination of X-ray diffraction. Conformational properties of proteins, Ramdchandron plot, secondary, super secondary, Tertiary and Quartnery Structure of protein. Isolation and purification of proteins, Phase determination, Interpretation of electron density. Electron crystallography of proteins.

**UNIT-II**

NMR spectroscopy, Mass Spectroscopy, capillary electrophoresis, Statistical method of Chou and fasman.

**UNIT-III**

Classification of three dimensional structures of proteins, Prediction of structural classes, motifs folds and domains, classification of three dimensional structures in Brook haven protein data bank (HSSP, SCOP, FSSP, CATH)

**UNIT-IV**

Recent advance in drug design methodologies, biomolecular structure, structure activity relationship. structure based drug design.

**UNIT-V**

Molecular Modeling, quantum mechanical and molecular orbital methods, Empirical forcifields for trimolecular simulations, Molecular Dynamics simulations techniques for efficient conformational search: simulated annealing. Calculation of relative free energy using simulation techniques.

**List of Books:**

1. Broune P.E. and Weissig H. (Eds) Structural Biology. John Willey and Sons. N.J. USA (2002).
2. Creighton T.E. Protein Structure and Molecular Properties. W.H. Freeman and Company. (2001).
3. Martin R.B. Introduction to Biophysical Chemistry. McGraw Hill New York.



**BIOINFORMATICS (VOCATIONAL)****Paper-B****Computational Methods for Sequence Analysis****Time: 2 Hrs.****Marks: 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**

Analysis of DNA and Protein Sequences – *Distributions, frequency statistics, pattern and motif searches*, randomization – sequence segmentation.

**UNIT-II**

Sequence Alignment: Scoring matrices–PAM and BLOSUM–Local and Global alignment concepts–dynamic programming methodology–Needleman and Wunsch algorithm, Smith Waterman algorithm–Statistics of alignment score–Multiple Sequence alignment–Progressive alignment–Database searches for homologous sequences–Faster and Blast versions.

**UNIT-III**

Fragment assembly–Genome sequence assembly–Gene finding methods: concept and signal methods–Background of transform techniques–Fourier Transform and Gene Prediction–Analysis and prediction of regulatory regions.

**UNIT-IV**

Neural Network concepts and secondary structure prediction. Probabilistic models: Markov chain–random walk– Hidden Markov models – Gene identification and other applications.

**UNIT-V**

Evolutionary analysis: Distances – Clustering Methods – Rooted and un-rooted tree representation – Bootstrapping strategies.

**List of Books:**

1. Waterman M.S. (Eds). *Introduction to Computational Biology: Maps, sequence and genome*. Chapman and Hill. London, (1995).
2. Yop T.K., Frieder O, Martino R.L., *Hogh Performance computation methods for biological sequence analysis*. Kluver Academic Publishers, Dordrecht. (1996).
3. Suhai (Eds). *Theoretical and computation methods in genome research*. Plenum Press, New York (1997).
4. Durbin R, Eddy S.R., Krogh A, Mitchison G, *Biological sequence analysis. Probablistic models of proteins and nucleic acid*. Cambridge University Press (1998).
5. Schulze K.S., *Molecular Bioinformatics: counselling and application*. Walterde Gruyter Berlin New York (1995).
6. Setubal J, Meidanis J, *Introduction to Computational Molecular Biology*. PWS Publishing Company. Boston (1996).
7. Gusfield D. *Algorithms on strings, stress, trees and sequence*. Computer Science and Biology. Cambridge University Press, Cambridge (1997).
8. Bishop M.J., Rawling C.J. (Eds). *DNA and Protein Sequence analysis. A Practical Apporach*. IRL Press. Oxford (1997).

**BIOINFORMATICS (VOCATIONAL)**  
**Paper-C**  
**Lab in Structural Biology and Molecular Modeling**

**Time: 4Hrs.**

**Marks: 60**

**Practical:-**

To carry out molecular dynamics on a protein.

To carry out rigid body docking between two given molecules e.g. protein-protein, protein nucleic acid, protein-ligand etc.

To analyze protein sequence using Secondary Structure prediction Methods: GOR, CHOU-FASMAN

To retrieve various structures of Proteins from RCSB, their Classification systems using CATH/SCOP etc.

**BIOINFORMATICS (VOCATIONAL)**  
**Paper-D**  
**Lab in Computational Methods for Sequence Analysis**

**Time: 4Hrs.**

**Marks: 60**

**Practical:-**

Evolutionary Analysis prediction Program: - Phylip, R–Package, MacClade, COMPARE  
4.5

**Paper – E**  
**On Job Training**

**Time: 2 Hrs.**

**MICROBIAL & FOOD TECHNOLOGY****Paper-A****Applied Microbiology-I****Time: 3 Hours****Mark: 75****Instructions 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**

Microorganisms in industry: Historical development definition and scope of industrial microbiology; contribution of Pasterns in fermentation; sources of industrial microorganisms, essential characteristics, natural habitats, cultural collections and preservation of stock cultures.

**Unit-II**

Screening of microorganisms: Isolation of industrially important microorganisms, Screening of useful yeast, Bacteria and Fungi. Fermentation Media: Composition of Production Media, characteristics of an Ideal Production Medium, Raw Materials.

**Unit-III**

Fermentation and fermentation processes: Fermentation as biological activities types of industrial fermentation's (sub-merged, solid state and continuous fermentation). Design of Fermentor (Body Construction, Aeration and Agitational and Control of Septic Conditions), Basics of Batch Culture, Fed-Batch Culture and Continuous Culture.

**Unit-IV**

Recovery and purification of fermentation products: General principles of separation of fermentation products, solid particles, foam separation, separation by filtration, centrifugation, cell disruption, solvent extraction, ion-exchange chromatography.

**Books Recommended:**

1. Casida, L.E. 1991. Industrial Microbiology. Wiley Eastern Ltd., New Delhi.
2. Stanbury, P.F. Whitakker, A. and Hall S.J. 1995. Principles of Fermentation Technology. Elsevie Science Ltd., U.K.
3. Patel, A.H. 1984. Industrial Microbiology, Macmillan India Ltd., Delhi.
4. Trevan M.D., Daffey, S., Goulding, K. H. and Stanberry, P. 1988. Biotechnology: The Biological Principles, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
5. Rose A.H. 1961, Industrial Microbiology, Butterworths, Washington.

**MICROBIAL & FOOD TECHNOLOGY****Paper-B****Quality Control of Foods Products****Time: 3 Hours****Mark: 75****Instructions 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**

Definitions of Quality, Quality control, Total Quality Management, Quality Assurance. Organization of quality control department & its relation with other departments of industry system and development of HACCP, GMP guidelines.

**Unit-II**

Food Laws, Grades & Standards, PFA, FPO, BIS, SWMA, Export (Quality Control & Technology) act, AGMARK, ISO 9000 standards, consumer Production Act. Sugar control order, vanaspati order, Meat Food Products order.

**Unit-III**

Methods for microbiological examination of foods, (Direct examination, cultural techniques), enumeration methods, Alternate indirect methods (dye reduction, electrical, ATP), rapid methods for detection of specific organisms & toxins (immunological/molecular methods).

**Unit-IV**

Chemical analysis of cereals, milk, eggs, meat, fruits & vegetables. Sensory analysis–General testing conditions, taste, odor, aroma & other senses. Descriptive, Discrimination & Acceptance tests Taint tests, Layout & requirements of sensory test laboratory. Types of panels the requirements of panel members.

**Recommended Books:**

1. Jelling, Gisela. Sensory evaluation of food theory & quality control for fruits & vegetable products, 2nd Edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
2. Krammer A & Twigg B.A. Quality Control in Food Industry Vol. I.
3. Krammer A & Twigg B.A. Quality Control in Food Industry Vol. II.
4. Hayes P.R. (1992). Food Microbiology & Hygiene Elsevier Science Publishers Ltd., England.
5. Aurand L.W. & Wood A.E. Food Composition & Analysis.

**MICROBIAL & FOOD TECHNOLOGY**  
**Practicals-III****Time: 4 Hours****Marks: 50**

1. Platform tests for milk
2. Detection of additives/preservatives/neutralizers in milk.
3. Determination of fat, TS & SNF in milk.
4. Physical examination of cereals.
5. Proximate composition of wheat flour.
6. Microbiological examination of milk by MBRT & SPC.
7. Determination of % salt and reducing sugars in fruits & vegetable products.
8. Grading of eggs by candling.
9. Cut out examination of a canned food product & sensory analysis.
10. Determination of % gluten content & SDS value of wheat flour.
11. Isolation of bacteria, fungi from soil.
12. Isolation of amylase producing microorganisms from soil.
13. Isolation of yeast from fruits and flowers.
14. To study the growth curve of yeast.
15. Production of alcohol, lactic acid and yogurt.

**MATHEMATICS****Paper-I****Numerical Analysis****Time: 3 Hours****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 students 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.
4. The students can use Non-programmable scientific calculator in the paper of Numerical Analysis of B.A./B.Sc. Part-III.

**Section-A**

Error generation, propagation, error estimation and error bounds, Solution of non-linear equations, Bisection method, Iteration method, Newton's Method, Generalized Newton's Method, Method of false position, Muller's method, Rate of convergence of these methods.

Solution of linear system of equation; Direct method, Gauss elimination variant (Gauss Jordan and Crout reduction), Triangular Method, Iterative Method, Jacobi's Method, Gauss Seidel Method.

Finite Differences: Forward, Backward, Central, Divided differences, shift operator, relationship between the operators and detection of errors by use of difference operator.

**Section-B**

Interpolation with divided difference, Newton's formula, Lagrangian Method, Finite difference interpolation, Gauss formula, Stirling formula, Bessel's formula, Error Estimation Extrapolation. Method of least squares for curve fitting, Fitting of straight line, exponential and power curve, fitting of polynomial. Numerical differentiation, Method based on interpolation. Numerical Integration, Trapezoidal rule, Simpson's rule, Weddle rule, Romberg Integration, Gaussian integration method, Gaussian legendre integration. Double numerical integration.

Numerical solution of ordinary differential equations, Equations of first and second order, System of simultaneous equations, Milne's Method, Runge-Kutta Method. Predictor- Corrector Methods.

**Books Recommended:**

1. Scarborough: Numerical Mathematical Analysis (6th edition).
2. S.S. Sastry: Introductory Methods of Numerical Analysis, 2003 (3rd Edition), Prentice Hall of India.
3. R.S. Salaria: Computer Oriented Numerical Methods, 2007, Khanna Book Co. Publishing Co. (P) Ltd.
4. A. Maritava Gupta and Subash Ch. Bose: Introduction to Numerical Analysis.



**MATHEMATICS**  
**Paper-II**  
**Linear Algebra and Number Theory**

**Time: 3 Hours**

**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 students 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**

Definition of groups, rings and fields with illustrations. Definition of vector spaces, subspaces with examples. Direct sum of subspaces. Linear span, Linear dependence, Linear independence of vectors. Linear combination of vectors, Basis of a vector space, Finitely generated vector spaces. Existence theorem for basis. Invariance of the number of elements of the basis set. Dimension of sum of two subspaces. Quotient space and its dimension.

**Section-B**

Linear transformation. Algebra of linear transformation. Rank- Nullity theorem, Isomorphism and Isomorphic spaces, Matrix of a linear transformation. Changes of basis, Linear operator. The division algorithm, The greatest common divisor, The Euclidean algorithm, The Diophantine equation  $ax + by = c$  Prime numbers and their distribution, The fundamental theorem of arithmetic, Basic properties of congruences, Linear congruences and the Chinese remainder theorem (statement only), The Fermat's theorem, Wilson's theorem, Euler's Phi function, Euler's theorem, some properties of the Phi Function.

**Books Recommended:**

1. K.Hoffman & R. Kunze, Linear Algebra, 2nd Edition, Prentice Hall, New Jersey, 1971.
2. V. Krishnamurthy, V. P. Mainra and J.L. Arora, An Introduction to Linear Algebra, East West Press.
3. Shanti Narayan & P.K. Mittal, A Text Book of Matrices, 10th Edition (2002), S. Chand & Co.
4. D. Burton, Elementary Number Theory, Sixth Edition, McGraw-Hill. (Scope in Chapters 2-5, 7-12)
5. I. Niven, H. Zuckerman, and H. Montgomery, An Introduction to the Theory of Numbers, Fifth Edition, John Wiley and Sons.

**MATHEMATICS****Paper-III  
Mechanics****Time: 3 Hours****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 students 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**

Basic concepts, composition and resolution of forces (parallelogram law, polygon law, Lami's Theorem, (l-m) theorem. Resultant of a number of coplanar forces, parallel forces.

Moments: Varignon's theorem of moments, Generalized theorem of moments, Couples Resultant of two Coplanar Couples, Equilibrium of two coplanar couples, Resultant of a force and a couple. Equilibrium of coplanar forces. Friction, Laws of friction, Equilibrium of a particle on a rough plane. Centre of Gravity (C.G.); Basic concepts of C.G. of a rod, triangular lamina solid hemisphere, hollow hemisphere, solid cone and hollow cone.

**Section-B**

Basic concepts, rectilinear motion in a straight line with uniform acceleration, Newton's laws of motion. Motion of two particles connected by a string. Motion along a smooth inclined plane. Variable acceleration. Simple Harmonic Motion. Curvilinear motion of particle in a plane, Definition of velocity and acceleration projectiles. Oscillations : Free Vibrations, Simple Pendulum, Conical Pendulum. Work, Power and Energy: Kinetic and Potential energy, Conservative forces. Theorem of conservation of energy. Work done against gravity.

**Books Recommended:**

1. S.L. Loney, Statistics, Macmillan and Company, London.
2. R.S. Verma, A Text Book on Statistics, Optical Pvt. Ltd., Allahabad.
3. S.L. Loney, An Elementary Treatise on the Dynamics of a Particle and of Rigid Bodies, Cambridge University Press, 1956.

**STATISTICS**  
**Paper-A**  
**DESIGN AND SAMPLING**

**Time: 3 Hours****Marks: 100**

- Note:** 1. The candidates are allowed to use Non-Programmable calculators.  
2. Question paper may consist of two sections. Each section will consist of five questions set from corresponding section of the syllabus.  
3. The student will attempt five question in all selecting at least two questions from each section.  
4. Teaching time for statistics 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**

Linear models, the fixed effect models, the distribution of minimum error sum of squares and the conditional minimum error sum of squares, tests of general linear hypotheses.

Analysis of one way classified data under the fixed effect model. Analysis of the two way classified data with one observation per cell under the fixed effect models, Analysis of the two way classified data with multiple but equal observation in cell under the fixed effect models, expectations of various mean sum of squares in one way and two way classified data.

Terminology in experimental designs, basic principles of design of experiment randomization, replication and local control, completely randomized design, randomized block design and the latin square design, balanced incomplete block design and their advantages, disadvantages and analysis.

**Section-B**

Factorial experiments the concept of main effects and interactions in 22 and 23 factorial experiments and the sum of squares due to them. Yates method of computing the sum of squares due to the main effects and interactions 22 and 23 factorial design, statistical analysis of these experiments (excluding confounding).

Introduction to design of sample surveys, census and sample surveys, basic principles of sample surveys, planning a sample survey, sampling and non sampling errors.

Simple random sampling, (WR and WOR) estimation of mean, its variance and estimation of proportion, stratified random sample (WOR): estimation of mean, its variance and estimate of its variance (under WOR), proportional. Neyman and optimum allocation ratio, product and regression estimates of population mean and their comparison, large sample expressions of their variances, under WOR, comparison with mean per unit estimate. (under WOR)

**Books Recommended:**

Goon, A.M., Gupta, M.K. and Dasgupta, B. Fundamentals of Statistics, Vol. II, World Press, 2005.

Singh, D. and Chaudhary, F.S., Theory and Analysis of sample survey design, New Age International Publisher, 2002.

Chapter : 1 (excluding 1.11, 2.2.5, 2.6, 2.7), 3 (excluding 3.10-3.15), 6 (excluding 6.6-6.11), 7 (excluding 7.5, 7.6)

**Books Suggested for Supplementary Reading:**

Mukhopadhyar, P., Theory and Methods of Survey Sampling, Prentice Hall, 2000.

Das, M.N. and Giri, N.C. Design and Analysis of Experiment, New Age International Publisher, 2003.

Gupta, S.C. and Kapoor, V.K., Applied Statistics, Sultan Chand and Company, 2007.

**Paper-B  
Statistics****Time: 3 Hours****Marks: 100**

- Note:** 1. The candidates are allowed to use Non-Programmable calculators.  
2. Question paper may consist of two sections. Each section will consist of five questions set from corresponding section of the syllabus.  
3. The student will attempt five question in all selecting at least two questions from each section.  
4. Teaching time for statistics 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**

Introduction to index number, problems in the construction of index numbers, laspyeres, passche's, Drobish-Bowley, Walsh Marshal-Edgeworth and Fisher's formulae for index numbers, errors in index numbers, various tests for the criterion of a good index numbers, chain index number, cost of living index numbers, uses of index numbers.

Introduction of time series, the four components of a time series, measurement of secular trend by graphic method, method of semi averages, the method of moving averages and fitting of mathematical curves, measurement of seasonal fluctuations by method of simple averages, ratio to moving average, ratio to trend and link relative methods, measurement of cyclical fluctuations (excluding periodogram analysis).

**Section-B**

Vital statistics, data for vital statistics, rate of vital events, measurement of mortality, crude, specific and standardized death rates, cause of death, infant Mortality. Fertility rates. Measurement of fertility, crude birth rate, general fertility rate, age specific fertility rate and total fertility rates. Measurement of population growth, growth reproduction rate and net reproduction rate.

Statistical quality control: chance and assignable causes, process and product control, the techniques of control charts for process control, three sigma limits and specification limits. Schewharts Control charts for mean, S.D. and Range, Control Chart for number of defective and fraction defective, control charts for number of defects. Advantages of process control, sampling inspection by attributes for product control, the concept of producer's and consumer's risks, AQL, CTPD, AOQL, A.SN, ATI and OC functions and curves, single and double sampling plans.

**Book Recommended:**

Goon, A.M., Gupta, M.K. and Dasgupta, B., Fundamentals of Statistics, Vol.-II, World Press, 2005.

**Books Suggested for Supplementary Reading:**

Medhi, J., Statistical Methods. New Age International Publishers, 2000.

Nagar, A.L. and Das, R.K., Basic Statistics, Oxford University Press, 2005.

Gupta, S.C. and Kapoor, V.K., Applied Statistics, Sultan Chand and Company, 2007.

**APPLIED STATISTICS****Paper-A****Estimation and Testing of Hypothesis****Time: 3 Hours****Max. Marks: 100**

- Note:** 1. The candidates are allowed to use Non-Programmable calculators.  
2. Question paper may consist of two sections. Each section will consist of five questions set from corresponding section of the syllabus.  
3. The student will attempt five question in all selecting at least two questions from each section.  
4. Teaching time for statistics 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**

Estimators and estimates, unbiased, consistent, efficient estimators. Estimation Method based on moments, Maximum likelihood estimators for the parameters of Binomial, Poisson Hyper geometric and Normal Exponential Uniform distribution.

Confidence intervals, Tests of a statistical hypothesis, two types of errors, power of test. Tests for the parameter of the Binomial, Poisson and normal distributions, Chi-square tests: Test of goodness of fit, Test of independence of attributes, Ztransformation of the sample correlation, tests regarding the population correlation coefficient based on the Z-transformation. Non parametric test. Test of randomness, Wilcoxon and sign tests.

**Section-B**

Principles for design of experiments: randomization, replication and local control. Completely randomized and randomized blocks design. Estimates of main effects, tests of significance for equality of effects.

Multivariate Techniques (upto 4 variable only) : Introduction of multivariate normal distribution, maximum likelihood estimators of mean vector and variance, covariance matrix of multivariate normal distribution, multiple regression, multiple correlation and partial correlation.

**Book Prescribed:**

Goon, Gupta and Das Gupta: Fundamental of Statistics, Vol. I and II, World Press, 2005.

**Books Suggested for Supplementary Reading:**

Hogg. R.V., Mckean, 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.

**APPLIED STATISTICS****Paper-B****Economic and Industrial Statistics****Time: 3 Hours****Max. Marks: 100**

- Note:** 1. The candidates are allowed to use Non-Programmable calculators.  
 2. Question paper may consist of two sections. Each section will consist of five questions set from corresponding section of the syllabus.  
 3. The student will attempt five question in all selecting at least two questions from each section.  
 4. Teaching time for Statistics 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**

Sampling: Sample random (WOR/WR) and Stratified sampling, proportional and allocation and Optimum allocation in stratified sampling. Ratio and regression estimates of population mean.

Introduction of Index numbers: Index numbers-as weighted average, laspyeres, Passche's Drobish-Bowley, Waslsh, Marshal- Edgworth and Fisher's formulae for index numbers, Quantity index numbers, Tests for the ideal index numbers. Chain index number. Introduction of Time series: The four components of a time series, moving average, the Slutsky-Yule effect, determination of trend by curve fitting and moving average methods. Determination of seasonal variation.

**Section-B**

Quality control: Construction use and interpretation of control charts for mean, range, fraction, defective, and number of defects. Single, sampling inspection plans, Concepts of Producer's and consumer's risks, O.C. and AOQ, O.C. curves.

Vital Statistics: Rates and ratios, crude death rate, age specific death rate, infant mortality rate, Standardized death rates, direct and indirect methods. Measurement of fertility, crude birth rate, general specific and total fertility rates, Standardized birth rates, Calendar year rates.

**Book Prescribed:**

Goon, A.M. Gupta, M.K. and Dasgupta: Fundamental of Statistics, Vol. II, World Press, 2005.

**Books Suggested for Supplementary Reading:**

Medhi, J. Statistical Methods: An Introductory Text, New Age International Publications, 2000.

Nagar, A.L. and Das, R.K. Basic Statistics, Oxford University Press, 2005.

Gupta, S.C. and Kapoor, V.K. Applied Statistics, Sultan Chand and Company, 2007.

**PHYSICS****Note:**

1. There will be three papers of theory and one laboratory (Practical) course.
2. The Number of lectures per week will be three for each theory paper.
3. The number of lectures per week will be six for practical.
4. The examination time for each theory paper will be three hours.
5. The examination time for practical will be four hours.
6. The use of non-programmable calculators will be allowed in the examination center but these will not be provided by the university/college.

|                 | <b>Title</b>                                   | <b>Total<br/>Marks</b> | <b>Total<br/>Teaching<br/>Hours</b> |
|-----------------|--|------------------------|-------------------------------------|
| <b>Paper-A:</b> | <b>Condensed Matter Physics</b>                | <b>50 Marks</b>        | <b>60</b>                           |
| <b>Paper-B:</b> | <b>Electronics and<br/>Solid State Physics</b> | <b>50 Marks</b>        | <b>60</b>                           |
| <b>Paper-C:</b> | <b>Nuclear and Particle Physics</b>            | <b>50 Marks</b>        | <b>60</b>                           |
|                 | <b>Physics Practical</b>                       | <b>50 Marks</b>        | <b>90</b>                           |

**Each theory paper will consist of five Units.**

**Unit-I:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-II:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-III:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-IV:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-V:** There will be one question comprising of eight parts (each carrying 2 marks) of small answer type covering the syllabi of all these four Units (Units-I-IV). Out of these, five parts are to be attempted.

**PHYSICS****Paper-A****Condensed Matter Physics****Total Teaching Hours: 60****Marks: 50****Time: 3 Hours****Pass Marks: 35%****The paper will consist of five units.**

**Unit-I** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-II** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-III** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-IV** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-V** There will be one question comprising of eight parts (each carrying 2 marks) of small answer type covering the syllabi of all these four Units (Units-I-IV). Out of these, five parts are to be attempted.

**Unit-I**

Crystal structure, Symmetry operations for a two dimensional crystal, Two dimensional Bravais lattices, Three dimensional Bravais lattices, Basic primitive cells, Crystal planes and Miller indices, Diamond and NaCl structure.

**Unit-II**

Crystal Diffraction: Bragg's law, Experimental methods for crystal structure studies, Laue equations, Reciprocal lattices of SC, BCC and FCC, Bragg's law in reciprocal lattice, Brillouin zones and its derivation in two dimensions, Structure factor and atomic form factor.

**Unit-III**

Lattice vibrations, Concepts of phonons, Scattering of neutrons by phonons, Vibration and mono-atomic, linear chains, Density of modes, Einstein and Debye models of specific heat, Free electron model of metals, Free electron, fermi gas and Fermi energy.

**Unit-IV**

Band Theory: Kronig-Penney model, Metals and insulators, Conductivity and its variation with temperature in semiconductors, Fermi levels in intrinsic and extrinsic semiconductors, Qualitative discussion of band gap in semiconductors, Superconductivity, Magnetic field effect in superconductors, BCS theory, Thermal properties of superconductors.

**Books Suggested:**

1. Introduction to Solid State Physics by C. Kittel (Wiley Eastern)
2. Elements of Modern Physics by S.H. Patil (TMGH, 1985).
3. Solid State Physics by Puri and Babbar.



**PHYSICS****Paper-B****Electronics and Solid State Physics****Total Teaching Hours: 60****Marks: 50****Time: 3 Hours****Pass Marks: 35%****The paper will consist of five units.**

**Unit-I:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-II:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-III:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-IV:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-V:** There will be one question comprising of eight parts (each carrying 2 marks) of small answer type covering the syllabi of all these four Units (Units-I-IV). Out of these, five parts are to be attempted.

**Unit-I**

Concepts of current and voltage sources, p-n junction, Biasing of diode, V-A characteristics, Zener diode, LCD to ICD rectification: half wave, full wave rectifiers and bridge rectifiers, Filter circuits (RC, LCp filters), Efficiency, Ripple factor, Voltage regulation, Voltage multiplier circuits.

**Unit-II**

Junction transistor : Structure and working relation between different currents in transistors, Sign conventions, Amplifying action, Different configurations of a transistor and their comparison, CB and CE characteristics, Structure of JEFT and MOSFET, Transistor biasing and stabilization of operating point, Fixed bias, Collector to base bias, Bias circuit with emitter resistor, Voltage divider biasing circuit.

**Unit-III**

Working of CE amplifier, Amplifier analysis using hparameters, Equivalent circuits, Determination of current gain, Power gain, Input impedance, FET amplifier and its voltage gain, Operational amplifier, Characteristics and applications, Feed back in amplifiers, Different types, Voltage gain, Advantage of negative feed back, Emitter follower as negative feed back circuit.

**Unit-IV**

Barkhausen criterion of sustained oscillations, LC oscillator (tuned collector, tuned base Hartley), RC oscillators, phase shift and Wein bridge, Modulation and detection, AM and FM, Power in AM and generation of AM detector, Radio transmitter, Radio wave propagation, Ionosphere, Radio receiver, TV receiver.

**Books Suggested:**

1. Basic Electronics and Linear Circuits by N.N. Bhargave, D.C. Kulshreshtha and S.C. Gupta.
2. Foundations of Electronics by D. Chatopadhyay, P.C. Rakshit, B. Saha and N.N. Purkit.
3. Basic Electronics by D.C. Tayal (Himalaya Pub.)

**PHYSICS**  
**Paper-C**  
**Nuclear and Particle Physics**

**Total Teaching Hours: 60**  
**Time: 3 Hours**  
**Pass Marks: 35%**

**Max. Marks: 50**

**The paper will consist of five units.**

**Unit-I:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-II:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-III:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-IV:** There will be two questions from this section. Each question will carry 10 marks. Only one question is to be attempted.

**Unit-V:** There will be one question comprising of eight parts (each carrying 2 marks) of small answer type covering the syllabi of all these four Units (Units-I-IV). Out of these, five parts are to be attempted.

**Unit-I**

Constituents of nucleus and their intrinsic properties, Qualitative facts about size, mass, density, energy, charge, Binding energy, angular momentum, magnetic moment and electric quadrupole moments of the nucleus, Wave mechanical Properties of nucleus, Average binding energy and its variation with mass numbers, Properties of nuclear forces and saturation, Non-existence of electrons in the nucleus and neutron-proton model, Assumptions of liquid drop model, Semi-empirical mass formula, Conditions of nuclear stability, Nuclear shell model. Experimental evidence of magic numbers and its explanation.

**Unit-II**

Radioactivity, Modes of decay and successive radioactivity, Alpha emission, Electron emission, Positron emission, Electron capture, Gamma-ray emission, Internal conversion, Qualitative discussion of alpha, beta and gamma spectra, Geiger-Nuttall rule, Neutrino hypothesis of beta decay, Evidence of existence of neutrino, Qualitative discussion of alpha and beta decay theories, Nuclear reactions, reaction cross section, Conservation laws, Kinematics of nuclear reaction, Q-value and its physical significance, Compound nucleus, Possible reaction with high energy particles.

**Unit-III**

Energy loss due to ionization (Bethe Bloch formula), Energy loss of electrons, Bremsstrahlung, Gamma-ray through matter. Pair production, Radiation loss by fast electrons, Radiation length; Electron-positron annihilation; Cyclotron; Betatron, Qualitative discussion of Synchrotron; Collider machines and linear accelerator.

**Unit-IV**

Ionization chamber, Proportional counter, GM counter, Scintillation counter, Solid state detector's Elementary particles and their masses, Decay modes, Classification of these particles, types of interactions Conservation laws and quantum numbers, Concepts of isospin, Strangeness, Parity, Charge conjugation. Antiparticles, Gell Man methods, Decay and strange particles. Particle symmetry, Introduction to quarks and qualitative discussion of quark model.

**Books Suggested:**

1. An Introduction to Nuclear Physics by M.R. Bhiday and V.A. Joshi (Orient Longman).
2. Nuclear Physics by I. Kaplan (Addison-Wiley Pub. Inc.)
3. Nuclear Physics by S.S.M. Wong.
4. Concepts of Nuclear Physics by B.L. Cohen (TMI Ed.)
5. Particle Physics, M.P. Khanna, (Prentice Hall of India)
6. Nuclear Physics by Burcham (Indian Ed.)
7. Introduction to Nuclear & Particle V.K. Mittal, R.C. Verma & S.C. Gupta P.H.I. (2009).

## PHYSICS PRACTICAL

**Total Teaching Hours: 90**

**Max. Marks: 50**

**Time: 4 Hours**

**Pass Marks: 35%**

### Guidelines for Physics Practical Examination

#### 1. The distribution of marks is as follows:

- |   |                 |
|---|-----------------|
| i. One full experiment requiring the students to take some data, analyse it and draw conclusions. (Candidates are expected to state their results with limits of error. | <b>20 Marks</b> |
| ii. Brief theory  | <b>5 Marks</b>  |
| iii. One exercise based on experiment or computer programming (to be allotted by the external examiner at the time of examination).                                     | <b>10 Marks</b> |
| iv. Viva-Voce   | <b>10 Marks</b> |
| v. Record (Practical file)  | <b>5 Marks</b>  |
2. There will be one session of 4 hrs. duration. The paper will have two sections.

(i) **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.

(ii) **Section-B** will consist of 6 exercises out of which at least two exercises should be based on computer which will be set by the setter. The length of the exercises should be such that any of these could be completed in one hour. Out of 6 exercises the examinee will mark 4 exercises, and one of them is to be allotted by the external examiner.

3. The examiner should take care that the experiment allotted to an examinee from Section-A and exercise allotted from Section-B are not directly related to each other.

4. Number of candidates in a group for practical examination should not exceed 12.

5. In a single group, no experiment be allotted to more than three examinees.

### List of Experiments

#### I. Condensed Matter Physics:

##### Activities:

- i. Measurement of reverse saturation current in p-n-junction diode at various temperatures and to find the approximate value of energy gap.
- ii. To draw forward and reverse bias characteristics of a p-n junction diode and draw a load line.
- iii. Study of a diode as a clipping element.
- iv. To measure the magnetic susceptibility of FeCl<sub>2</sub> solution by Quincke's Method.
- v. To trace the B-H curves for different materials using CRO and find the magnetic parameters from these.

#### II. Electronics and Solid State Devices:

- i. To study the response of RC circuit to various input voltage (square, sine and triangular).
- ii. To measure the efficiency and ripple factors for (a) Halfwave (b) full wave and (c) bridge rectifier circuits.
- iii. To study the reduction in the ripple in the rectified output with RC, LC  $\pi$  filters.
- iv. To draw the characteristics of a Zener diode.
- v. To study the stabilization of output voltage of a power supply with Zener diode.
- vi. To measure the plot Common Emitter Characteristics of a transistor (pnp or npn).
- vii. To plot Common Base Characteristics of and determine hparameters of a given transistor.
- viii. To draw output and mutual characteristics of an FET (Experiments) and determine its parameters.
- ix. To study the gain of an amplifier at different frequencies and to find Band width.
- x. To set up an oscillator and study its output on CRO for different C values.

**III. Nuclear and Particle Physics:**

- i. To draw the plateau of a GM counter and find its dead time.
- ii. To study the statistical fluctuations and end point energy of beta particles using GM counter.
- iii. To study the absorption of beta particles in aluminium using GM counter and determine the absorption coefficient of beta particles from it.
- iv. To study the characteristics of a thermistor and find its parameters.

**Exercise: Based on the above given experiments (i-x) and computer based exercises (xi-xviii) as given below:**

- i. To trace the output wave form of full wave and half wave rectifiers.
- ii. To trace the rectifier output with RC, LC and parallel filters.
- iii. To show the constant output voltage of Zener diode.
- iv. To study the band width of a transistor amplifier.
- v. To show the variation of resistance of a thermistor with temperature.
- vi. To find different frequencies using CRO.
- vii. Determine the plateau of a GM counter.
- viii. To study the absorption of beta particles in different materials like Pb, Fe, Al, etc. using GM counter.
- ix. To locate the peak position with gain of an amplifier of gamma ray spectrometer.
- x. To integrate a given function by Trapezoidal rule.
- xi. To integrate a given function by Simpson's rule.
- xii. Find real root of a given equation by Bisection method.
- xiii. Find the real root of a given equation by Newton-Raphson's method.
- xiv. Solve a first order differential equation by RK2 method.
- xv. Find first four perfect numbers.
- xvi. Find transpose of a given matrix and add and subtract given two matrices.
- xvii. Multiply a given matrix by a scalar constant and multiply given two matrices.
- xviii. Quadratic interpolation using Newton's forward difference formula of degree two.

**Text and Reference Books:**

1. A Laboratory Manual of Physics for Undergraduate Classes, D.P. Khandelwal.
2. B.Sc. Practical Physics by C.L. Arora.
3. Computer Programming-I by R.C. Verma, V.K. Mittal and S.C. Gupta, Vishal Publishers, Jalandhar, 2003.
4. FORTRAN 77 and Numerical Methods, C. Xavier (New Age Int. Pvt. Ltd., N. Delhi) 1996.
5. Computer Simulation in Physics by R.C. Verma, Anamaya Pub., N. Delhi, 2004.

**CHEMISTRY**

| Paper Course            | Teaching Hours   | Marks |
|-------------------------|------------------|-------|
| I. Inorganic Chemistry  | 60 3 period/week | 50    |
| II. Organic Chemistry   | 60 3 period/week | 50    |
| III. Physical Chemistry | 60 3 period/week | 50    |
| IV. Practicals          |                  | 50    |

**Paper-I**  
**Inorganic Chemistry**

Time: 3 Hrs

Marks: 50

The question paper shall consist of three parts as detailed below:-

**Part-A**

It shall consist of 10 very short answer type questions (Q. Nos. 1 to 10) from the entire syllabus and the maximum length of each question may not exceed 1/4th the 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: 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 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: 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: 10****Section-I****1. Metal-ligand Bonding in Transition Metal Complexes**

Limitations of valence bond theory, an elementary idea of crystal-field theory, crystal field splitting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal-field parameters.

**2. Magnetic Properties of Transition Metal Complexes**

Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula. L-S coupling, correlation of  $\mu_s$  and  $\mu_{eff}$  values, orbital contribution to magnetic moments, application of magnetic moment data for 3d-metal complexes.

**3. Thermodynamic and Kinetic Aspects of Metal Complexes**

A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, substitution reactions of square planar complexes.

**Section-II****4. Hard and Soft Acids and Bases (HSAB)**

Classification of acids and bases as hard and soft. Pearson's HSAB concept, acid base strength and hardness and softness. Symbiosis, theoretical basis of hardness and softness, electronegativity and hardness and softness.

**5. Bioinorganic Chemistry**

Essential and trace elements in biological processes, Biological role of alkali and alkaline earth metal ions with special reference to  $\text{Ca}^{2+}$ .

**6. Silicones and Phosphazenes**

Silicones and phosphazenes as examples of inorganic polymers, nature of bonding in triphosphazenes.

**Section-III****7. Electronic Spectra of Transition Metal Complexes**

Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states.

**8. Organometallic Compounds:**

Definition, nomenclature and classification of organometallic compounds. EAN rule, Preparation, properties, and applications of alkyls aryls of lithium and aluminium, Bonding in metal-ethylenic complexes, Mechanism of homogeneous hydrogenation reactions.

**CHEMISTRY****Paper-II: Organic Chemistry****Time: 3 Hrs.****Marks: 50****The question paper shall consist of three parts as detailed below:****Part-A**

It shall consist of 10 very short answer type questions (Q. Nos. 1 to 10) from the entire syllabus and the maximum length of each question may not exceed 1/4th the 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: 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 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: 30****Part-C**

It shall consist of 3 descriptive type questions (Q. Nos. 16 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: 10****Section-I****1. Spectroscopy**

Nuclear Magnetic Resonance (NMR) spectroscopy.

Proton Magnetic Resonance (<sup>1</sup>H NMR) spectroscopy,

nuclear shielding and deshielding, chemical shift and molecular structure, spin-spin splitting and coupling constants, areas of signals, interpretation of PMR spectra of simple organic molecules such as ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromoethane, ethyl acetate, toluene and acetophenone. Problems pertaining to the structure elucidation of simple organic compounds using UV, IR and PMR spectroscopic techniques.

**2. Electromagnetic Spectrum: Absorption Spectroscopy**

Ultraviolet (U.V.) absorption spectroscopy introduction- (Beer-Lambert law), molar absorptivity,  $\rho$ , analysis of UV spectra, types of electronic Transitions effect of conjugation. Concept of chromophores and auxochrome Bathochrome, hypsochrome, hyperchrome, hypochromic shifts- UV spectra of conjugated compounds Infrared (IR) Absorption spectroscopy-introduction Hooke's law, Selection rules, intensity and IR bands, measurement of IR spectrum time characteristic absorption of various fundamental bench interpretation of IR spectra of simple organic.

**Section-II****3. Organometallic Compounds**

Organomagnesium Compounds: The Grignard reagents formation, structure and chemical reactions.

Organozinc Compounds: Formation and chemical reactions.

Organolithium Compounds: Formation and chemical reactions.



#### 4. Organosulphur Compounds

Nomenclature, structural features, Methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidine.

#### 5. Heterocyclic Compounds

Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole.

Introduction to condensed five and six-membered heterocycles. Preparation and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis skrup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of indole, quinoline and isoquinoline.

### Section-III

#### 6. Synthetic Polymers

Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler-Natta polymerization and vinyl polymers.

Condensation or step growth polymerization. Polyesters, polyamides, phenol formaldehyde resins, urea formaldehyde resins epoxy resins and polyurethanes. Natural and synthetic rubbers.

#### 7. Organic Synthesis *via* Enolates

Acidity of  $\alpha$ -hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate.

Alkylation of 1,3-dithianes. Alkylation and acylation of enamines.

#### 8. Carbohydrates

Classification and nomenclature. Monosaccharides, mechanism of osazone formation, interconversion of glucose and fructose, chain lengthening and chain shortening of aldoses. Configuration of monosaccharides. Erythro and threo diastereomers. Conversion of glucose into mannose. Formation of glycosides, ethers and esters. Determination of ring size of monosaccharides. Cyclic structure of D(+)-glucose. Mechanism of mutarotation.

#### Structures of ribose and deoxyribose

An introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.

#### 9. Amino Acids, Peptides, Proteins and Nucleic Acids

Classification, structure and stereochemistry of amino acids. Acid-base behavior, isoelectric point and electrophoresis. Preparation and reactions of  $\alpha$ -amino acids.

Structure and nomenclature of peptides and proteins. Classification of proteins. Peptide structure determination, end group analysis, selective hydrolysis of peptides. Classical peptide synthesis, solid-phase peptide synthesis. Structures of peptides and proteins. Levels of protein structure. Protein denaturation/renaturation.

Nucleic acids : Introduction. Constituents of nucleic acids. Ribonucleosides and ribonucleotides. The double helical structure of DNA.



**CHEMISTRY****Paper-III: Physical Chemistry****Time: 3 Hrs.****Marks: 50****The question paper shall consist of three parts as detailed below:****Part-A**

It shall consist of 10 very short answer type questions (Q. Nos. 1 to 10) from the entire syllabus and the maximum length of each question may not exceed 1/4th the 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: 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 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: 30****Part-C**

It shall consist of 3 descriptive type questions (Q. Nos. 16 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: 10****Section-I****1. Elementary Quantum Mechanics**

Black-body radiation, Planck's radiation law, photoelectric effect, heat capacity of solids, Bohr's model of hydrogen atom (no derivation) and its defects. Compton effect.

De Broglie hypothesis, the Heisenberg's uncertainty principle, Sinusoidal wave equation, Hamiltonian operator, Schrodinger wave equation and its importance, physical interpretation of the wave function, postulates of quantum mechanics, particle in a one dimensional box.

Schrodinger wave equation for H-atoms, separation into three equations (without derivation) quantum numbers and their importance, hydrogen like wave functions, radial wave functions, angular wave functions.

Molecular orbital theory, basic ideas—criteria for forming M.O. from A.O. construction of M.O.'s by LCAO—H<sub>2</sub> + ion, calculation of energy levels from wave functions, physical picture of bonding and antibonding wave functions, concept of s, s\*, p, p\* orbitals and their characteristics.

Hybrid orbitals-sp, sp<sup>2</sup>, sp<sup>3</sup>, calculation of coefficients of A.O.'s used in these hybrid orbitals.

Introduction to valence bond model of H<sub>2</sub>, comparison of M.O. and V.B. models.

## Section-II

### 2. Spectroscopy

Introduction: Electromagnetic radiation, regions of the spectrum, basic features of different spectrometers, statement of the Born-Oppenheimer approximation, degrees of freedom.

### 3. Rotational Spectrum

Diatomic molecules. Energy levels of a rigid rotor (semiclassical principles), selection rules, spectral intensity, distribution using population distribution (Maxwell-Boltzmann distribution) determination of bond length, qualitative description of non-rigid rotor, isotope effect.

### 4. Vibrational Spectrum

Infrared spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effect of anharmonic motion and isotope on the spectrum, idea of vibrational frequencies of different functional groups.

Raman Spectrum: Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.

### 5. Electronic Spectrum

Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck-Condon principle.

Qualitative description of s, p, and n M.O., their energy levels and the respective transitions.

## Section-III

### 6. Photochemistry

Interaction of radiation with matter, difference between thermal and photochemical processes.

Laws of photochemistry: Grothus–Drapper law, Stark–Einstein law, Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non–radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions–energy transfer processes (simple examples).

### 7. Solid State

Definition of space lattice unit cell, Law of crystallography- (i) Law of constancy of interfacial angles, (ii) Law of rationality of indices, (iii) Symmetry elements in crystals.

X-ray diffraction by crystals. Derivation of Bragg's Law in Reciprocal space. Determination of crystal structure of NaCl, KCl by use of Powder method; Laue's method.

## Chemistry Practicals

**Duration: 3½ Hrs. each**  
**6 periods/week**

**Marks: 50**

### (I) Synthesis and Analysis

- (a) Preparation of Sodium trioxalatoferrate (III)
- (b) Preparation of Ni-DMG Complex
- (c) Preparation of Copper tetrammine complex
- (d) Preparation of cis-bisoxalatodiaquachromate (III) ion

### (II) Organic Chemistry

Laboratory Techniques

#### (a) Column Chromatography

- Separation of o & p nitrophenol
- Separation of Leaf pigments from Spinnach leaves
- Separation of o & p nitro aniline
- Separation of dyes.

#### (b) Synthesis of Organic Compounds

- Preparation of p-nitroacetanilide
- Preparation of p-bromoacetanilide
- Green Chemistry Experiment: Preparation of benzoic acid from Benzyl-using green approach.

Preparation of Methyl Orange, Methyl Red

#### To be substituted by Green Chemistry Experiment

Preparation of benzoic acid from benzyl-using green approach

### (III) Physical Chemistry

#### (a) Conductometric Titrations

- (i) Determine the end point of the following titrations by the conductometric method.

- Strong acid-Strong base
- Strong acid-Weak base
- Weak acid-Strong base
- Weak acid-Weak base

- (ii) Determine the composition of a mixture of acetic acid and hydrochloric acid by conductometric titration.

- (b) (i) Molecular Weight Determination of acetanilide, naphthalene, using camphor as solvent (Rast's methods)

- (ii) To Determine the molecular weight of a polymer by viscosity measurements.

#### (c) Adsorption

- (i) To study the adsorption of acetic acid oxalic/acid from aqueous solutions by charcoal.

#### (d) Phase Equilibria

To determine the distribution coefficient of iodine between CCl<sub>4</sub> and water.

#### (e) Refractometry

- (i) Determination of refractive index of a liquid by Abbe refractometer, and hence the specific and molar refraction.

- (ii) To determine the composition of unknown mixture of two liquids by refractive index measurements.

#### (f) Colorimetry

To test validity of Beer-Lambert Law using a colorimeter and determine unknown concentration of the solution.

| <b>Practical Examination</b>         |  | <b>Marks</b> |
|--------------------------------------|--|--------------|
| <b>Paper-A (Evening)</b>             |  |              |
| 1. Preparation of Inorganic compound |  |              |
| 10                                   |  |              |
| 2. Column Chromatography             |  | 10           |
| <b>Paper-B (Morning)</b>             |  |              |
| 1. Preparation of Organic Compound   |  |              |
| 10                                   |  |              |
| 2. Physical Chemistry experiment     |  | 10           |
| 3. Viva Voce                         |  | 06           |
| 4. Note Book                         |  | 04           |

**Instructions:** For all Practical examinations books are not allowed.

**For Physical Experiment**

Students shall be allowed to tick two experiments out of the three offered. The examiner will allocate one experiment out of two ticked experiments

**Note:** Book/Books are not allowed during writing.

**For Preparations and Column Chromatography**

Students are to write chemical requirements, chemical equation and brief procedure in first 15 minutes.

**Early Childhood Care and Education  
(Vocational)****Instructions for the Paper Setters:**

1. Question paper should be set strictly according to the syllabus.
2. The language of the question paper should be straight and simple.
3. Theory paper should consist of three parts.
4. The question paper should cover the whole syllabus.

**Section-A** will consist of 10 very short answer questions with answer to each question in five lines (100 words) in length. All questions will be compulsory. Each question will carry 2 marks and the total weightage of the section being **20 marks**.

**Section-B** will consist of short answer questions with answer to each question in two pages (250 words) in length. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry 6 marks and the total weightage of the section being **48 marks**.

**Section-C** will consist of essay type questions with answer to each question upto five pages (1000 words) in length. Four questions will be set by the examiner and the candidates will be required to attempt two questions. Each question will carry 16 marks and the total weightage of the section being **32 marks**.

## Early Childhood Care and Education (Vocational)

**Time: 3 Hours****Marks: 100****Theory Periods/week: 4****Distribution of Marks:**

|  |          |
|--|----------|
| Assignment   | 10 Marks |
| Practical Note Book  | 15 Marks |
| Written examination  | 15 Marks |
| Oral examination   | 20 Marks |
| Internal Assessment  | 20 Marks |
| Preparation of 2 play materials from indigenous/waste products | 20 Marks |
| <b>Total Marks: 100</b>  |          |

### Scheme of Course

| Scheme of Examination    | Time           | Marks      | Lectures/Week |
|--------------------------|----------------|------------|---------------|
| <b>Paper-A Theory</b>    | <b>3 Hours</b> | <b>100</b> | <b>6</b>      |
| <b>Paper-B Practical</b> | <b>3 Hours</b> | <b>100</b> | <b>4</b>      |

**Early Childhood Care and Education**  
**(Vocational)**  
**Paper-A**  
**THEORY**

**Time: 3 Hours**

**Marks: 100**

**Integration in Early Childhood Care and Education:**

Identification of children with special needs; integration with normal children.

**Roles and Responsibilities of Staff:**

Administration and supervision; qualities of a good teacher (personal and professional) and supervisory staff.

Capacity Building in Staff:

**Community Outreach Programmes:**

Parent and community involvement and PTA and the other Programmes.

**Issue Related to Early Childhood Care and Education:**

Global issues & specific issues related to India. Future Trends in Early Childhood Care and Education.

**Paper-B**

**Practicals**

**Time: 3 Hrs.**

**Marks: 100**

- \* Use of appropriate psychological tools to identify developmental needs of children with special needs.
- \* Organizing a Parent Education Programme.
- \* Formation of PTA.
- \* Working out strategies for community involvement in ECE programmes.

**References:**

1. Swaminathan, Mina. The First Five Years: A critical perspective on Early Childhood Care and Education in India, Sage Publications, New Delhi.
2. Government of India 1986. A Guide Book for Anganwadi Workers, New Delhi: Department of Women and Child Development, Ministry of Human Resource Development.
3. Sciarra, D.A. and Dorsery, A.G. 1979. Developing and Administering a Child Care Centre, Houghton Mifflin Company, Boston.

**Clinical, Nutrition and Dietetics (Vocational)**

|  | <b>Theory<br/>Periods</b> | <b>Practical<br/>Periods</b> |
|--|---------------------------|------------------------------|
| <b>Paper-A</b><br><b>Advanced Dietetics and Clinical Nutrition</b>                 | <b>4</b>                  | <b>2/group/week</b>          |
| <b>Paper-B</b><br><b>Food Service Equipment Layout and<br/>Community Nutrition</b> | <b>4</b>                  | <b>2/group/week</b>          |

**Note:** For “On the Job Training” the students are required to:-

- Complete 10 days visit to hospitals to study the nutritional deficiency give advice and
- Each student to run one diet clinic in the institution during B.Sc. Part-III.

**Clinical Nutrition and Dietetics (Vocational)**

| <b>Paper</b>  | <b>Theory<br/>Duration</b> | <b>Marks.</b> | <b>Practical<br/>Duration</b> | <b>Int.<br/>Asst.</b> | <b>Grand<br/>Ass.</b> | <b>Marks.<br/>Total</b> |
|---|----------------------------|---------------|-------------------------------|-----------------------|-----------------------|-------------------------|
| <b>Paper-A</b><br>Advanced<br>Dietetics<br>& Clinical<br>Nutrition                            | 3<br>Hours                 | 75            | 3<br>Hours                    | 25                    | -                     | 100                     |
| <b>Paper-B</b><br>Food Service<br>Equipment and Hours<br>Layout and<br>Community<br>Nutrition | 3                          | 75            | -                             | -                     | 25                    | 100                     |
|   |                            |               |                               |                       | <b>Total Marks:</b>   | <b>200</b>              |



**Clinical Nutrition and Dietetics**  
**(Vocational)**  
**Paper-A (Theory)**  
**Advanced Dietetics and Clinical Nutrition**

**Time: 3 Hours****Marks: 75****Instructions for the Paper Setters:**

As per the scheme of the examination for clinical nutrition and dietetics (Vocational), Papers A and B are of 75 marks each.

**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. Each question will carry five marks. Ten questions will be set by the examiner and 7 will be attempted by the candidates. The total weightage of the section being **35 marks**.

**Section-C:** It 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 are required to attempt two questions. Each question will carry 10 marks, total weightage of the section being **20 marks**.

1. Nutrient and drug interaction–Effect of drug therapy on intake, absorption and utilisation of nutrients.
2. Diets in Fever and Infections–Types, metabolism in fevers, general dietary considerations. Diet in :-
  - (a) Influenza
  - (b) Typhoid
  - (c) Recurrent Malaria
  - (d) Tuberculosis
3. Diets during disorders of G.I.T.
  - (a) Peptic ulcers
  - (b) Diarrhoea & Constipation Etiology, Symptoms and treatment and dietary modifications.
4. Diet in disturbances of small intestines and colon–Effect on digestion, absorption and nutritional status and dietary treatment in:-
  - (a) Flatulence
  - (d) Ulcerative colitis–symptoms and dietary treatment
  - (c) Sprue-coeliac diseases
  - (d) Lactose intolerance–dietary treatment
5. Diet in diseases of liver, Gall Bladder pancreas–Etiology, symptoms, metabolics nutritional implication and dietary treatment in:-
  - (a) Jaundice
  - (b) Hepatitis
  - (c) Cirrhosis of liver and hepatic coma
  - (d) Dietary treatment in cholecystites and chololithesis, and pancreatitis.
6. Diet in diabetes Mellotis–In born efforts of metabolism, incidence and predisasting factors symptoms and types, Metabolism in diabetes, dietary treatment and meal management. Hypoglycemio agents insulin and its type. Complication of diabetes.
7. Die in Renal diseases–
 

Basic renal functions, Symptoms and dietary treatment in:-

  - (a) Acute and chronic glomeriulonephritis and nephrosis.
  - (b) Urinary calculi-causes, treatment, acid and alkali producing and neutral foods and dietary treatment.
8. Diets and cardiovascular diseases–Etiology and symptoms and role of nutrition in :
  - (a) Artherosclerosis
  - (b) Hypertension
  - (c) Hyperlipidemia

Dietary treatment and management of the above.
9. Gout–Nature and occurance of uric acid, causes, symptoms and dietary management.
10. Obesity

**References:**

1. Nutritive Value of Indian Foods, Gopalan, et.al., National Institute, 1984.
2. Nutririon in Health & Disease, Aderson Linnea, Toronto Lippincot, 1982.
3. Clinical Dietetics & Nutrition, Anita, FP. Delhi Oxford, University Press, 1998.
4. Nutrition and Diet Theraphy, Lutz, Carrolla, Philadelphia Fa Davis Co., 2001.
5. Kraiss Food Nutrition & Diet Therapy, Mohan, L.K. and Escotts, Philadelphia WB Saun DERS, 2000.

**Paper-A**  
**Advance Dietetics and Clinical Nutrition**  
**(Practical)**

**Time: 3 Hours**

**Marks: 25**

1. Planning and preparation of diets with modified:-
  - (a) Elbre and Residue
  - (b) Diet in diarrhoea and constipation
  - (c) Diet for Ulcers
  - (d) Diet for liver diseases hepatitis & Ciorrhosis of liver.
2. Planning and preparation for diets in fevers and infection (as in theory).
3. Planning and preparation for diet in diabetes mellitus. Planning snaks, deserts and beverages for diabetes.
4. Planning and preparation for diet in Cardiac-Vascular diseases, congestive cardiac failure, hypertension and atheroscletosis.

**Clinical Nutrition and Dietetics**  
**(Vocational)**  
**Paper-B (Theory)**  
**Food Service Equipment and Layout and Community**  
**Nutrition**

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

As per the scheme of the examination for clinical Nutrition and dietetics (vocational), Paper A and Paper B are of 75 marks each.

**Instructions for Paper Setters/Examiners:**

**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 very short answer questions with answer to each question upto two pages in length. Each question will carry five marks. Ten questions will be set by the examiner and 7 will be attempted by the candidates. The total weightage of the section being **35 marks**.

**Section-C:** It 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 are required to attempt two questions. Each question will carry 10 marks, total weightage of the section being **20 marks**.

1. (a) Nutrition and Health in National Development.  
 (b) Nutritional Problems confronting our country. The causes of Malnutrition in India–Balance between food to population growth.
2. Method of Assessment of Nutritional Status.
  - (a) Sampling techniques.
  - (b) Identification of risk group.
  - (c) Direct assessment–Diet surveys anthropometry, Clinical and Biochemical estimations.
  - (d) Indirect assessment–Food balance sheets and agricultural data, Ecological parameters and vital statistics.
  - (e) Use of growth charts.
3. Nutrition intervention schemes in the community, lecture and method demonstration, nutrition exhibitions and visual aids.
4. National and international agencies in community nutrition ICDS, SNP, ANP, Mid-day meal programme, FAO, WHO, UNISEF, CARE, AID, ICMR, ICAR, CSIR, NIN, CFTRI.
5. Breast-feeding and its implications. Hazards of bottle feeding.
6. Weaning foods–Planning, formulating and preparing importance of correct and timely weaning.
7. Immunization and its importance.
8. Recent advances in community nutrition research–Fortification, enrichment of food.

**References:**

1. Essential Preventive Medicine A Clinical and Applied Orientatia, Ghai, O.P. Gupta Pijush, New India Vikas Publisher, 1999.
2. Hygiene and Public health, Ghosh B.N., Atma Ram & Sons, 1969.
3. Introduction to Home Science, Arvinda chandra, Metropolitan Publisher, New Delhi, 1978.
4. Nutrition for Developing Combries, King Publisher, Oxford University, 1978.
5. Mat Nutrition in Cludian Bans, Harmesh Singh, Tata McGraw Hill Publisher, 2000.
6. Nut A Health Promotion Approach, Webb, Geoterry, London Arna Publisher, 2002.

**Food Service Equipment and Layout and  
Community Nutrition  
Paper-B  
(Only Internal Assessment)  
(Practical)**

**Marks: 25**

1. Study the food service equipment available in India–Survey to be conducted by the students and they will submit the project.
  2. Planning physical layouts of a food service institutions, commercial, non-commercial school feeding, ICDS etc., charts transparencies of physical layout of the above to be made.
  3. Diet and nutrition surveys:
    - (a) Identifying vulnerable and at risk groups.
    - (b) Diet surveys and breast feeding and weaning practices of specific groups.
    - (c) Use of anthropometric measures in community–Project report of the above to be submitted by the students.
  4. Methods of extension used in community to impart nutrition education to them–
    - (a) Preparation of visual aids–Charts, posters, models etc. for exhibition.
    - (b) Lecture and method demonstration to target groups.
- Note:** Each student will arrange for atleast two demonstration imparting nutrition education to community by using different AV aids.
5. Field visits to:
    - (a) Observe the working of nutritional and health oriented programmes.
    - (b) Hospitals to observe nutritional deficiencies and give nutrition advice.

### Fashion Designing and Garment Construction (Vocational)

| Sr. No. | Paper Name                                    | Time   | Marks: 200                                 |
|---------|---|--------|--|
| I.      | History Costumes of India & World             | 3 Hrs. | 50 Marks                                   |
| II.     | Advance Dress Designing & Construction        | 4 Hrs. | Practical: 60 Marks<br>Int. Ass.: 15 Marks |
| III.    | Pattern Making & Draping                      | 4 Hrs. | Practical: 40 Marks<br>Int Ass.: 10 Marks  |
| *IV.    | *Portfolio Making/<br>Exhibition/Fashion Show |        | 25 Marks                                   |

\* The students are required to take up a project and prepare a portfolio on a particular theme or age group, later present an exhibition or fashion show. This will be pre-requisite for B.A. degree.

| Sr. No. | Paper Name                             | Lectures/Week | Examination |           |
|---------|--|---------------|-------------|-----------|
|         |  |               | Th.         | Practical |
| I.      | Historic Costumes of India & World     | 4             | 3 Hrs.      | –         |
| II.     | Advance Dress Designing & Construction | 2x3=6         | –           | 4 hrs.    |
| III.    | Pattern Making and Draping             | 2x2=4         | –           | 3 hrs.    |

**Fashion Designing and Garment Construction**  
**Paper-I**  
**History Costumes of India & World**  
**(Theory)**

**Time: 3 Hrs.**

**Marks: 50**

**1. Historic Costumes of India and World:**

- a) Egypt
- b) Greece
- c) Rome
- d) Asiatic

**2. Traditional Costumes of the following States of India:**

- a) Punjab
- b) Himachal Pradesh
- c) Jammu & Kashmir
- d) Maharashtra
- e) Rajasthan
- f) Gujarat
- g) Manipur
- h) Bengal
- i) Kerela
- j) Karnataka

**3. Traditional Textiles of India:**

- a) Jamdhani & Baluchari of Bengal
- b) Tanchoi & Patola of Gujarat
- c) Irkal & Paithani of Maharashtra
- d) Chanderi & Maheshwari of MP
- e) Pochampali of Andhra Pradesh
- f) Sanganeri prints of Rajasthan
- g) Kanchipuram sarees of Tamil Nadu

**General Instructions to the Paper Setter:**

The question paper consists of eight questions, out of which student will attempt five. All questions carry equal marks.

**Fashion Designing and Garment Construction**  
**Paper-II**  
**Advance Dress Designing and Construction**  
**(Practical)**

**Time: 4 Hrs.**

**Total Marks: 75**

**Practical: 60**

**Int. Ass.: 15**

**Advance Dress Designing and Construction**

- 1) Drafting of the Basic Trouser block

**Draft Construct the following:**

- 1) Jacket/Coat
- 2) Trouser/Culottes/Hipsters
- 3) Evening Gown/Formal Indian Dress
- 4) Nightwear

**General Instructions to the Paper Setter for Practical-II:**

**Practical: 60 Marks**

**Int. Ass.: 15 Marks**

- |   |          |
|---|----------|
| 1. Design any one garment from syllabus on 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****Pattern Making and Draping****Time: 4 Hrs.****Total Marks: 50****Practical: 40****Int. Ass.: 10**

1. Draping of Basic Bodice Block Front
2. Draping of Basic Bodice Block Back
3. Draping of Sleeve Block
4. Draping of Stylised Neckline and Armholes.



## Defence and Strategic Studies SCHEME

**Theory: Two Papers of 80 Marks each.**

**Time: 3 Hrs.**

**Total: 200 Marks**

**Theory (Paper A): 160 Marks**

**Practicals\* (Paper A & B): 40 Marks**

### Paper-A

### NATIONAL SECURITY OF INDIA (THEORY)

**Time: 3 Hrs.**

**Total: 100 Marks**

**Theory: 80 Marks**

**Practical: 20 Marks**

**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, 2 from each unit. The candidates shall attempt any 4 questions, one from each unit. Each question shall carry 13 marks. The total weightage of this section shall be **52 marks**.

**Note: Practical\* is 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

**i) National Security: Conceptual Aspects.**

**ii) Elements of National Security:**

- a) Geography
- b) Mineral resources
- c) Social, Political and Economic factors
- d) Scientific and Technological Development
- e) Military preparedness

**iii) India's Security Problems since Independence**

- a) Geo-political effects of partition
- b) Security problems related to Pakistan
- c) Security problems related to China

#### Unit-II

**i) Indian Ocean and India's Security:**

- a) Geo-strategic importance of the Indian Ocean
- b) India's economic, Political and Security stakes in the Indian Ocean
- c) Role of Indian Navy & Coast Guards

**ii) Nuclear Policy of India**

#### Unit-III

**i) Internal Dimension of India's Security:**

- a) Militancy in Jammu & Kashmir
- b) Insurgency in North eastern states

**ii) Civil Defence Organisation in India: Structure, objectives, role and problems.**

**Unit-IV**

- i) Economic Mobilisation for national defence with reference to mobilization of Physical and Fiscal resources.  
 ii) Planning and Production for national defence.  
 (iii) Major defence production Industries in India.

**Suggested Readings:**

- |   |  |
|---|--|
| Buzan, Barry (1987)                           | People Fear and State : New Delhi, Transasia Publications.   |
| Bajpai, U.S. (1986)                           | India and its Neighbourhood: New Delhi, Lancer International.  |
| Baranwal, S.P.(1984)                          | Measures of Civil Defence in India: New Delhi, Guide Publications.                                       |
| Bobbing, Ross and Gordon, Sandy (eds.)        | India's Strategic Future: Delhi, Oxford University Press. (1992)   |
| Chatterjee, R.K. (1978)                       | India's Land Borders—Problems and Challenges: New Delhi, Sterling Publishers.                            |
| Chadhury, Rahul Roy (1995)                    | Sea Power and India's Security, London, Brassey's.   |
| Dass S.T. (1987)                              | National Security in Perspective: Delhi, Gian Publishers.  |
| Karnard, Bharat (1994)                        | Future Imperiled: New Delhi, Viking.   |
| Kavic, Lorne J. (1967)                        | India's Quest For Security: Defence Policies 1947-1965: Los Angels, University of California Press.      |
| Khera, S.S. (1968)                            | India's Defence Problems: New Delhi.   |
| Menon, V.P. (1961)                            | The Story of the Integration of Indian States: New Delhi, Orient Longmans.                               |
| Misra, R.N. (1986)                            | Indian Ocean and India's Security: Delhi, Mittal Publications.   |
| Nayar, V.K. (1992)                            | Threats From Within: New Delhi, Lancer Publications.   |
| Rao, Ramakrishna and Sharma, R.C. (ed) (1991) | India's Borders: New Delhi, Scholars' Publishing Forum   |
| Rao, P.V.R. (1970)                            | Defence Without Drift: Bombay, Popular Prakashan.  |
| Singh, Jaswant (1999)                         | Defending India: Banglore, Macmillan India Ltd.  |
| Singh Nagendra (1974)                         | The Defence Mechanism and the Modern State: New Delhi, Asia Publishing House.                            |
| Venkateshwaran (1967)                         | Defence Organisation in India: New Delhi, Ministry of Information and Broadcasting, Government of India. |

**Defence and Strategic Studies**  
**Paper-B**  
**REGIONAL SECURITY AND CO-OPERATION**

**Time: 3 Hrs.**

**Total: 100 Marks**  
**Theory: 80 Marks**  
**Practical: 20 Marks**

**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, 2 from each unit. The candidates shall attempt any 4 questions, one from each unit. Each question shall carry 13 marks. The total weightage of this section shall be **52 marks**.

**Note: Practical\* is 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**

- i) Theoretical dimensions of 'Region' in International Relations.
- ii) Regional Security: Regional Cooperation and Military Alliances: Conceptual Dimensions.

**UNIT-II**

- i) North Atlantic Treaty Organisation-(NATO): Aim, Organisation and Working.
- ii) Gulf Cooperation Council-( G.C.C.): Aim, Organisation and Working

**UNIT-III**

- i) Association of South-East Asian Nations-(ASEAN): Concept, Objectives, Features, Problems & Achievements.
- ii) Shanghai Cooperation Organisation-(S C O) : Aim, Organisation and Working.

**UNIT-IV**

- i) Non-aligned Movement (NAM) :-History, Features, Problems, Achievements and relevance in Contemporary period; India and Non-aligned Movement.
- ii) South Asian Association for Regional Cooperation- (SAARC):
  - a) Concept, Objectives, Features.
  - b) Problems & Achievements.

**Suggested Readings:**

Buzan, Barry, (1987)

People Fear and State : New Delhi,  
Transasia Publications.  
Regions and Powers: Cambridge.

Buzan, Barry and  
Waever, Ole (eds.) (2003)  
Das, S.T. (1987)

National Security in Perspective: Delhi,  
Gian Publishing House.

Frankal, Joseph (1970)  
Garnett, John (ed) (1970)

National Interest: London, Macmillian.  
Theories of Peace and Security:  
Macmillan St. Martin's Press.

Kinger, Kamal (2008)  
Morgenthau, Hans J. (1969)

Rashtri Surakhea (in Punjabi)  
Politics Among Nations: Calcutta,  
Scientific Book Agency.

Palmer Perkins,  
Norman D. and  
Howard C. (1968)  
Chaudhury, Subrata Roy (1966)

International Relations: Calcutta,  
Scientific Book Agency

Singh, Nagendra (1974)

Military Alliances and Neutrality in War  
and Peace: New Delhi, Orient Longman.  
The Defence Mechanism and the  
Modern State: New Delhi, Asia  
Publishing House. SIPRI Year Book.

**Defence and Strategic Studies****Paper: Practical****Time: 3 Hours****Marks: 40****Teaching Hours: 3 Periods a Week****Group-A: 20 Marks****Written: 1½ Hours**

**Note:** The paper for written test is to be given by the external examiner on the spot. Internal examiner has to assist him in the conduct of the examination.

1. Relief features and their representation on the Map.
2. Types of slopes and their representation on the Map.
3. Study of field craft with reference to the following:
 

|                 |                  |                |
|-----------------|------------------|----------------|
| (a) Ground      | (b) Cover        | (c) Camouflage |
| (d) Concealment | (e) Observation. |                |
4. Tactical, Formations–Section and Platoon
5. Verbal orders
6. Military message writing
7. Patrol - Types and stages of patrolling

**Group - B : Group Discussion (Topics)**

- (a) India's Nuclear Policy.
- (b) Naval Defence of India.
- (c) Sino-India Relations
- (d) Confidence bulding measures between India and Pakistan.
- (e) Major Threats to Environment

**10 Marks****Group-C****Viva-Voce****05 Marks****Group-D Record****05 Marks**

**HISTORY****Paper-A****History of the World (C 1500-1956 AD)****Time: 3 Hours****Max. Marks: 100****Note: The question paper will 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 at least 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 at least 50 percent of the theme.

1. **Emergence of the Modern World:** Renaissance and reformation; Causes, effects of Renaissance in Europe; Martin Luther's Protestantism;
2. **French Revolution:** Causes; National Assembly; National Convention; Reign of Terror.
3. **Nepolenic Era:** Nepoleon's rise to Power, Civil Works and Codes, Continental System, Downfall of Nepoleon, Vienna Settlement, Maternich System.
4. **Rise of Nationalism in Europe:** Impact of Industrial Revolution, Unification of Italy and role of Cavour, Mazini and Garibaldi, Unification of Germany; Bismark, William Kaiser.
5. **The World War-I:** Causes, Course of the war, Treaty of Versailles; League of Nations.
6. **Russian Revolution :** Causes, February Revolution, October Revolution; New Economic Policy.
7. **Rise of China and Japan :** The revolution of 1911; Sunyet Sen; Rise of Communism in China; the Revolution of 1949; Opening up of Japan; Meiji restoration and the Modernization of Japan; Russo-Japanese War; Impact of 2nd World War on Japan.
8. **Rise of Nationalism in West Asia :** Struggle for Freedom and Reforms in Egypt; Emergence of Arab Nationalism after World War-I; Creation of Israel; Suez Crisis; Modernization of Turkey under Kamal Pasha; Establishment of Republic in Turkey.
9. **Rise of USA as World Power :** Entry in the First World War; 14 points of President Wilson; New Deal of Roosevelt; 2nd World War and the USA.
10. **Causes & Results of 2nd World War :** Fascism in Italy; Mussolini; Nazism in Germany; Hitler, Internal and External Policy of Hitler; Outbreak of War and Victory of the Allies, the UNO; the Cold War: NATO and the Warsaw Pact.

**History**  
**Paper-B**  
**History of the Punjab (1799-1966)**

**Time: 3 Hours****Marks: 100****Note: The question paper will 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 at least 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 at least 50 percent of the theme.

1. **The Establishment and Expansion of Ranjit Singh's Kingdom :** Political condition of the Punjab in the 1790s; Conquests of the Sikh principalities; Subjugation of the Satlej- Jamuna Divide and British intervention; Subjugation of the hill principalities; annexation of Afghan dependencies; Policy towards the defeated rulers; Extent of the kingdom in 1839.
2. **Administrative Organization of the Kingdom of Lahore:** Central, Provincial and local administration; Land revenue system. Jagirdari system, Dharmarth grants; Judicial administration; Military organization; state policy towards agriculture, Manufacture and trade.
3. **Towards Annexation :** Nature of Ranjit Singh's relations with the British; his weak successors and factional politics; First Anglo-Sikh War; Treaties of Lahore and Bhyrowal (1846); Second Anglo-Sikh War; Annexation.
4. **British Policies:** New administration 1845-1856; spread of education; Transport and Communication; Agricultural development; Irrigation projects and colonization; Alienation of Land Act (1900).
5. **Socio-Religious Reform Movements in the late– Nineteenth Century :** Christian evangelicals, Western ideas; the Arya Samaj; Foundation and spread, Social, religious and educational programme; The Nirankaris and the Namdharis; the Singh Sabhas; foundation and spread; social, religious and educational programme; the social and religious programme of the Ahmadiyas.
6. **Towards Political Awakening:** The new Middle class; participation in the District Boards, Municipal Committees and Legislative Council; Journalistic activity; Lahore Indian Association; Association with the Indian National Congress; Swadeshi and Boycott.
7. **Struggle Against the Raj:** The Ghadar movement; Rowlatt Satyagrahs and the Jallianwala Bagh; Non-Cooperation Movement; Hindustan Socialist Republican Army and Naujawan Bharat Sabha; Civil Disobedience and Quit India Movement.
8. **Gurdwara Reforms and the Akalis :** Causes of the movement for reform; Central Sikh League; SGPC and the Shiromani Akali Dal ; Major Morchas ; Gurdwara legislation; Leadership ; Association with the Congress.
9. **Towards Partition:** Communal politics; Constitutional development since 1909; Sikander–Jinnah Pact; Lahore Resolution of the Muslims League; The elections of 1945-46; Congress Akali Unionist Coalition; Cabinet Mission Plan Mountbatten Plan and Partition.
10. **The Punjab after Independence:** Reorganisation and rehabilitation: Demand for Punjabi speaking state; The reorganisation Act of 1966.

**Political Science**  
**Paper – A**  
**Comparative Political Systems (UK & USA)**

**Time: 3 Hours**

**Marks: 100**  
**20x4: 80 Marks**  
**10x2: 20 Marks**

**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 entire syllabus i.e. Sections A, B, C & D and will carry 20 marks in all, such short answer type questions carry 2 marks.

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

**Section – A****Theoretical Framework**

1. Meaning and Scope of Comparative Government and Politics.
2. Comparative Method.
3. **Systems Approach:** David Easton and Almond and Powell.

**Section – B**

1. Features of British Political System.
2. Features of US Political System.
3. **Executive in US:** President, Powers, Position and Role,  
**Executive in UK:** Monarchy, PM, Powers, Positions and Role.

**Section – C**

1. Legislatures in US & UK.
2. Political Parties and Pressure Groups in US and UK.

**Section – D**

1. **Judicial System in USA and UK:** Judicial Review in USA and Rule of Law in UK.
2. Unitary v/s Federal System, USA and UK.

**Books Recommended :**

1. Rod Hague and Martin Harrop, *Comparative Government and Politics*, New Delhi, Palgrave Macmillan, 2007.
2. G.A. Almond, G.B. Powell, K. Strom, R.J. Dalton, *Comparative Politics Today: A World View*, New Delhi, Pearsons, 2006.
3. J.C. Johari, *New Comparative Government*, New Delhi, Lotus Press, 2006, 4263/3, Ansari Road, Daryaganj, New Delhi-110002.
4. A.C Kapur and K.K. Misra, *Selection Constitutions*, New Delhi, S. Chand, 2006 (Sixteenth Revised Edition).
5. A.C. Kapur and K.K. Misra, *Selection Constitutions*, New Delhi, S. Chand, 2006 (Sixteenth Revised Edition).
6. S.N. Ray, *Modern Comparative Politics: Approaches, Methods and Issues*, New Delhi, PHI, 1999.
7. M.V. Pylee, *Select Constitutions of the World*, New Delhi, Universal Law Publishers, 2006 (Revised)



**Political Science****Paper – B****International Politics: Theory and Practice****Time: 3 Hours****Marks: 100****20x4: 80 Marks****10x2: 20 Marks****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 entire syllabus i.e. sections A, B, C & D and will carry 20 marks in all, such short answer type questions carry 2 marks. Candidates are required to attempt one question, from each 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. Meaning, Nature and Scope of International Politics.
2. Realist and Idealist Approaches to International Politics.

**Section–B**

1. **National Power:** Its Elements
2. System of Balance of Power and Collective Security

**Section–C**

1. Cold War and Post Cold War era of International Politics.
2. Bipolar, Unipolar and Nature of Emerging World Order.
3. Issues of Terrorism

**Section–D**

1. **Regional Organisations:** SAARC and EU.
2. **UNO:** Principles, aims, objectives and its work.
3. New International Economic Order (NIEO).

**Recommended Books:**

1. Joshua S. Goldstein, *International Relations*, New Delhi, Pearson Education, 2006.
2. John Baylis and Steve Smith, *Globalization of World Politics*, New Delhi, Oxford University Press, 2005.
3. V.K. Malhotra, *International Relations*, New Delhi, Anmol Publishers Private Ltd., 2004.
4. R.P. Barston, *Modern Diplomacy*, New Delhi, Pearsons, 2006.
5. John Allphin Moore, Jr. and Jerry Pubantz, *The New United Nations, International Organization in the Twenty First Century*, New Delhi, Pearsons, 2008.



**Public Administration**  
**Paper-A**  
**Local Government (with special reference to Punjab)**

**Time: 3 Hours****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**.

**Introduction:**

Meaning and Significance of Local Government. History of Local Government in India. Main Features of 73rd and 74<sup>th</sup> Constitutional Amendments, State-Local Government Relations; Role of State Finance Commission.

**Urban Local Government:**

Main features of Urban Local Government in Punjab, Types of Urban Local Bodies, Municipal Corporation, Organisation and Functions, Municipal Commissioner, Mayor, Provincialisation of Municipal Services.

Municipal Council: Organisation and Functions; President, Executive Officer.

**Rural Local Government:**

Main features of Panchayati Raj System in Punjab; Gram Sabha. Village Panchayats-Structure, Finance and Functions. Recommendations of Punjab Finance Commission. Panchayat Samitis-Structure, Finance and Functions. Zila Parishads-Structure, Finance and functions.

**State Control:**

Organisation of Department of Local Government in Punjab. Relation of Local Government Institutions with District Administration. State control over Panchayati Raj Institutions and Urban Local Government.

**Suggested Readings:**

1. Dubey V.P., Urban Development and Administration, Deep & Deep Publication Pvt. Ltd., 1990.
2. Goel S.L., Urban Administration in India, New Delhi, Deep & Deep Publication Pvt. Ltd., 2003.
3. Hoshiar Singh, Theory and Practice of Local Government, Allahabad, Kitab Mahal, 1999.
4. Maheshwari S.R. , Local Government in India, Agra, Lakshmi Narain Aggarwal, 2005.
5. Sachdeva Pardeep , Urban Local Government in India, Allahabad, Kitab Mahal, 2002.
6. Sahib Singh and Swinder Singh, Local Government in India, Jalandhar, New Academic Publishing Co., 2005.
7. Sachdeva D.R., Sathanak Sarkar : Punjab De Sandarbh Vich, Publications Bureau, Patiala, 2003.

**Public Administration**  
**Paper-B**  
**Development Administration**  
**(With Special Reference to Punjab)**

**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.

**Introduction:**

Development Administration–Meaning, Scope and Significance. Main features of Development Administration in India. Features of Developed and Developing Countries. Mixed Economy Model & its Rationale and Significance.

**Planning Machinery:**

Planning Commission and National Development Council. State Planning Commission. District and Block Level Planning Machinery. Formulation and Implementation of Development Programmes and Projects.

**Public Sector and Development:**

Evolution and Expansion of Public Sector. Role of Public Sector. Management Boards. Forms and Features of Public Enterprises. Administrative Problems of Public Sector. Parliamentary and Executive control over Public Sector. New Economic Policy. Public sector Reforms and Privatization.

**Social Welfare and Development:**

Welfare of Scheduled Castes, Scheduled Tribes and other Backward Classes. Welfare Measures for Women and Children, Central Social Welfare Board; Composition and functions. Role of Voluntary Agencies. Population Control-Programmes and Implementations.

**Suggested Readings:**

1. Khera S.S. , Government in Business, National Publishing House, New Delhi, 1977.
2. Kapoor S.S., Women and Welfare: A Study of Voluntary Agencies, Indus Publishing Company, New Delhi, 1995.
3. Puri K.K. and G.S. Brar, Development Administration, Bharat Parkashan, Jalandhar, 1993.
4. Sachdeva D.R., Social Welfare Administration in India, Kitab Mahal, Allahabad 2005.
5. Sapru R.K., Development Administration, Deep & Deep Publications, New Delhi, 1986.

**Sociology**  
**Paper-A**  
**Social Thought**

**Time: 3 Hours**

**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 answer to each question upto 3 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) Auguste Comte: Law of three stages, Positivism
- b) Herbert Spencer: Social Darwinism and types of Society.
- c) Karl Marx: Dialectical Materialism, Historical Materialism and class struggle.

**Unit-II**

- a) Max Weber: Theory of Social action, types of Authority, Protestant Ethic and Spirit of Capitalism.
- b) Emile Durkheim: Nature and Characteristics of Social facts and Division of Labour in Society and Theory of Suicide.
- c) Concepts and Feature of Functionalism Conflict, Theory and Social Action.

**Sociology**  
**Paper-B**  
**Social Research and Scientific Methods**

**Time: 3 Hours****Marks: 100****Note: Questions 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 answer to each question upto 3 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) Social Research: Meaning and Functions.
- b) Scientific Methods: Nature, Steps and Types-quantitative and Qualitative.
- c) Design of Social Research: Meaning and Types : Descriptive, Exploratory, Experimental.

**Unit-II**

- a) Sampling and its types.
- b) Methods and Techniques of Data Collection: Observation, Questionnaire, Interview Schedule and Case Study.
- c) Report writing.

**Books Recommended for Paper A & B**

1. Ayon, Raymond: *Main Currents in Sociological Thought*, Vols. I, II, Penguin, Harmondsworth, 1968.
2. Abraham, M. Francis: *Contemporary Sociology*, Oxford University, New Delhi, 2006.
3. Ashley, David, Orenstein, D.M.: *Sociological theory*, Dorling Kindersly, Delhi, 2007.
4. Bajpai, S.R.: *Methods of Social Survey & Research*, Kitab Ghar, Kanpur, 1976.
5. Coser, Lewis A: *Master of Sociological Thought*, Harcourt Brace Jovanovich, New York, 1971.
6. Goode, and Hatt: *Methods in Social Research*, McGraw Hill, Tokyo, 1952.
7. Ghosh, B.N.: *Scientific Method & Social Research*, Sterling Publications, New Delhi, 1985.
8. Jammu I.S.: *Samajak Vigyan Pattar*, No.-26-28, Punjabi University, Patiala, 1998.
9. Jaspal Singh: *Introduction to Methods of Social Research*, Sterling, New Delhi, 1990.
10. Jayaram, N.: *Research Methodology: Methods and Techniques*, MacMillian, Madras, 1989.
11. Kalton, Graham: *Introduction to Survey Sampling*, Sage, New Delhi, 1983.
12. Kapila, S.: *Methods of Social Research*, New Academic Publishing Co., Mai Hiran Gate, Jalandhar, 1991.
13. Kapila, S.: *Fundamentals of Sociology*, Vol. III, Panchkula, Kapila Publishers, 2006.
14. Paramjit Singh: *Samaj Vigyanik Drishtikon te Sidhant*, Panjabi University, Patiala, 1997.

**Psychology**  
**Paper-A**  
**Abnormal Psychology**

**Time: 3 Hours****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 type question with answers to each question up to 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 candidates will be required to attempt two. Each question will carry **24 marks**.

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

**Abnormality:** Concept and Criteria of Abnormality. Myth and Misconceptions regarding Abnormal Behaviour. DSM IV classification of Abnormal Behaviour- Advantages and disadvantages.

**Theoretical Perspectives of Psychopathology:** Psychoanalytic, Cognitive Behavioural, Humanistic and Interpersonal (Sullivan).

**Causes of Abnormal Behaviour:** Primary, Predisposing, Precipitating reinforcing.

Biological Causes–(Genetic defects, constitutional liabilities, Brain dysfunction & Physical deprivation).  
Psycho-Social Causes–(Self-perception and cognitive maps, early deprivation, Inadequate parenting, pathogenic family structures, maladaptive peer relationship).

Socio-Cultural Causes–(Socio-Cultural Environment and Pathogenic societal influences).

**Stress & Coping:** Categories of Stressors, Factors Predisposing an individual to stress. Coping strategies.

**Stress Related Disorders:** Coronary Heart Disease (CHD), Hypertension Ulcers & Migraine Pain : Causes, Symptoms Causes and Treatments.

**Alcoholism:** Misconception about Alcohol & Alcoholism, Clinical Picture, Causes. Treatment & Outcomes.

**Drug Addiction:** Clinical Picture, Causes and Treatment of Opium and its Derivatives, Sedatives (Barbiturates) Stimulants (Amphetamines & Cocaine): Hallucinogens (LSD & related drugs) Marijuana, Caffeine & Nicotine.

**Readings:**

1. Carson, R.C., Butcher, J.N. and Mineka, S. (1997), *Abnormal Psychology and Modern Life*, New York: Harper Collins.
2. Davison, G.C. and Neale, J.M. (1998), *Abnormal Psychology*, New York: John Wiley and Sons.
3. Sarason, I.G. and Sarason, B.R. (1996), *Abnormal Psychology*, New Delhi: Prentice Hall of India.
4. Singh, A. Asadharan Manovigyan, Punjabi University, Patiala.
5. Alloy, L.B., Riskind, J.H. & Manso, M.J. (2006), *Abnormal Psychology* Tata McGraw Hill Publishing Company, New Delhi.

**Psychology**  
**Paper-B**  
**Abnormal Psychology**

**Time: 3 Hours****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 type question with answers to each question up to 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 candidates will be required to attempt two. Each question will carry 12 marks; total weightage of section being **24 marks**.

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

**Anxiety Based Disorders:** Symptoms, Etiology and Treatment of Obsessive Compulsive Disorder, Generalized Anxiety Disorder & Phobias. Classification of Somatoform Disorders–Symptoms & Etiology (Conversion Disorder). Dissociative disorders–Types, Symptoms & Etiology.

**Personality Disorders:** Clinical Features, Types and causal factors in Personality Disorders (Paranoid, Schizoid, Schizotypal, Histrionic, Narcissistic, Antisocial, Boderline, Avoidant, Dependent, Obsessive-Compulsive, Passive Agressive, Self-Defeating & Sadistic.

**Antisocial Personality & Delinquency:** Clinical Picture, Characteristics, Causes, Treatment & Outcomes.

**Mood Disorders:** Types & Symptoms, Causes and treatment.

**Schizophrenia:** Symptoms, Causes Types and Treatment.

**Therapies:** Psychodynamic, Behavioural, Cognitive-Behaviour Therapy (Rational Emotive) & Humanistic therapy.

**Statistics:** Introduction to the concept of Hypothesis, One-tailed and two-tailed tests, Type I and Type II errors, Level of significance, degrees of freedom, Significance of Differences between means (Large sample, correlated and uncorrelated).

**Readings:**

1. Broota, K.D., Experimental Designs in Behavioural Research, Wiley Eastern Limited, New Delhi, 1989.
2. Carson, R.C. Butcher, J.N., and Mineka, S.(1997), Abnormal Psychology and Modern Life, Harper Collins, New York.
3. Davison, G.C. and Neale, J.M. (1998), Abnormal Psychology, John Wiley and Sons, New York.
4. Garrett. H.E. (1996), Statistics in Psychology and Education, Vakils, Feffar and Simons, New Delhi.
5. Sarason, I.G. and Sarason, B.R.(2002), Abnormal Psychology, Prentice Hall of India, New Delhi.
6. Singh, A., Asadharan Manovigyan, Punjabi University, Patiala.
7. Barlow, D.H. & Durand, V.M., Abnormal Psychology : An Integrative Approach. Thomson Wordsworth, 2007.

**Psychology  
Practicals****Time: 3 Hours****Marks: 50****Note: Any *Ten* Practical out of *Twelve* are to be conducted.**

OR

1. Six Practicals and one Small Project work may be conducted.
2. The Project work will be of 20 marks and shall be evaluated by the external examiner at the time of the practical examination.

1. Projective Techniques (T.A.T.).
2. Measurement of Anxiety.
3. Word Association Test.
4. Adjustment Inventory.
5. Raven's Progressive Matrices/Cattell's Culture Fair Intelligence Test.
6. Parenting Scale/Home Environment Scale.
7. Measurement of Attitudes.
8. Measurement of Interests.
9. EPQ.
10. Measurement of Depression.
11. Locus of Control.
12. Rosenweig's Pictures Frustration Test.



**Geography**  
**Paper-A**  
**World Regional Geography**

**Time: 3 Hours****Marks: 70****Objectives:**

To provide an understanding of:

The geographic dimensions of the world regions in terms of their political and administrative characteristics.

The physical and human resource base and their interface with economic development.

Development problems and prospects.

**Notes: Instructions for the Paper Setters and Candidates**

1. Question will be put on region(s) as a whole and not on individual country. The question should focus on regional perspective.
2. 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).
3. 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 four questions selecting one from each unit. This will be in addition to the compulsory question at note number 2.

**Course Contents:**

Study of the following regions of the world in terms of constituent countries, strategic location, salient physical, demographic and economic features, cultural patterns, resource base, economic development, problems and prospects.

**Unit-I**

- (i) Anglo-America (ii) Latin America

**Unit-II**

- (i) Europe (ii) Australia (ii) Russia and Commonwealth of Independent States (CIS)

**Unit-III**

- (i) East Asia (ii) South East Asia (iii) South Asia

**Unit-IV**

- (i) Middle East and North Africa (ii) Africa South of Sahara

**Books Recommended:****Essential Readings:**

1. Blij, Harm J.de Peter, O. Muller : *Geography : Regions and Concepts*, John Wiley, New York, 1993.
2. English, Paul Ward & James, A. Miller: *World Regional Geography : A Question of Place*, John Wiley, New York, 1989.
3. Jackson, Richard H. & Lloyd E. Hudman: *World Regional Geography Issues for Today*, John Wiley, New York, 1991.
4. Kromm, D.E. : *World Regional Geography*, Saunders Publishing, New York, 1980.

**Further Readings:**

1. Don R. Hoy (Ed.) : *Essentials of Geography and Development*, Macmillan, New York, 1980.
2. Mankoo, Darshan Singh: *A Regional Geography of the World*, Kalyani Publishers, Ludhiana.
3. Singh, Malkiat : *World Regional Geography*, Rasmeeth Prakashan, Jalandhar, (Pb.)
4. Trikha, R.N. and Bali P.K. and Sekhon, M.S.: *World Regional Geography*, New Academic Publishers, 2002.

**Pedagogy**

Teaching should involve maximum use of detailed maps of the countries, Students should be encouraged to use atlas in classrooms. Video shows about culture, physiography and economy of these countries may be arranged if possible.



**Geography**  
**Paper-B**  
**Geography of India**

**Time: 3 Hours****Marks: 70****Objectives**

To foster comprehensive understanding of physical, human and economics resource base of India.

**Note: Instructions for the paper setters and candidates**

1. A compulsory question on map on India will be set covering the whole syllabus. This question will have 20 parts. The students will attempt any 15 parts in about 15-20 words each. Each part will carry 2 marks (total 30 marks). (Location and Explanation).
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 four questions selecting one question from each unit. These will be in addition to compulsory question at serial number one.

**Course Content****Unit-I**

India in the context of South Asia, Asia and the World. Relief, drainage, climate, vegetation and soils.

**Unit-II**

Mineral Resources: Iron-ore, manganese, mica, copper, gold; and power resources. Population : Numbers, distribution and density, growth, migration, urbanization, religious composition.

**Unit-III**

Agriculture-Characteristics of Indian agriculture; land use pattern, irrigation, major crops (rice, wheat, jowar, maize, sugarcane, cotton, jute, tea, groundnut), areas of surplus and deficit food production, problems of Indian agriculture.

**Unit-IV**

Industries-Distribution and localization factors of major industries (iron and steel, cotton textiles, sugar, fertilizers, cement), role of the public sector in Indian economy. *Transport* : Rail, Road, airways and waterways; International Trade.

**Books Recommended:**

1. Deshpande, C.D.: India: A Regional Interpretation, Northern Book, Centre, New Delhi.
2. Johnson, B.L.C.: South Asia, Heinemann, London, 1981.
3. Spate, O.H.K. & Learmonth, A.T.A.: India and Pakistan: A General and Regional Geography, Methuen, London, 1967.
4. Tirtha, Ranjit & Krishan, Gopal: Emerging India: A Geographical Introduction, Conoub, Ann Arbor, Michigan (U.S.A.) 1992.
5. Malkiat Singh: Geography of India, Rasmeet Prakashan, Jalandhar.
6. D.S. Mankoo: Geography of India, Kalyani Publishers, Jalandhar.
7. D.R. Khullar: Geography of India, New Academic Publishing Co., Jalandhar.

## Geography Paper-C

### Map Projections and Field Report

**Time: 3 Hours**

**Marks: 60**

**Distribution of Marks:**

|   |          |
|---|----------|
| (i) Written paper of three hours covering all the units to be held alongwith the theory papers. | 25 Marks |
| (ii) Practical Record relating to Map Projections.  | 15 Marks |
| (iii) Viva Voce on Practical Record relating to Map Projections                                 | 5 Marks  |
| (iv) Field Report   | 10 Marks |
| (v) Viva Voce on Field Report   | 5 Marks  |

**Objectives:**

To Provide an analytical understanding of use of common map projections.

To acquaint the students with the importance of field work as one of the methodologies in geography.

To sensitize the students about pre-field work and post-field work i.e. data processing and analysis and writing of field work report.

#### Unit-I

General introduction and classification of projections, constructions, properties, limitations and use of projections, general principles of identification and choice of projections.

#### Unit-II

Construction, properties and limitations of following map projections:

Cylindricals: Plate Carree, Equal-area and Mercator's

Conicals: One Standard Conic, Two Standard Conic, Bonne's Polyconic and International.

#### Unit-III

Construction, properties and limitations of following projections:

Zenithals: Gnomonic, Sterographic, Orthographic, Equidistant and Equal Area (Polar cases only).

Conventionals: Sinusoidal and Molleweide's (normal case only).

#### Unit-IV

**Field work (Theory):**

(i) Role of Fieldwork in geography.

(ii) Scale of study and field work methodology.

(iii) Methods of collecting primary data, questionnaire, observation and measurement.

(iv) Methods of field study of : a farm, a village, a town and Physical features of an area.

## **Geography**

### **Field work (Practical)**

A field report of minimum 10 pages written in candidate's own hand will be prepared based on primary data on problems such as (a) local market survey; (b) service area of school/on hospital; (c) traffic flow; and (d) socio-economic characteristics of student's village/mohallas/sector.

**Notes:**

1. A compulsory question containing 8 short answer type questions will be set covering the whole syllabus. The students will attempt all 5 parts in about 25-30 words each. Each part will carry 1 mark. (Total 5 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 and Field report will be done at the time of viva-voce examination. A minimum of 15 sheets are to be prepared by each student. There will be no laboratory exercise at that time.
4. In case, the candidate has applied for 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. Jones, P.A.: *Fieldwork in Geography*, Longman, London, 1968.
2. Kellaway, George P. : *Map Projections*, Methue, and Co., London.
3. Singh, Gopal: *Mapwork and Practical Geography*, Surjeet Book Depot, Delhi, 1993.
4. Singh, Malkiat: *Cartography*, Rasmeet Prakashan, Jalandhar, 2006.

**Further Readings:**

1. Archer, J.E. & Dalton T.H.: *Fieldwork in Geography*, E.T. Bastford Ltd. London, 1968.
2. Hudson, F.S. : *A Geography of Settlements*, MacDonald, London, 1970.
3. Singh, L.R. : *Practical Geography*, Chaitanya, Publishing House, Allahabad, 2006.

**Journalism and Mass Communication**  
**Paper-A**  
**Advertising**

**Time: 3 Hours**

**Max. Marks: 100**

**Instructions for the Paper Setters:**

**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**.

Definition, need, concept and role; Difference in Publicity, Advertising, Propaganda, Types of advertising, Ad agencies-Organisational setup and functions, Copy Writing, Parts of an advertisement, Attributes of an effective copy, types, design and layout. Advertising and its impact. Modes of advertising, Appeals. Advertising Code, Advertising in Various media.

**Book Recommended:**

Advertising Sontakki 1994, Kalayani Publishers, New Delhi.

**Journalism and Mass Communication**  
**Paper-B**  
**Public Relations**

**Time: 3 Hours**

**Max. Marks: 100**

**Instructions for the Paper Setters:**

**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**.

PR-Definition, Concept and Role, Qualities of a PR person, Publics, PR in public & private sector  
Difference between PR & advertising, Various PR Organisations, Organising a Press, Conference,  
Various tools of PR, Writing Press, Releases and reports, Need for PR; Objectives, Publics of PR, Code  
of Ethics.

**Book Recommended:**

Handbook of Public Relations: D.S. Mehta, 1998, Allied Publishers, New Delhi.

**Mass Communication & Video Production**  
**Paper-A: Video for Communication**

**Time: 3 Hours****Marks: 60****Instructions for the Paper Setter:**

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

- **Part-A** consists of 10 questions carrying 2 mark 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.

**Video Camera**

- Basic Design (Lens, Zoom, Aperture, Focal Length, Shutter)
- Camera Angles, Movements, Shots & Mountings
- Types of Cameras (VHS), Umatic, Betacam, High Eight, Video Eight)

Camera Crew (Director, Producer, Production Manager, Floor

Manager, Art Director, Makeup Man, Dress Designer, Choreographer

Lighting (Types, Luminants, accessories, lamps, & lighting problems) Programme Proposal

Budgeting

Location Survey

Shooting Script

Pre & Post Production Meeting

Single Camera & Multicamera Shooting

Indoor & Outdoor Shooting

**Practicals****Marks: 40**

**Mass Communication & Video Production**  
**Paper-B: Video Electronic Film Production**

**Time: 3 Hours****Marks: 60****Instructions for the Paper Setter:**

There shall be three parts i.e. A, B &amp; C in each.

- **Part-A** consists of 10 questions carrying 2 mark 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.

**Videoediting**

- Meaning
- Need
- Types (Online, Offline, Linear & Non-linear)
- Transitional

Devices (Cut, Fade, Dissolve, Mix, Superimposition, Wipe &amp; Montage)

**Special Effects**

- Audio Special Effects
- Video Special Effects
- Recording Special Effects

**Narration**

- Meaning and Role
- Writing & Recording Narration

**Sound Mixing & Editing**

- Basics
- Dubbing
- Studio Mixing
- Laying Tracks
- Pre & Post Production Mixing

**Studio & Location Sound Media Appreciation**

- Film Review
- Film Criticism
- Film Journalism
- Film distribution & Marketing

**PRACTICALS****Marks: 40**

Making a minimum of five minute programme (any format) Reading a programme/films.

**Recommended Books:**

Writing Scripts for TV Radio and Films: Wills, Edgar-Chicago, Holt and Rinehart, 1981  
 Lyver and Svainson

Basics of Video Production: Des, Lyver and Svainson, Graham- Focal Press

**Television Production: Gerald Millerson-Focal Press, 1999.**

**Note: Practicals to be conducted by external examiner.**

**Education**  
**Paper-A**  
**Development of Education**

**Time: 3 Hours**

**Max. Marks: 100**

**Note:-**

- 1. There will be eight questions in all, four questions from each section.**
- 2. The candidates are required to attempt at least two questions from each section and total five questions.**

**Section-I**

1. Constitutional Provisions of Education.
2. Meaning & Importance of Elementary Education.
3. Problems of Education and Role of the State in Elementary Education.
4. Role of Sarv Shiksha Abhiyan in strengthening elementary Education.

**Section-II**

1. Right to Education Act 2009.
2. Aims, Objectives and Problems of Secondary Education.
3. Functions of NCERT, SCERT, PSBE, CBSE.
4. Meaning & Importance of Vocationalization of Education.

**Books Recommended:**

1. Aggrawal, J.C.: Modern Indian Education; History Development and Problems, New Delhi, Shipra Publication House, (2006).
2. Bhatnagar, Suresh: Modern Indian Education and its Problems, Meerut, R. Lall Book Depot. (2006).
3. Sodhi, T.S.: Emerging Trend in Indian, Patiala, Bawa Publication, 2007.
4. Bhullar, G.K.: Emerging Indian Education: Challenges and Trends, Jalandhar, Modern Publishers, (2010).
5. Sharma, Y.K.: History and Problems of Education. New Delhi Kanishka Publication (2004).
6. Bhatia, K.K.: Modern Indian Education and its Problems, Ludhiana, Vinod Publication (2008).



**Education**  
**Paper-B**  
**Development of Education**

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

1. There will be eight questions in all, four questions from each section.
2. The candidates are required to attempt two questions from each section and total five questions.

**Section-I**

1. Salient features of National Policy on Education of 1986.
2. Education in the Eleventh Five Year Plan.
3. Globalization : Meaning Characteristics and Problems. Role of Education in Globalization.

**Section-II**

1. Distance Education : Meaning, Characteristics, Need and Importance and Modes of Distance Education with special reference to Open School, Open University, Correspondence Courses.
2. Problems and Prospects of Education for the 21st century.
3. Environmental Education: Meaning, Need of Environmental Education, Role of Training in Environmental Education.

**Books Recommended:**

1. Govt. of India, Ministry of Education, Report of Education Commission (1964-66), New Delhi, 1966.
2. Kochhar, S.K. Pivotal Issues in Education, New Delhi: Sterling Publishers, 1984.
3. Kaur, K., Education in India (1781-1985): Policy, Planning and Implementation, Chandigarh: Centre for Research in Rural and Industrial Development, 1985.
4. Govt. of India Ministry of Human Resource Development, National Policy on Education, New Delhi, 1986.
5. Govt. of India, Eleventh Five Year Plan, New Delhi.
6. Narula & Naik, J.P. Bharat wih Vidyak Sikhya Da Itihas, Patiala: Punjabi University.
7. Safaya, R.N. & Shaida, B.D., Principles & Techniques of Education, Dhanpat Rai & Sons, Delhi, (1983).
8. Govt. of India. Challenge of Education: A Policy Perspective, New Delhi, 1986.
9. Sharma, R.N., Educational Philosophical Kanishka Publishers, New Delhi, 2005.
10. Govt. of India, Ministry of Human Resource Development, Programme of Action, New Delhi, 1986.
11. Govt. of India, Ministry of Human Resource Development, National Policy on Education, 1986 (with Modifications undertaken in 1992), New Delhi, 1992.
12. Srivastva, D.S., Elementary Education, Isha Books Publishers, New Delhi, 2007.
13. Bhatnagar, Suresh Saxena, Anamika; Modern Indian Education and its Problems R. Lall Book Publishers, Meerut, 2007.
14. Aggarwal, J.C., Landmarks in the History of Modern Indian Education, Vikas Publishing House, Pvt. Ltd., New Delhi, 2004.
15. Bhatia K.K. Chadha P.C., Kadyan, K.S. Sharma, S.; Modern Indian Education and its Problems, Parkash Brothers Ludhiana, 2005.
16. Chakravarti, M., Education in the 21st Century, Kalpaz Publishers, New Delhi, 2007.
17. Dani, H.M., Environmental Education, Publication Bureau, Punjab University, (1996).

## Physical Education Paper-A

**Time: 3 Hours.**

**Marks: 60**

**Note:- 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. Recreation: Meaning and importance of recreation.
2. Aims and objectives of recreation.
3. Intramural and extramural.
4. Tournaments: Draw of fixture, types of tournaments.
  - (a) Knock Out
  - (b) League
  - (c) Combination Tournament
  - (d) Challenge Tournament
5. Organisation of Camps, play days (Sports Meet)

### Part-B

1. Posture: Meaning and types of postures.
2. Postural-Deformities: Spinal foot and Knock-Knees, their causes and corrective exercises.
3. Meaning and importance of kinesiology.
4. Joints, muscles, their types and movements.
5. Therapeutic Exercises, their classification and benefits.

**Practicals: 40 Marks (Internal 10; External 30)**

6. Any One Game (Except the games taken in previous classes), Ground-marking.

**Practical Note-Book**

## Physical Education Paper-B

**Time: 3 Hours**

**Marks: 60**

**Note:-** 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. Effect of exercises on muscular, respiratory and circulatory systems.
2. General concept of Vital capacity, blood pressure, general and specific conditioning.
3. Muscular contraction: Eccentric, concentric, motor unit, isotonic, isometric, Isokinetic exercises.
4. Components of Physical fitness, speed, strength, endurance, agility and flexibility.
5. Laws of motion, lever and its types, Equilibrium, its types and laws, centre of gravity, force and its types.

### Part-B

1. Meaning and aims of sports training.
2. Normal load, creast load, over load.
3. Training Method; Circuit, interval, fartlek, weight-training and cross country.
4. Methods of improving strength, speed, endurance, flexibility and agility.
5. Need and scope of coaching in India. Professional preparation of coaches. Qualifications and responsibilities of a coach.
6. Meaning Importance of warming up and cooling down in sports.

### **Practical Athletics: 40 Marks (Internal 10, External 30)**

One Throw

One Jump

One Race (200 M'400 M.), Track Marking

### **Books Recommended:**

1. Singh Kanwaljeet and Singh Inderjeet: Sports Sociology, Friends Publication, New Delhi 2000.
2. Tandon 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.

**PHILOSOPHY****Paper-I****Western Metaphysics and Epistemology****Time allowed: 3 hours****Max. Marks: 100****Lectures to be delivered: 75****Pass Marks: 35%****Note: Instructions for the Paper-Setter**

The question paper will consist of five sections: A,B,C,D & E. Sections A,B,C, & D will have two questions from each respective section of the syllabus and each question will carry 15 marks each. Section E, will consist of 10 short answer type questions, which 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 from each section A, B, C, and D of the question paper and the entire Section E.

**Section-A**

1. Introduction to Western Philosophy: Nature, Scope and Utility
2. Idealism: Subjective (Berkeley) and Objective (Plato).
3. Materialism: Mechanical and Dialectical.

**Section-B**

4. Monism (Spinoza)
5. Dualism (Descartes)
6. Pluralism (Leibnitz)

**Section-C**

7. Rationalism: Definition, Scope and Characteristics
8. Empiricism: Definition, Scope and Characteristics
9. Realism: Definition, Scope and Characteristics

**Section-D**

10. Existentialism: Scope and Characteristics
11. Logical Positivism: Scope and Characteristics
12. Pragmatism: Scope and Characteristics

**Section-E**

Ten short answer type questions

**Recommended Readings:**

1. Ayer,A.J., *20th Century Philosophy*.
2. Bahm,A.J., *Philosophy An Introduction*
3. Stephen, Conner, *Fundamental Questions in Philosophy*.
4. Titus, H. , *Living Issues in Philosophy*, Eurasia, New Delhi, 1968.

**B.A. Part-III****Philosophy****Paper: II****Opt. (i) Indian Metaphysics and Epistemology****Time allowed: 3 hours****Max. Marks: 100****Lectures to be delivered: 75****Pass Marks: 35%****Note: 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 each respective section of the syllabus and each question will carry 15 marks. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40 marks in all, each short answer carrying 4 marks.

**Instructions for the Candidates**

Candidates are required to attempt one question each from the section A, B, C, and D of the question paper and the entire section E.

**Section-A**

1. Introduction to Salient Features of Indian Philosophy (Orthodox and Heterodox systems).
2. Concepts of Atman and Brahman in Upanishads.

**Section-B**

3. Carvaka : Materialism
4. Samkhya : Purusa and Prakrti.
5. Advaita Vedanta : Maya and Avidya.

**Section-C**

6. Nyaya Theory of Knowledge—Prama and Four Pramanas.
7. Buddhism: Theory of Causation : (Pratityasamutpada).
8. Vaisheshika : Six Categories.

**Section-D**

9. Jainism: Syadvad
10. Sikhism—Akal Purakh and Jagat Rachna.
11. Yoga Psychology

**Section-E**

Ten short answer type questions.

**Recommended Readings:**

1. Chatterjee and Datta, *An Introduction to Indian Philosophy*, University of Calcutta, Calcutta, 1968.
2. Daya Krishna, *Indian Philosophy : A New Approach*, Sri Satguru, Delhi, 1997.
3. Gupta, S.N., *Bhartiya Darshan*
4. Narain, Iqbal, *Bharatiya Darshan*
5. Nirakari, R.D., *Bhartiya Darshan*
6. Sharma, C.D., *A Critical Survey of Indian Philosophy*, Motilal Banarsidas, Delhi, 1964.
7. Sher Singh, *Philosophy of Sikhism*, Sikh University Press, Lahore, 1945.

**PHILOSOPHY**  
**Paper-II**  
**Opt. (ii) Aesthetics**

**Time Allowed 3 Hours**

**Max. Marks: 100**

**Lectures to be delivered: 75**

**Pass Marks 35%**

**Note: Instructions for the Paper Setter**

The question paper will consist of five sections : A, B, C, D & E. Section A, B, C, will have two questions from each respective section of the Syllabus and each question will carry 15 marks. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and 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 section A, B, C and D of the question paper and the entire Section E.

**Section-A**

1. Aesthetics : Nature, Scope and Utility
2. Form and Content in work of Art
3. Art for Art Sake (Kant), Art for Social Function (Sartre)

**Section-B**

4. Rasa Theory in Indian Aesthetics
5. Main Characteristics of Aesthetic Activity with special reference to Sikhism

**Section-C**

6. Architecture
7. Sculpture
8. Painting and Drawing

**Section-D**

9. Music
10. Poetry
11. Theatre

**Section-E**

Ten Short answer type questions.

**Recommended Readings:**

1. Chaman, Saroj, *Saundrya Shastar*, Punjabi University, Publication, 1997.
2. Chatterji, D.C., *Fundamental Questions in Aesthetics*, Indian Institute of Advanced Studies, Shimla. 1968.
3. Gopal Singh, *Guru Granth Sahib Di Sahitak Visheshta* (Punjabi) New Delhi, National Press of India, 1987.
4. Jhanji, Rekha, *Aesthetic Communication*, New Delhi, M. Manohar Lal, 1985. Sharma, H.L., *Indian Aesthetic and Aesthetics Perspective*, Mansi Prakashan, 1995.
1. Titus, Harold H., *Living Issues in Philosophy*, Eurasia, New Delhi, 1968.

**Religious Studies (ਧਰਮ ਅਧਿਐਨ)**  
**ਪੇਪਰ-ਏ**  
**(Primitive Religion)**

ਸਮਾਂ: 3 ਘੰਟੇ  
ਲੈਕਚਰਾਂ ਦੀ ਗਿਣਤੀ: 75%

ਕੁਲ ਅੰਕ: 100  
ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ: 35%

**ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ:**

ਪੇਪਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ: ਓ,ਅ,ਏ,ਸ, ਅਤੇ ਹ; ਭਾਗ ਓ,ਅ,ਏ,ਸ ਵਿਚੋਂ 2-2 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਵਿਦਿਆਰਥੀਆਂ ਨੇ ਇਕ-ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਹੋਵੇਗਾ ਅਤੇ ਹਰ ਇਕ ਪ੍ਰਸ਼ਨ ਦੇ 15 ਅੰਕ ਹੋਣਗੇ। ਭਾਗ ਹ ਵਿਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ 10 ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹੋਣਗੇ, ਜਿਹੜੇ ਸਾਰੇ ਸਲੇਬਸ ਵਿਚੋਂ ਹੋਣਗੇ ਅਤੇ ਉਨ੍ਹਾਂ ਦੇ 40 ਅੰਕ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 4-4 ਅੰਕ ਹੋਣਗੇ।

**ਪ੍ਰੀਖਿਆਰਥੀ ਲਈ ਹਦਾਇਤਾਂ:**

ਭਾਗ ਓ,ਅ,ਏ,ਸ ਵਿਚੋਂ ਕੇਵਲ ਇਕ-ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਹੈ ਅਤੇ ਭਾਗ ਹ ਦੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਜ਼ਰੂਰੀ ਹਨ।

**ਭਾਗ (ਓ): ਪ੍ਰਾਚੀਨ ਧਰਮ**

1. ਪ੍ਰਾਚੀਨ ਮਨੁੱਖ ਅਤੇ ਉਸ ਦਾ ਧਰਮ: ਕੁਦਰਤ ਦੀ ਕਰੋਧੀ ਅਤੇ ਧਰਮ ਦਾ ਆਰੰਭ
2. ਮੁਢਲੇ ਧਾਰਮਿਕ ਵਿਸ਼ਵਾਸ: ਐਨੀਮਿਜ਼ਮ, ਮਾਨਾ (Mana), ਟੋਟਮ
3. ਧਾਰਮਿਕ ਪ੍ਰਗਟਾਵੇ: ਜਾਦੂ, ਮਿਥ, ਟੈਬੂ

**ਭਾਗ (ਅ): ਧਰਮ ਦੀ ਪ੍ਰਕ੍ਰਿਤੀ**

1. ਧਰਮ: ਪਰਿਭਾਸ਼ਾ ਤੇ ਸਰੂਪ
2. ਧਰਮ ਤੇ ਦਰਸ਼ਨ: ਸਮਾਨਤਾ ਅਤੇ ਅੰਤਰ
3. ਧਰਮ ਤੇ ਨੈਤਿਕਤਾ: ਸਮਾਨਤਾ ਅਤੇ ਅੰਤਰ

**ਭਾਗ (ਏ): ਧਰਮ ਸੰਸਕਾਰ**

1. ਧਰਮ ਸੰਸਕਾਰ: ਅਰਥ ਅਤੇ ਸਰੂਪ
2. ਜਨਮ ਅਤੇ ਧਰਮ ਪ੍ਰਵੇਸ਼ (initiation) ਸੰਸਕਾਰ
3. ਮ੍ਰਿਤਕ ਸੰਸਕਾਰ

**ਭਾਗ (ਸ): ਧਰਮ ਦਾ ਸਮਾਜ-ਸ਼ਾਸਤਰ**

1. ਤੀਰਥ ਯਾਤਰਾਵਾਂ ਦਾ ਸਮਾਜਿਕ ਮਹੱਤਵ
2. ਧਾਰਮਿਕ ਤਿਉਹਾਰਾਂ ਦਾ ਸਮਾਜਿਕ ਮਹੱਤਵ
3. ਅੰਤਰ-ਧਰਮ ਸੰਬੰਧ

**ਭਾਗ (ਹ): ਸੰਖੇਪ ਉੱਤਰ ਵਾਲੇ 10 ਪ੍ਰਸ਼ਨ****ਸੁਝਾਈਆਂ ਪੁਸਤਕਾਂ ਦੀ ਸੂਚੀ:****ਪੰਜਾਬੀ**

1. ਅਮੋਲ, ਸ.ਸ., *ਧਰਮਾਂ ਦੀ ਮੁਢਲੀ ਜਾਣਕਾਰੀ*, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 1988.
2. ਸਾਹਿਬ ਸਿੰਘ, *ਧਰਮ ਤੇ ਸਦਾਚਾਰ*, ਸਿੰਘ ਬ੍ਰਦਰਜ਼, ਅੰਮ੍ਰਿਤਸਰ, 1962.
3. ਤਾਲਿਬ, ਗੁਰਬਚਨ ਸਿੰਘ ਅਤੇ ਜਨਮ ਸਿੰਘ (ਅਨੁ.) *ਧਰਮ ਦੀ ਉਤਪਤੀ ਤੇ ਵਿਕਾਸ*, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।
4. ਤਾਰਨ ਸਿੰਘ (ਅਨੁ.) *ਧਰਮ ਦੀ ਉਤਪਤੀ ਤੇ ਵਿਕਾਸ*, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 1977.
5. ਵਜ਼ੀਰ ਸਿੰਘ, *ਧਰਮ ਦਾ ਦਾਰਸ਼ਨਿਕ ਪੱਖ*, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 1989.

**English Books:**

1. Buck, C.H., *Faiths, Fairs and Festivals of India*, Low Price Publications, Delhi, 2005.
2. Finogan, J., *The Archaeology and World Religion*, Princeton, New Jersey, Vol.I, 1952.
3. Hopkins, E.W., *The Origin and Evolution of Religion*, Yale University Press, 1923.
4. James, E.O., *History of Religion*, Great Britain, 1964.
5. Jha, Makhan, *Dimensions of Pilgrimage*, Inta India Publications, New Delhi, 2005.
6. Prester, Henry H., *Primitive Religions in India*, Madras, 1971.



**Religious Studies (ਧਰਮ ਅਧਿਐਨ)**  
**ਪੇਪਰ-ਬੀ (Study of Religion)**  
**ਧਰਮ ਅਧਿਐਨ**

ਸਮਾਂ: 3 ਘੰਟੇ

ਕੁਲ ਅੰਕ: 100

ਲੈਕਚਰਾਂ ਦੀ ਗਿਣਤੀ: 75%

ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ: 35%

**ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ:**

ਪੇਪਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ: ਓ,ਅ,ੲ,ਸ, ਅਤੇ ਹ; ਭਾਗ ਓ,ਅ,ੲ,ਸ ਵਿਚੋਂ 2-2 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਵਿਦਿਆਰਥੀਆਂ ਨੇ ਇਕ-ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਹੋਵੇਗਾ ਅਤੇ ਹਰ ਇਕ ਪ੍ਰਸ਼ਨ ਦੇ 15 ਅੰਕ ਹੋਣਗੇ। ਭਾਗ ਹ ਵਿਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ 10 ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹੋਣਗੇ, ਜਿਹੜੇ ਸਾਰੇ ਸਲੇਬਸ ਵਿਚੋਂ ਹੋਣਗੇ ਅਤੇ ਉਨ੍ਹਾਂ ਦੇ 40 ਅੰਕ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 4-4 ਅੰਕ ਹੋਣਗੇ।

**ਪ੍ਰੀਖਿਆਰਥੀ ਲਈ ਹਦਾਇਤਾਂ:**

ਭਾਗ ਓ,ਅ,ੲ,ਸ ਵਿਚੋਂ ਕੇਵਲ ਇਕ-ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਹੈ ਅਤੇ ਭਾਗ ਹ ਦੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਜ਼ਰੂਰੀ ਹਨ।

**ਭਾਗ (ੳ): ਧਰਮ ਅਧਿਐਨ**

1. ਧਰਮ ਅਧਿਐਨ ਦਾ ਆਰੰਭ
2. ਧਰਮ ਅਧਿਐਨ ਦਾ ਉਦੇਸ਼
3. ਧਰਮ ਅਧਿਐਨ ਦੇ ਮੁੱਖ ਸਿਧਾਂਤਾਂ ਦਾ ਸੰਖਿਪਤ ਪਰਿਚੈ

**ਭਾਗ (ਅ): ਧਰਮ ਦਾ ਦਾਰਸ਼ਨਿਕ ਅਧਿਐਨ**

1. ਧਰਮ-ਦਰਸ਼ਨ (Philosophy of Religion)
2. ਇਲਹਾਮ (Revelation) ਅਤੇ ਧਰਮ ਸ਼ਾਸਤਰ (Theology)
3. ਧਾਰਮਿਕ ਭਾਸ਼ਾ ਦਾ ਸਰੂਪ

**ਭਾਗ (ੲ): ਧਰਮ ਦਾ ਸਮਾਜਿਕ ਅਧਿਐਨ**

1. ਧਰਮ ਦਾ ਸਮਾਜ ਸ਼ਾਸਤਰ (Sociology of Religion)
2. ਧਰਮ ਦਾ ਮਨੋਵਿਗਿਆਨਿਕ ਅਧਿਐਨ
3. ਧਰਮ ਅਤੇ ਸਮਾਜਿਕ ਪਰਿਵਰਤਨ

**ਭਾਗ (ਸ): ਧਰਮ ਸੰਬੰਧੀ ਆਧੁਨਿਕ ਮੁੱਦੇ**

1. ਮਾਨਵਵਾਦ
2. ਵਿਸ਼ਵ ਸ਼ਾਂਤੀ ਤੇ ਸਹਿਹੋਂਦ
3. ਪ੍ਰਯਾਵਰਣਿਕ ਮੁੱਦੇ (Environmental Issues)

**ਭਾਗ (ਹ):****10 ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਪੁਸ਼ਤਕ****English Books**

1. Dea, Thomas O., *Sociology of Religion*. Prentice Hall, New Delhi, 1969.
2. Freud, S. *The Future of An Illusion*. Hogarth, London, 1970.
3. Galloway, *Philosophy of Religion*, T.T. Cleark, 38 George Street, Edinburgh, 1960.
4. Sharpe, Eric J., *Comparative Religion. A History*, Duckworth, London, 1975.
5. Hick, John, H., *Philosophy of Religion*. Prentice Hall, New Delhi, 1978. Wach, Jaochim, *The Comparative Study of Religion*.
6. Mitagawa, Joseph M., *Mircea Eliade & Charles, H. Long* (Ed.)
7. James, William, *Varieties of Religious Experience*. Macmillan, New York, 1968.
8. Jung, *Modern Man in Search of Soul*. A PK Paperbacks, London, 1984.
9. Kristensen, W. B., *The Meaning of Religion*.
10. Margrete, *Mysticism*.
11. Masih, Y., *Introduction of Religious Philosophy*, Moti Lal Banarsi Das, New Delhi, 1971.
12. *The History of Religion, Essays on The Problems of Understanding*.

**ਸੁਝਾਈਆਂ ਪੁਸਤਕਾਂ ਦੀ ਸੂਚੀ:**

1. ਦਰਸ਼ਨ ਸਿੰਘ, *ਧਰਮ ਅਧਿਐਨ ਅਤੇ ਸਿੱਖ ਅਧਿਐਨ*, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2002.
2. ਫਰਾਇਡ, ਸਿਗਮੰਡ, *ਪ੍ਰਮਾਤਮਾ ਦੀ ਉਤਪਤੀ ਤੇ ਇਸ ਦੇ ਭਰਮ ਦਾ ਭਵਿੱਖ*, ਤਰਕ ਭਾਰਤੀ ਪ੍ਰਕਾਸ਼ਨ, ਬਰਨਾਲਾ, 2002.
3. ਮਨਜੀਤ ਸਿੰਘ, *ਧਰਮ ਦਰਸ਼ਨ*, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2007.
4. ਰਾਜੇਸ਼ (ਡਾ.), *ਧਰਮ ਦਰਸ਼ਨ*।
5. ਵਜ਼ੀਰ ਸਿੰਘ, *ਧਰਮ ਦਾ ਦਾਰਸ਼ਨਿਕ ਪੱਖ*, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 1986.

**ਹਿੰਦੀ ਕਿਤਾਬਾਂ:**

1. ਮਸੀਹ, ਯਾਕੂਬ, ਸਾਮਾਨਯ ਧਰਮ ਦਰਸ਼ਨ, ਮੋਤੀ ਲਾਲ ਬਨਾਰਸੀ ਦਾਸ, ਪ੍ਰਾ.ਲਿ., ਦਿੱਲੀ ।

**Music (Instrumental)****Paper-A: Theory: 3 Hours****Paper-B: Practical: 20 Minutes****Internal Assessment based on the Computer****Total Marks: 200****Marks: 80****Marks: 100****Marks: 20****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 for Paper Setters/Examiners are as under:**

1. There should not be more than ten students in a batch for practical examination.
2. While sending the syllabus to paper setter in theory the syllabus prescribed for the practical paper should also be sent.
3. Separate practical paper should be set for each class from practical Paper-B of the prescribed syllabus.
4. The paper setter would 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.
5. Candidates can take both subjects i.e Instrumental and Vocal Music as elective subjects.
6. Candidates can take Tabla subject along with Instrumental Music (mentioned below in Serial No. 7).
7. In Instrumental Music the candidates have the option to take any one of the following instruments: Sitar, Sarangi, Veena, Sarod, Dilruba; Violin, Guitar, Bansuri, Shahnai, Rabab, Saranda, Taus, Santoor and other Instruments. Played on the basis of Indian Classical Music.

**Music (Instrumental)**  
**Paper-A (Theory)****Time: 3 Hours****Marks: 80****Unit-I**

1. Historical development of Music during modern period specially describing the impact of Multi-Media.
2. Detailed knowledge of the following technical terms:- Alap, Jod, Jhalla, Tirobhava, Avirbhava, Meend, Kritan, Kan Ghaseet.
3. Time theory of Raga scientific or unscientific.
4. Write the contribution of your favourite Bharat Rattan Awarded Instrumentalist.
  - i) Pt. Ravi Shankar
  - ii) Bismilah Khan

**Unit-II**

1. **Topic of Essays:**
  - i) Interaction between Folk Music & Classical Music
  - ii) Relation of Ragas with season and time
  - iii) Classification of Indian Music Instruments
  - iv) Rag & Rus
2. Placing of Sudha and Vikrat Swars on the wire of Veena by Shri Niwas.
3. Description and notation of prescribed Ragas (Gats & Toras) Ragas :- Puriya Dhanshree, Chander Kaus, Bhairvi, Hamir, Miyan ki Todi Talas : Jhumara, Deepchandi, Chartal, Tilwars.
4. Brief introduction (Aroh, Avroh, Pakar etc.) Multani, Bhairavi, Khamaj, Bahar, Puriya.

**Unit-III**

1. Different Kirtan Chowkis of Gurmeat Sangeet.
2. Salient features of Gurmat Sangeet.
3. Contribution of Rababi Musicians in Gurmat Sangeet.

**Music (Instrumental)****Paper-B (Practical)****Time: 20 Minutes****Total Marks: 120****Practical Marks: 100****Internal Assessment based on the Computer Marks: 20**

1. Ragas:- Puriya Dhanshree, Chander Kauns, Bhairavi, Hamir, Miyan ki Todi.
2. Two Gats with simple Alaps and Toras in any of the prescribed Ragas.
3. Talas:- Jhumra, Deepchandi, Chartal, Tilwars.
4. To demonstrate the following Talas on tabla. Ek tal, Teen Tal, Jhaptal, Kahrva in vilambit and drut form.
5. One gat in Ektal with Toras and Jhala in any of the prescribed Raga.
6. Use of two Swaras Meend and Kan. Sa Re Ga, Re Ga Ma.
7. One Gat in Dhamar Style with Layakaries.
8. Tuning of the Instruments.
9. Non-detailed :- Multani, Bhairav, Khamaj, Bahar.
10. One Dhun in any Raga

**Books Recommended:**

1. Rag Parichaya Part-III & IV: H.C. Shrivastava. Sangeet Sadan Parkashan Allahabad, 2004.
2. Sangeet Visharad: Basant Sangeet Karyalaya, Hathras, 2004.
3. Hamare Sangeet Rattan: Sangeet Karyalaya, Hathras, 1978.
4. Gurmat Sangeet Vishesh Ank: Sangeet Karyalaya, Hathras, 1997.
5. Niband Sangeet: Javadi Kalan, Ludhiana Sangeet Karyalaya, Hathras (Laxmi Narayan Garg, Editor) 1989.

**Internal Assessment based on the Computer****Marks: 20**

\* **It will be Based on computer aided Programme** in the form of presentation relating to any filed of music. (Approx. 3 to 5 pages) using computer 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****Paper-B Practical: 20 Minutes****Internal Assessment based on the Computer****Total Marks: 200****Marks: 80****Marks: 100****Marks: 20****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 for Paper Setters/Examiners are as given:**

1. There should not be more than ten students in a batch for practical examination.
2. Harmonium will be allowed as an 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 in Unit-III. The candidate may be asked to attempt five questions in all selecting at least one question from each part.
6. Candidates can take both subjects i.e Instrumental and Vocal Music as an elective subject.
7. Candidates can take Tabla subject along with Music Vocal.

**Music (Vocal)**  
**Paper-A**  
**(Theory)**

**Time: 3 Hours**

**Marks: 80**

**Unit-I**

- 1. Historical development of Indian Music in Medieval period with special reference to musicians & their Granths.**
- 2. Knowledge of the following:**
  - a) Drupad, Dhammar, Sargam Geet.
  - b) Importance of Sahayak Nad in Music.
  - c) Folk Music of Punjab.
- 3. Contribution and life sketch of the following:**
  - a) Parveen Sultana.
  - b) Abdul Karim Khan.
  - c) Bade Gulam Ali Khan

**Unit-II**

- 1. Topic of Essay**
  - a) Bhakti Sangeet.
  - b) Importance of Ins. in Vocal Music.
  - c) Light Music & its place in present period.
  - d) Sahitya and Sangeet
- 2. Knowledge of the following**  
Ragalap-Roopkalap-Alaptigan
- 3. Description and notation of the following Ragas:-**  
Darbari, Ramkali, Basant, Sudh Kalyan, Puria Kalyan
- 4. Brief Introduction (Aroh, Avroh & Pakar) of the following Ragas:**  
Todi, Junpuri, Bhairv, Puriya, Bahar
- 5. Tals : Notations of following talas in Ekkgun, Duggun & Chougun laykaries :**  
Deep Chandi, Ada Chautal, Jhumra, Tilwara

**Unit-III**

- I. Classical Gayan Shallies used in Gurmat Sangeet.
- II. Importance of music in Guru Granth Sahib.

**Music (Vocal)**  
**Paper-B**  
**(Practical)**

**Time: 20 Minutes**

**Total Marks: 120**

**Practical Marks: 100**

**Internal Assessment based on the Computer Marks: 20**

- a) One Drut khayal with alaps and Tanas in prescribed Ragas:- Ramkali, Darbari, Shudh Kalyan, Basant, Puriya Kalyan.
- b) Two Vilambat Khayals in any two of the prescribed Ragas in the syllabus.
- c) One shabad with simple Alap and Tan.
- d) Ability to recite the following talas in ekgun and dugun Layakaris, Deepchandi, Jaittal, Adachautal.
- e) Ability to play of the following talas on Tabla: Ektal, Teental, Jhaptal & Kehrva.
- f) One Tarana in any prescribed Ragas.
- g) Ability to sing Khatka, Murki Meend in each prescribed Ragas.
- h) Tuning of Tanpura.
- i) Brief introduction (Aroh, Avroh, Pakar) of the following Ragas : Sham Kalyan, Asavari, Puriya, Poorvi, Bhairav

**Books Recommended:**

1. Hamare Sangeet Rattan: Sangeet Karyala Hathras, 1978.
2. Bhartiya Sangeet Da Itihas: Umesh Joshi Man Sarover Parkashan Farozpur, 1978.
3. Kramika Pustak Malika: Bhatkhande Sangeet Karyala, Hathras, 1999.
4. Niband Sangeet: Sangeet Karyala, Hathras, 1989.
5. Punjab Ki Sangeet Parampara: Dr. Geeta Paintal Radha Publication, New Delhi, 1988.

**Internal Assessment based on the Computer**

**Marks: 20**

\* **It will be Based on computer aided Programme** in the form of presentation relating to any filed of music. (Approx. 3 to 5 pages) using computer 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****Total Marks: 200****Paper-B Practical: 20 Minutes****Marks: 80****Internal Assessment based on the Computer****Marks: 100****Marks: 20****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 examiner are as under:**

1. There should not be more than ten students in a batch for the practical examination.
2. Harmonium will be allowed as accompaniment to perform the Nagma.
3. While setting the syllabus to paper setter in theory the syllabus prescribed for the practical paper should also be sent.
4. Separate practical paper should be sent 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 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 computer aided Internal Assessment based on the Computer in the form of presentation relating to any field 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 mark sheet should be used for Internal Assessment based on the Computer.

**Indian Classical Dance  
Paper-A (Theory)****Time: 3 Hours****Marks: 80****Unit-I**

1. Detailed study of Abhinaya-Darpan.
2. Technique and composition of Indian Ballad.
3. Theory & Technique of Indian classical Dance.
4. Comparative study of folk and classical dances.

**Unit-II**

1. Integration through Dance.
2. History of Kathak Dance its development upto 20th century.
3. Definition of the following:
  - i) Amad, Salami, Tora
  - ii) Laya & Tal in folk Dances
  - iii) Chakardar Tukna, Tihai
4. Essay on the following topics:- Indian Dance & Natya Shastra
  - i) Dance and Religion.
  - ii) Folk Dances are the symbols of old culture.
  - iii) Tradition & improvisation in Dance.
  - iv) Indian Dance & Nataya Shastra.

**Unit-III**

1. Notation of Tora, Tukra, Am ad, Paran, Chakradar Paran prescribed in the course. Paper-B (Practical)
2. Notation of Nagma in Teental and Ada Choutal.
3. Notation of prescribed Talas alongwith Dugan, Tigun, Chaugun and Arhi Layakaries, Teental & Swari.
4. Description of prescribed Talas.

## Indian Classical Dance Paper-B (Practical)

**Time: 20 Minutes****Practical****Internal Assessment based on the Computer****Total Marks: 120****Marks: 100****Marks: 20****1. Ada-Choutal (Matra-14):**

Simple Tatkar in Singhle, Dugun and Chaugun layakaries

|            |   |   |
|------------|---|---|
| i) Aman    | - | 1 |
| ii) Salami | - | 1 |
| iii) Tora  | - | 6 |
| iv) Paran  | - | 2 |

**2. Swari-Tal (Matra-15):**

Four Tatkar

|                 |   |   |
|-----------------|---|---|
| Amad            | - | 1 |
| Tora            | - | 6 |
| Paran           | - | 2 |
| Chakardar paran | - | 1 |
| Kavit           | - | 2 |

**3. Teen Tal-1:**

|                         |   |   |
|-------------------------|---|---|
| i) Tatkar with paltas   | - | 1 |
| ii) Amad                | - | 1 |
| iii) Chakardar Tukra    | - | 2 |
| iv) Paran               | - | 2 |
| v) Chakardar paran      | - | 2 |
| vi) Parmehi paran       | - | 1 |
| vii) V. Tisrajati paran | - | 1 |

4. Demonstrate Lakshmi (18 Matra) with Tatkar, Tukras and Tora.

5. Any two Gat Bhava of the following: Makhan Chori, Panghat ke Chher-Chhar, Shiva Puja.

6. Practical demonstration of Asmyukta and Samyukta hand gestures according to Abhniaya Darpan.

7. Practical Dance demonstrate in Thumri.

**Books Recommended:**

1. Kathak Nritya Ka Prichey Subhashni Kapoor Radha Publications, New Delhi, 1997.
2. Kathak Sundaryatmak Shastriya Nritya Shikhakharey Knishka Publishers, New Delhi, 2005.
3. Itihasik Pripeksh Mein Kathak Naritya Maya Talp Knishka Publishers, New Delhi, 2006.
4. Nibandh Sangeet Laxmi Naryan Garg Sangeet Karyalaya Hathras, 2004.

**Internal Assessment based on the Computer****Marks: 20**

\* **It will be Based on computer aided Programme** in the form of presentation relating to any filed of music. (Approx. 3 to 5 pages) using computer 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****Total Marks: 200****Marks: 80****Paper-B Practical: 20 Minutes****Marks: 100****Internal Assessment based on the Computer****Marks: 20****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 the practical examination.
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 the practical paper should also be sent.
4. Separate practical paper should be sent for each class from practical Paper-B prescribed syllabus.
5. The paper setter will set nine questions in all. (Three question in each unit). The candidate 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 the computer aided 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.
7. Candidates can take Tabla subject with Vocal & Instrumental Music. (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 Music).

**Tabla**  
**Paper -A (Theory)**

**Time: 3 Hours**

**Marks: 80**

**Unit-I**

- a) Historical development of Avnad vadhya.
- b) Importance of Tabla in Vocal & Instrumental Music.
- c) Detailed knowledge of Dakshni Tala System.
- d) Detailed history of Tabla and Pakhawaj.

**Unit-II**

1. The life and contributions towards Music of the following:
  - i) Qadar Bux
  - ii) Ahmad Jan Thirakva
  - iii) Govind Rao Burhanpurkar
2. Essay on the following topics:-
  - i) Importance of Electronic Media in Tal & Tal Yatra
  - ii) Creativity in Tabla performance & Sangat

**Unit-III**

1. Introduction of Prunt and its importance in Tabla.
2. Notation and description of the following Talas in Eggun, Duggun & Chugun Layakaries:-
  - i) Matt Tal
  - ii) Tappa Tal
3. Mohra and paran in Dhammar Tal

**Tabla**  
**Paper-B (Practical)**

**Time: 20 Minutes**

**Total Marks: 120**

**Practical Marks: 100**

**Internal Assessment based on the Computer Marks: 20**

- a) Talas prescribed: Ada Chautal, Tilwara, Dhammar, Matt, Swari and Tappa Talas including the Talas prescribed in the previous class.
- b) Proper Bharat of Ada Chautal, Dhammar, Swari and Tappa on Tabla or Pakhavaj.
- c) Knowledge of playing Chautal, Dhammar-Tal on Pakhavaj.
- d) Playing of all the prescribed Talas with Vocal and Instrumental performances as well SOLO-item.
- e) Tuning of Tabla.
- f) Practical knowledge of the following in the prescribed Talas:  
Dhammar-Quaida, Simple paran, Chakardar paran, Formaishee paran, Jhula paran, Tukra, Mukhra, Mohra, Uthan.
  - i) Swari (15 matras) peshkara, Qaida, Gat, parans.
  - ii) Tilwara-Vilambit, Theka with Sangat.
  - iii) Theka of Mattal (18 Matras) & Tappa Tal, on Tabla.

**Books Recommended:**

1. Sangeet Vishard 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**

**Marks: 20**

\* **It will be Based on computer aided Programme** in the form of presentation relating to any filed of music. (Approx. 3 to 5 pages) using computer 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)**  
**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 painting 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 & C.
- f) The division of marks will be as under :

**Section-A:** 20 marks for 10 short answer questions. Each question carry 2 marks.

**Section-B:** 20 marks for 4 questions. The examiner will set 6 questions the candidates will attempt 4 questions of 5 marks each.

**Section-C:** 20 marks for essay type questions. The examiner will be set 4 questions; the candidate will attempt 2 question of 10 marks each.

**Compartment candidates in the subject of Fine Arts will appear only in theory paper during the supplementary examination. Previous marks of practical papers will be considered for the aggregate.**

**Fine Arts**  
**Paper-A (Theory)**  
**(Drawing & Painting)**  
**Part-I**

**Time: 3 Hours**

**Marks: 60**

**History of Modern Movement in Europe:**

**1. Impressionism**

- (i) Claude Monet
  - a) Impression-Sun rise
  - b) Rouen Cathedral
- (ii) Pierre Auguste Renoir
  - a) Le Moulin de La Galette
  - b) Umbrellas

**2. Post Impressionism**

- (i) Paul Cezeanne
  - a) Card Players
  - b) Still Life
- (ii) Vincent Vangogh
  - a) Starry Night
  - b) Sunflowers

**3 Expressionism**

- (i) Edvard Munch
  - a) Cry
  - b) The Dance of Life
- (ii) W. Kandinsky
  - a) Blue Mountain
  - b) Improvisation No. 30

**4. Cubism**

- (i) Pablo Picasso
  - a) Les Demoiselles d' Avignon
  - b) Guernica
- (ii) Georges Braque
  - a) Still Life with grapes & clairnet
  - b) The Portuguese

**5. Surrealism**

- (i) Salvador Dali
  - a) Persistence of Memory
  - b) Burning Giraffe
- (ii) Max Ernst
  - a) Celebes
  - b) Europe After Rain

**Suggested Readings:**

1. H.W. Aranasan : History of Modern Art, London : Thomas & Hudson, 1988.
2. Read Herbert : Concise History of Modern Painting, London: Thomas & Hudson, 1980.
3. Rowald John : Post Impressionism, London : Thomas & Hudson, 1986.



**PART-B****History of Indian Painting (Modern Period)**

- a) Impact of the British on the Indian art.
- b) Company School of art.
- c) Bengal School of Rabindra Nath Tagore, Nand Lal Bose.
- d) Rabindranath Tagore.
- e) Amarita Shergil.
- f) Jamini Roy.
- g) Contribution of the following in the field of art  
S. Shobha Singh, Dhanraj Bhagat, K.K. Hebber, M.F. Hussain, Satish Gujral.

**Suggested Readings:**

- Archer, W.G.: India and Modern Art.
- Appasamy, Jaya: Rabindranath Tagore and the art of his time.
- Lalit Kala: Monographs on Indian painters and sculptures.
- Journal: Lalit Kala (Contemporary), Roop Lekha.
- H.W. Aranasan: History of Modern Art.

**Suggested Readings:**

1. Great Artists series, London: Parlane, 1993.
2. Satish Gujral, New Delhi: Lalit Kala Academy, 1980.
3. Datta, Ella: Indian Contemporary Art, New Delhi, Vadehra Art Gallery, 1997.
4. Prem Nath Mago: Contemporary Art in India, New Delhi, National Book Trust, India, 2000.
5. Pratima Sheth: Dictionary of Indian Art & Artist, Mapin Publishing Pvt. Ltd., India, 2006.

**Fine Arts****Paper-B  
(Practical)****POSTER****Time: 5 Hours****Marks: 40**

Prepare creative poster for advertisement in any number of colors.

At least six works will be prepared for internal assessment.

**Medium** poster colours  
**Size** ½ Imperial

**Fine Arts**  
**Paper-C**  
**Full Life Study**

**Time: 5 Hours**

**Marks: 40**

Rendering of full life study should be done in Pencil or charcoal. Emphasis should be given to structure, volume, proportion, tones and texture.

**(06 works will be submitted for the session work)**

**Fine Arts****Paper-D****Landscape on the spot/Composition****Time: 5 Hours****Marks: 40**

From memory simple groups of figures, indoors or in landscape setting, on the spot.

**Medium**—Oil, water and pastel colors.

**Size**— $\frac{1}{2}$  Imperial

06 works (3 realistic and 3 stylized based on the any style of modern Indian and western painting) will be submitted for the session work.

50 sketches of the size  $\frac{1}{4}$ th imperial based on paper B, C and D in any medium will be submitted.

**History of Art  
Paper-A****Time: 3 Hours****Marks: 100****Note:**

- i. The question paper should cover the entire syllabus. It may contain very specific short answer questions.
- ii. The paper-setter should set 30 questions in all and student shall have to attempt 20 questions.
- iii. The question can be repeated from the previous question papers.

**Part-A:** History of Indian Painting from C. 1850 to the present times. Company painting: early Oil painters-Raja Ravi Verma; Bengal School with special reference to Rabindranath Tagore; Nand Lal Bose. Rabindranath Tagore; Jamini Roy; Amrita Shergil, D.P. Roy Chowdhary, Sobha Singh, M.F. Hussain, Satish Gujral.

**Part-B :** History of Indian Sculpture from C. 600 A.D. to C. 1300 A.D. Pala & Sena School of Bengal, Bihar and Orissa : Praithara Sculpture of Central and Western India; Chola Sculpture-Stone & Bronze.

**History of Art  
Paper-B****Time: 3 Hours****Marks: 100****Note:**

- i. The question paper should cover the entire syllabus. It may contain very specific short answer questions.
- ii. The paper-setter should set 30 questions in all and student shall have to attempt 20 questions.
- iii. The question can be repeated from the previous question papers.

**Part-A:** History of European Painting and Sculpture from C. 1850 onwards. Impressionism & Post-impressionism, Cubism. Expressionism & abstract Expressionism.

**Part-B:** Theory and Principles of Art and its appreciation. Aesthetic approach of the Indian and the Western Art. Terms-Form, Content, Abstraction, Realism and Naturalism, function of art.

**Suggested Readings for B.A. Part I, II & III**

Coomaraswamy, A.K., The Dance of Shiva

D. Barret, and Gray, B, Painting of India.

Ray, N.R., An Approach to Indian Art.

Saraswati, S.K., A Survey of Indian Sculpture.

Gardner, Helen, Art Through the Ages.

Gombrich E.H., The Story of Art.

Rowland, B., The Art & Architecture of India.

Archer, W.G., Indian and Modern Art.

Arnason H.H., A History of Modern Art.

Aggarwal, V.S., Heritage of Indian Art.

Aggarwal, V.S., Indian Art (English)

Aggarwal, V.S., Bhartiya Kala (Hindi)

Read, Herbert, Meaning of Art.

**Commercial Art**

|   |                                      |
|---|--------------------------------------|
|   | <b>Total: 200 Marks</b>              |
|   | <b>Internal assessment: 20 Marks</b> |
| <b>Paper-A: Theory</b> (Art Appreciation and Advertising)                 | <b>60 Marks</b>                      |
| <b>Paper-B: Practical</b> Indoor Campaign: Folders and Layouts (coloured) | <b>60 Marks</b>                      |
| <b>Paper-C: Practical</b>   | <b>60 Marks</b>                      |
| Outdoor Campaign: Posters and Hoardings (coloured)                        |                                      |

**Note:**

1. In indoor and outdoor campaign, similarity in design, medium, treatment is essential.
2. The question paper should cover the entire syllabus. It may contain very specific short answer questions.
3. The paper setter should set 30 questions in all and student shall attempt 20 questions.

**Commercial Art**  
**Paper-A: Theory****Art Appreciation and Advertising****Time: 3 Hours****Marks: 60**

Development of Printing.

Press in India (Ancient, Medieval, Post Independence) Aesthetic of Commercial Art, Letter Press for printing, Trade mark, Brand name, Preparing Product Packaging, Block Making.

Terms: Fine Screen, Mechanical Tint, Screen Size, Reverse, Negative, Positive, Bleach Out, Spatters, Over Size, Center spread, Briding the Gutter, Cut Out, Blue Tint, Half Tone Process, Doordarshan in Advertising, Art Director, Marketing Executive, Visualizer, Copywriter.



**Commercial Art****Paper -B: (Practical)****Indoor Campaign: Folders and Layouts (Coloured)****Time: 6 Hours****Marks: 60****Indoor Campaign:-**

Layout and Folders (Coloured)

Prepare coloured layout for Magazine

Magazine Size: 8.5 x 11"

Folders Size: 4.5 x 11", 4" x 9"

Topics: Commercial and Educational

During examination, use of stencil, Transfer letters, Screens are allowed. Limited references while preparing layout and folder can be taken.

**Commercial Art**  
**Paper-C: (Practical)**  
**Outdoor Campaign: Posters and Hoardings (Coloured)**

**Time: 6 Hours**

**Marks: 60**

**Outdoor Campaign:-**

Poster and Hoardings.

Colours: 4

Size: ½ imperial

For Posters and Hoardings: Topics like Commercial and Educational Coca-Cola, Archies, NIFT, etc., Donate blood, Donate eyes, Humanity cause, Increase educational Standards, Fashion etc.

**SCULPTURE****Outlines of Tests****Paper I: Theory****Time: 3 Hours****Total Marks: 200****Marks: 60****Paper II: Theory****Time: 10 Hours****Marks: 60****Paper III: Practical****Time: 8 Hours****Marks: 60****Internal Assessment Marks: 20****Paper-I (Theory)****Time: 3 Hours****Marks: 60**

**Note:** i) The question paper should cover the entire syllabus. It may contain very specific short answer questions.

ii) The paper-setter should set 30 questions in all and students shall attempt 20 questions.

iii) The question can be repeated from previous question paper.

Mathura, Sarnath and other Jain Sculptures under Guptas, Pallava's Sculpture including Rath Temples, Sculptures of Sun-temple of Konark, Sculpture of Kailash Nath Temple at Elora, Elephanta Cave, Khajuraho, Chola Bronze Sculpture, Foreign effect on Modern Indian Sculpture and Sculpture after Independence 1947 and their Artists:-

D.P. Roy Chaudhary, Ram Kinker, Paritosh Dass Gupta, Chintamani Ker, Dhan Raj Bhagat, Sankho Chaudhary.

**SCULPTURE**  
**Paper II: (Theory)**

**Time: 10 Hours**  
**(Two Sessions, Two days)**

**Marks: 60**

**Note:** Every student will submit two portraits prepared in the class as sessional works. Head study in clay. Modelling from life-head only in life size. These works should be produced in Plaster cast.

**Paper III: Practical**

**Time: 8 Hours**

**Marks: 60**

**(Two Sessions, Two days)**

**Note:** Every student will submit three composition works done in the class as a sessional work. Composition in round Sculpture based on human figures.

- (a) In case of private candidate, there will be no Internal assessment and the marks obtained in the practical examination shall be proportionately increased.
- (b) Two Sessional works will be assessed by the teacher concerned and shall be submitted to the University through the Principal of the College.

**Books Recommended:**

- |                                 |   |
|---------------------------------|---|
| 1. A Survey of Indian Sculpture | by S.K. Sarswati                            |
| 2. Indian Sculpture             | by Stella Kramrisch                         |
| 3. Moorti Kala ka Itihas        | by S.M. Aggar Ali Kadvi                     |
| 4. The Pelican History of Art   | by Benjamin Rowland                         |
| 5. South Indian Image of Gods   | by H.K. Shastri and Goddess                 |
| 6. Indian Images–Part I, II     | by B.C. Bhattacharya                        |
| 7. South Indian Bronzes         | by O.C. Gangoli                             |
| 8. Bharhut                      | by B.M. Barua                               |
| 9. Jain Sculpture of Mathura    | by V.A. Smith                               |
| 10. Origin of Budha Images      | by Adris Banerjee and Study                 |
| 11. Mathura ki Moorti Kala      | by Neelkanth Purshotam Joshi                |
| 12. An Interesting Survey       | by T.N. Rama Chandran Sculpture from Konark |

**Still Photography & Audio Production**  
**(Vocational)**  
**Paper-I: (Theory) Divided into Part-A & Part-B**

**Time: 3 Hours****Marks: 50****Instructions for the Paper Setters:**

**Section A** will consist of 10 very short answer questions, 5 each from both parts A & B, answer to each question upto 3 to 5 lines. These are compulsory. Each question will carry one mark. **Total 10 Marks.**

**Section-B** will consist of short answer questions with answer to each question upto 2 pages in length. Twelve questions will be set 6+6 from each part and students have to attempt eight in total. Each question will carry 3 marks. **Total 8x3=24 Marks.**

**Section-C** will consist of essay type questions with answers upto 3 to 4 pages in length. Four questions will be set by the examiner and two questions to be attempted by the candidates. Each question from each part will carry 8 marks. Total weightage of the section being **16 Marks.**

**Note:** Audio Visual Theory paper should be given for the setting of question paper to Audio-Visual experts only. And he should be instructed to set the simple question paper not in much detail only to check the awareness of the students.

|                            |   |                                |
|----------------------------|---|--------------------------------|
| Paper-I (Theory)           | - | 50 Marks                       |
| Paper-II (Practical)       | - | 60 Marks (50 Marks Practical)  |
| (Advance Photo Techniques) | - | 10 Marks (Internal Assessment) |
| Paper-III (Practical)      | - | 60 Marks (50 Marks Practical)  |
| (Audio Visual)             | - | 10 Marks (Internal Assessment) |
| On Job Training            | - | 30 Marks (Internal)            |

**Still Photography & Audio Production  
Paper-I: (Theory)****Part-A****Time: 3 Hrs.  
30 Periods****Marks: 50**

1. Pre-script Stage: Background (Research)
2. Communication Objectives–Identify and presentise
3. Target Audience–Identify and presentise
4. Creative Treatment
5. Writing considerations for different forms of A/V Communication.

**Introductory lectures on:**

- Black Board presentation onto flip charts.
- Overhead Projector.
- Hand held picture/chart slide presentation
- Multiprojector single screen with dissolves
- Multiprojector Multiscreen
- Multiprojector Multiscreen with Videoscope, Film Projector and Computer.

**Emphasis on:**

- Multiprojector
- Synchronised A/V
- 6. Steps in marking and A/V. The major steps
- Script
- Visualisation
- Photography
- Graphics
- Audiotrack, and
- Pulsing

**Still Photography & Audio Production**  
**Part-B (Theory)****Total: 40 Periods**

1. Characteristics of sound wave and its propagation.
2. Accoustics, Echo, R.T. Decibets etc.
3. Quality of sound, Frequency reference, S.N ration distortions.
4. Mechanism of Human speech and hearing Physiology and psychology, thresholds of hearing and feelings etc.
5. Microphones–Different types.
6. Mikes–Special types and accessories, wireless, lappet, reflector type, short again.
7. Directional response and polar diagram.
8. Factors governing the selection of mikes.
9. Types of cables and connectors and their uses.
10. Magnetic recording principles.
11. Tape recorders and playback machines.
12. Audio tapes.
13. Post production–Editing, sucking laying trackses.
14. Mixing of sound.
15. Frequency response controls.
16. Monitoring.
17. Difference in the recording, editing and mixing for different media.
18. Audio visual contrast and harmony creative application.
19. Sound recordists role in a production crew.

**Still Photography & Audio Production**  
**Paper-II**  
**Advance Photo Techniques**

**Time: 5 Hours**

**Total Marks: 60 Marks**  
**Practical: 50 Marks**  
**Internal Assessment: 10 Marks**

**Lectures/Practicals**

1. Use a medium format cameras and appreciate the difference.
2. Expose Raw stocks of different kinds, Find out their Characteristics.
3. Use lenses of different kind to see its various uses.
4. Measuring light by using a exposer meter.
5. Colour processing and printing (only demonstrations)
6. Indoor lighting arrangement for Poliant and Table Tops.
7. In-camera Special Effects.
8. Post exposure SFX Special Effects.



**Still Photography & Audio Production**  
**Paper-III**  
**Audio Visual (Practical)**

**Total Marks: 60 Marks**  
**Practical: 50 Marks**  
**Internal Assessment: 10 Marks**  
**45 Period**

1. On slide editing tables.
2. Learn to operate the following equipment:-
  - a) Audio Cassette Player
  - b) Amplifier for Recording
3. Sound Recording
  - a) Use of Microphone
  - b) Cassette Player
  - c) Cassette recording with synch
  - d) Sound Mixer
  - e) Amplifier Monitoring
4. Sound and Narration editing using the following equipment:-
  - a) Cassette Player
  - b) Cassette Recorder
  - c) Amplifier
  - d) Sound Making and Channel
  - e) Operation of Slide Projector
  - f) Sound Making & Channel
  - g) Operation of Slide Projector
  - h) Dissolve Units

**Still Photography & Audio Production**  
**Paper-IV**  
**On Job Training**

(Theory Work)

**Marks: 30**

1. To produce a photo essay as any developmental theme consisting of 5-8 photos of 7"x 9".
2. Production of an A/V Cassettes and Audio Visual single screen, sync sound.

**News and current affairs, development programmes educational theme, Documentaries.**

1. Focal Guide to low light photography–Focal
2. Basic Photography–Landlord Michael–Focal
3. Book of portrait–Leqiski Jorge–Ebury Press
4. Book of special effect photography–Landford–Ebury Focal
5. Colour prints–Coote–Focal
6. Complete encyclopedia of photography–Longford–Dubury Press
7. Creative colour transparencies–Bilhvis–Fontain Press
8. Darkroom handbook–Curtain–Curtain and Louden
9. Effects and experiment in photography–Pet old–Focal
10. Focal guide to 35 mm single lense reflex–Gavnt
11. Focal guide to cameras–Reynolds–Focal
12. Focal guide to colour
13. Focal guide to the darkroom–Gavnt
14. Practical–composition in photography–Buch–Focal
15. Understanding photography–Gavendish–Masshal Gavendish
16. Step by step guide to photography–Landford–Ebury Press
17. Professional photography–Wada–Focal
18. Practical Wildlife photography–Preston Majhon–Focal
19. Portrait photography–Roda–Focal
20. Photography–UPTON–Little Brown & Co.
21. Photography Children–New York TLD.
22. Photographing people and places–Winward
23. Introduction to photography– Rhode–Macmillan publishing
24. Instant picture handbook–Langford–Ebury Press
25. Photoguide to enlarging–Spitzing–Focal
26. Photojournalism–Cilfton C. Eden
27. Photojournalism–The Professional approach–Kenneth Kobra
28. Beginer’s Guide to Colour photography–Colin Day.
29. Lighting for photography–W. Hurenberg.
30. Lighting for portraiture.

**Gemology and Jewellery Design**  
(Vocational)

**Subject: Jewellery Designing & Manufacturing**

**Paper-A: Theory**  
**Paper-B: Practical**

**Total Marks: 200**  
**Theory Marks: 60**  
**Practical Marks: 140**  
**Ext. Asstt. Marks: 100**  
**Int. Asstt. Marks: 40**

**Paper-A: Theory**

**Time: 3 Hrs.**

**Marks: 60**

**Instructions for the 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, C.

**Section-A:** 12 questions will be set by the examiner. Out of 12 questions the candidate will attempt 10 questions of 1 mark each. **10 Marks**

**Section-B:** 12 questions will be set by the examiner. Out of 12 questions the candidates will attempt 8 questions of 4 marks each. **32 Marks**

**Section-C:** Questions will be given to candidates to attempt 2 out of the 4. Each question will carry 9 marks. **18 Marks**

1. **Casting:** Definition, Types of Casting, Process or Steps involved in Casting, Defects.
2. **Enameling:** Definition, Types of Enameling, Preparation of enamels & Metals. Equipments used & problems.
3. **Electroplating:** Definition, Terms used in electroplating, Reasons, Principles, Process of Plating, Electroplating Circuit.
4. **Electroforming:** Definition, Forming, Conductivity, Procedure, Electroplating Cycle.
5. **Chasing and Repouse:** Definition, Tools used, Procedure.
6. **Flexible Shaft:** Its use, Description of Flexible shaft & Accessories used.
7. **Polishing:** Definition, its Compounds, Techniques, Ultrasonic Cleaning.
8. **Chemical Finishing:** Definition, Types of Finishing, Protection.
9. **Riveting:** Definition, Procedure.
10. **Sand Blasting:** Definition, Procedure.
11. **Lowering and Raising the Karat of Gold and Process of Gold electroplating.**

**Gemology and Jewellery Design**  
**(Vocational)**  
**Paper-B (Practical)**

**Total Marks: 140**  
**Ext. Asstt. Marks: 100**  
**(Int. Asstt. Marks: 40)**

**Designing:-**

1. Domestic Jewellery: Creation of 5 final Designs in relation to Indian Jewellery Kundan, Meena Work, & Stone Setting.
2. Export Jewellery: Creation of 5 final designs in relation to Export Market like U.K., USA, China, Germany etc.
3. **Manufacturing of Fashion and Costume Jewellery through Metals:**

**a) Exercises on :-**

- i) Jali Work
- ii) Riveting
- iii) Silver Ring
- iv) Pendant Making
- v) Chasing
- vi) Repouse

Development of bangles, bracelets, Ring, Ear-rings, Pendants, Broaches etc. through metals by using above techniques.

**Commerce****Paper - A**

**Opt. (i) Computer Aided Accounting** **Max. Marks: 100**

**Opt. (ii) Materials Management** **Max. Marks: 100**

**Opt. (iii) Typing and Shorthand** **Max. Marks: 100**

**Paper-B: Business Laws** **Max. Marks: 100**

**Note:** i) The candidates are allowed to use simple (Non-Scientific) Calculators.

ii) Each question paper will consist of three sections as follows:-

**Section-A:** 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 2 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 6 marks. The total weightage of the section being **48 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. Each question will be carry 16 marks; total weightage of the section being **32 marks**.

**Commerce**  
**Paper-A**  
**Option (i): Computer Aided Accounting**

**Time: 3 Hours**

**Marks: 100**

**Part-I**

**(a) Computer Concepts and Data Processing**

Introduction to Computers: Early developments, Computer generations; information representation and storage; basic concepts of Boolean algebra; Binary arithmetic operations; hardware and software; Concepts of data and information; fields, records, files.

Definition of data processing, types of data processing; data processing cycle; common data processing operations; data capture and validation; data validation techniques; introduction to data storage devices.

**Part-II**

**(b) Problem Solving basic Programming**

Problem solving on computers: Algorithms and flowcharts; programming languages and BASIC: Introduction to BASIC language; constants, variables and expressions; Communication with the computer.

Program control, Commands; repetitive computations, arrays and subscripted variables; functions and subroutines; string data manipulation, graphics commands.

(c) Software Lab: Accounting Problems based on the above syllabus. The students are required to develop programmes for various accounting problems.

**References:**

1. Martin and Seymour: Data Processing (Schaum Series, McGraw Hill, 1984).
2. Gotterfried: Programming with BASIC (Schaum Series, McGraw Hill, 1986).
3. Pradeep K. Sinha, Priti Sinha: Computer Fundamentals, BPB Publications, 2005.
4. Grover: Programming in BASIC (Allied Publishers, New Delhi, 1987).

**Commerce****Paper-A****Option (ii): Materials Management****Time: 3 Hours****Marks: 100****Teaching Hours: 80****Period of 45 minutes each****Note:** i) The Candidates are allowed to use simple (Non-Scientific) Calculators.

ii) Each question paper will 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 6 marks; total weightage of the section being **48 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. Each question will carry 16 marks; total weightage of the section being **32 marks**.

Nature and scope of materials management, objectives and functions of materials management; organization of materials management, interdepartment relationships.

Purchasing Management Introduction, Objectives and functions organisation for purchasing, responsibilities of purchase department, determination of purchase, requirements. Purchase procedures inviting tenders and quotations selecting a source, placing an order and follow up; purchasing records and their maintenance; purchasing through approved sources and through D.G.S. and T.D.

Stores Management : Identification of stores, classification and codification of materials on alphabetical, nemonic, numerical, alpha-numerical and column making systems, advantage of classification and codification; stores organisation; receiving section layout and location system, substores, material handling and storage equipment, store accounting.

Inventory Management: Definition scope and objectives of inventory control, ABC analysis, factors requirement of an item, lead time, carrying or holding costs, set up or ordering , costs, shortage or stock out costs re-order point, safety stock, economic order quantity (without shortages), EOQ for price discounts.

Distribution Management: Definition of physical distribution, factors affecting distribution, elements of transport system, pros and cons of various modes of transportation, transportation and non transportation costs. Inter-state tariffs documentation, carrier and consigners liabilities, packing and package costs, packaging fragile, perishable and dangerous goods.

**Recommended/Suggested Books:**

1. Gopalkrishnan, "Handbook of Material Management", Prientice Hall of India, 2007.
2. Menon K.S. "Stores Management", Mac Millan of India Ltd., 2007.
3. Arnold and Ramkrishnan, "Introduction to Materials Management", Pearson Education, 2007.
4. Nair N.K., "Purchasing and Materials Management", Vikas Publications, 2007.
5. Goyal B.C., "Production Management", Pragati Prakashan, 2007.

**Commerce (Elective)****Paper-A****Option (iii): Typing and Shorthand****Time: 3 Hours****Marks: 100****Theory: 70****Practical: 30**

**Note:** The question paper covering the entire course shall be divided into three sections as follows:-

**Section-A** 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 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. Twelve questions will be set by the examiner and eight will be attempted by the candidates. Each question will carry 4 marks. The total weightage of the section being **32 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 be carry 11½ marks; total weightage of the section being 23.

**Theory**

1. Nature, Scope and importance of typewriting.  
Sitting posture, introduction of basic principles, knowledge of essential parts of a typewriter and their usage.
2. Manipulation of fingers on key board–  
Introduction of basic lesson (all the four rows) including operation of side shift keys.
3. Speed development importance of accuracy over speed.
4. Care and upkeep of typewriter. Typewriting accessories, change of ribbon, use of punctuation signs and space to be left after punctuation marks carbon manifoldng.

**Practical**

- Satisfy the curiosity of the students by making him sit on the typewriter in a required manner by inserting and removing the paper and by observing the action of keys when pressed.
- Mastery of key-board, practice of basic lesson on all the four rows. Practice of “quick brown fox jumps straight over the lazy dog” lesson.
- Introduction and manipulation of side shift keys and their use.
- Practice from exercises, after completion of basic lessons to attain speed @ 15 w.p.m.



- |   |   |
|---|---|
| 5. Instructions for stencil cutting. Use of correcting fluid.               | Practice from book exercises @ 15 w.p.m. daily for atleast five minutes and practice in cutting stencils. |
| 6. Display of tabulation work and balance sheets.                           | Typing in printed forms, telegrams and tabulated statements etc.  |
| 7. How to type printed forms, telegrams, minutes notices and legal matters. | Development of speed @ 25 w.p.m. with daily practice.   |
| 8. Revision of theory.  |   |

**Note:** There would be one paragraph of 125 words to be typed @ 25 w.p. m. for 5 minutes carrying 10 marks and their would be 5 marks for sessional work. (The candidate is required to maintain his file through out the year.)

**Books Recommended: (Typewriting Theory)**

1. Typewriting made easy.
2. General instructions regarding typewriting and stencil cutting.
3. A handbook of type writing.

**Typewriting Practical:**

4. Speed and accuracy.
5. Comprehensive course in touch typewriting.
6. Weekly test papers.
7. Any other book suitable to students.

**Theory**

1. Nature, scope, importance of shorthand (this includes basic instructions and introduction).
2. Explanation of consonant and vowel sounds, their indication and their use in shorthand.

**Practical**

Teacher would be required to teach students basic principles of shorthand and practice of constant and vowels (initial lessons.)

Practice from books and reading back at initial Speed it will be required for the whole of the year.

- |   |   |
|---|---|
| 3. Gramalogues—explanation and thier usage in shorthand.  | Dictation and reading back from further exercises,. Transcription from writen shorthand would start from this stage.                            |
| 4. Explanation of diphthongs hooks (initial and final) halving and doubling principles.           |   |
| 5. Diphones, medial semicircles and compound words-general contractions.                          | Practice from book exercise, reading back and Transcription. 5 minutes para dictation and transcription at nominal speed till last examination. |
| 6. Intersections, advanced phraseography and special constractions including legal phraseography. | Dictation from seen and unseen passage (from shorthand book) reading back and transcriptions at normal speed.                                   |
| 7. Quick revision of theory note making techniques—common errors in shorthand of English words.   | Dictation from any exercise of shorthand book. Reading of printed shorthand outlines from Shorthand book.                                       |
| – Introduction of new and advance shorthand outlines.   | The candidate would be required to attain speed @ 60 w.p.m. and transcribe the same @ 12 w.p.m.   |
| 8. Dictation from instructor exercises and preparation for examination.                           |   |

**Note:** There would be one paragraph of 5 minutes of 300 words to be dictated @ 60 w.p.m. and to be typed @ 12 w.p.m. carrying 15 marks.

‘Shorthand Instructor’ is required to give practical knowledge of all the exercises of the book to the learners. Questions for theory would be from the prescribed syllabus but practical (shorthand test) would be from the whole of the book.

**Commerce**  
**Paper-B**  
**Business Laws**

**Time: 3 Hours**

**Max. Marks: 100**

**Note: i) The candidates are allowed to use simple (Non-Scientific) Calculators.**

**ii) The question paper covering the entire course shall be divided into three sections as follows:-**

**Section-A** 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** 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 6 marks: total weightage of the section being **48 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. Each question will carry 16 marks; total weightage of the section being **32 marks**. Law of contract including contract of idemnity guarantee, bailment, pledge and agency.

A. Law of sales of goods.

B. Law of negotiable instructions.

The Punjab shops and commercial establishment act, 1959. Salient provisions relating to Central sales tax and Punjab sales tax act.

**Suggested Readings:**

1. Kuchhal M.C., "Business Law", Vikas Publications, 2007.
2. Gulshan S.S. and Kappor G.K. "Business Law" New Age International Ltd. Publishers, 2007.
3. Batra V.K. and Kaira N.K., "Mercantile Law", Tata McGraw Hill Publishers, 2007.
4. Fiber Larry and Weigle Jerry, "Applied Business Law", Restan Publishing Company, 2007.
5. Ashwathappa and Ready, "Business Law", Himalaya, Publishing House, 2007.
6. Bulachandani K.R. "Business Law", Himalaya Publishing House, 2007.

**Economics**  
**Paper-A**  
**Economics of Development**

**Time: 3 Hours**

**Max. Marks: 100**

**Note: i) The candidates are allowed to use simple (Non-Scientific) Calculators.**

**ii) The question paper consist of three sections–Section A, Section B and Section C.**

**Section-A:** is compulsory and shall consist of 10 very short-answer questions of two marks each with a total weightage of **20 marks**. The candidates are required to answer each question in/up to five lines.

**Section-B:** shall consist of 12 questions and the candidates will be required to attempt any eight. Each question shall carry six marks with a total weightage of **48 marks**. The candidates are required to answer each question in/up to two pages.

**Section-C:** shall consist of four questions and the candidates will be required to attempt any two. Each question shall carry 16 marks with a total weightage of **32 marks**. The candidates are required to answer each question in/up to five pages.

**Economic Development:** Meaning and Measurement, Economic and Non-Economic factors, Nature of Underdevelopment Characteristics of Undeveloped Countries.

**Dualism:** Social and Technological Dualism, Lewis Model of Unlimited Supply of Labour, Problems of Unemployment and Disguised Unemployment, Rostow's Stages of Growth.

**Models of Growth:** Classical, Marxian, Schumpeter's and Harrod-Domar Model of Growth. Strategies of economic development-Balanced vs. unbalanced growth; theory of big push; Libenstrein's critical minimum efforts Thesis, export promotion and import substitution. Choice of technique, Role of planning in under development Coutries, need, objective, strategy, types and problems of planning.

**Suggested Readings:**

1. Rostow W.W.: Stages of Growth
2. G.M. Meier: Leading Issues in Economic Development.
3. Micheal Todaro: Economic Development in the Third World.
4. Higin: Economic development: Theory and Politics.

**Economics**  
**Paper-B**  
**Quantitative Methods for Economists**

**Time: 3 Hours**

**Max. Marks: 100**

**Note: (i) Two-fifth (40 percent) of the questions will be asked from mathematics and three-fifth (60 percent) from statistics portion.**

**(ii) Economic applications of the above techniques may also be asked.**

**(iii) 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 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 6 marks; total weightage of the section being **48 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. Each question will carry sixteen marks; total weightage of the section being **32 marks**.

Sets, Relations and functions and continuity, Derivative of simple function only (excluding log & exponential functions). Maxima for single variable functions. Introduction to matrices-definition, properties & inverse.

Measures of central tendency–Mean, Mode, Median and Geometric Mean, Measures of dispersion. Measure of skewness– Boyle’s & Karl Pearson’s measures.

Simple correlation & regression (ungrouped & grouped data). Interpolation: Concepts and Methods– (Binomial expansion,

Newton and Lagrange’s Method with on Missing value only).

Price Index Numbers–Weighted and unweighted Index numbers, various formulae tests.

**Readings:**

1. Archibald, G. & R.G. Lipsey (1973); Introduction to a Mathematical Treatment of Economics, 2nd ed. Weisdenfeld and Nicholson, London.
2. Yamane, Taro (1968); Mathematics for Economists, 2nd ed. Prentice Hall, Englewood Cliffs, New Jersey.
3. Croxton, F.E. Cowden D.J. and Klein, S. (1973) Applied General Statistics, 3rd. ed., Prentice Hall of India, New Delhi.
4. Fox, I.A. (1972); Intermediate Economic Statistics, Wiley Eastern Pvt. Ltd., New Delhi.
5. Nagar, A.L. and Das, R.K. (1976); Basic Statistics, Oxford University Press, Bombay.
6. Baumol (1973); Economic Theory and Operations Analysis, Prentice Hall of India, Private Ltd., New Delhi.

## Quantitative Techniques Paper-A

**Time: 3 Hours**

**Max. Marks: 100**

**Note: i) The candidates are allowed to use simple (Non-Scientific) Calculators.**

**ii) The question paper shall consist of three sections—Section A, Section B and Section C.**

**Section-A:** is compulsory and shall consist of 10 short answer questions of two marks each with a total weightage of **20 marks**. The candidates are required to answer each question in/up to five lines.

**Section-B:** shall consist of 12 questions and the candidates will be required to attempt any eight. Each question shall carry six marks with a total weightage of **48 marks**. The candidates are required to answer each question in/up to two pages.

**Section-C:** shall consist of four questions and the candidates will be required to attempt any two. Each question shall carry 16 marks with a total weightage of **32 marks**. The candidates are required to answer each question in/up to five page.

**Theoretical Distribution:** Derivation of properties of Binomial, poisson, Normal, Beta and Gamma distributions. (Stress on numerical).

**Sampling:** Various concepts—population, sampling units, complete enumeration versus sample surveys, standard error of estimates. Properties of a good sample, Random and subjective sampling, simple random sampling (with and without replacement), stratified sampling (applications only).

**Sampling Distributions:** Derivation—properties of Z, t, F and  $X_2$  distributions. (Stress on numericals).  
Statistical inference: Estimation properties of a good estimator, methods of estimations, M.L. estimators, Hypothesis Neyman, Pearson Lemma, Tests of significance for large and small sample, Z-test, t-test and F-Test.(Stress on numericals)

**Note:** Economic applications of the above techniques should also be asked.

**Books Recommended:**

1. Sukhatne and Sukhatme: Sampling Theory of Surveys with Applications (1970).
2. Goon, Gupta and Dass Gupta: An Outlines of Statistical Theory, Vol. 1(1977).
3. Kapur and Gupta: Fundamentals of Mathematical Statistics, Sultan Chand, New Delhi.
4. Murry, R. Spiegel: Statistics: Theory & Practical (1972), McGraw Hill, New York.

## Quantitative Techniques Paper-B

**Time: 3 Hours**

**Max. Marks: 100**

**Note:**

**i) The candidates are allowed to use simple (Non-Scientific) Calculators.**

**ii) The question paper shall consist of three sections–Section A, Section B and Section C.**

**Section-A** is compulsory and shall consist of 10 short answer questions of two marks each with a total weightage of **20 marks**. The candidates are required to answer each question in/up to five lines.

**Section-B** shall consist of 12 questions and the candidates will be required to attempt any eight. Each question shall carry six marks with a total weightage of **48 marks**. The candidates are required to answer each question in/up to two pages.

**Section-C** shall consist of four questions and the candidates will be required to attempt any two. Each question shall carry 16 marks with a total weightage of **32 marks**. The candidates are required to answer each question in/up to five page.

Nature and meaning of Econometrics: General Linear models; assumptions, estimations and properties (BLUE).

Gauss-Markov theorem (two variable case), Gauss Markov theorem (more than two variables), tests of significance (Stress on numericals).

Problems of multicollinearity and heteroscedasticity in the regression analysis, specification errors.

Distributed lag models and auto-regressive models. Problems of Auto-correlation; Dummy variables and their uses.

### **Books Recommended:**

1. Koutoyannis, A.: Theory of Econometrics (1978).
2. Gujarat: Basic Economics (1978).
3. Mehta and Madnani: Basic Economics.

**Industrial Economics**  
**Paper-A**  
**Indian Industrialisation: Policy and Performance**

**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:** 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 candidates. Each question will carry six marks. The total weightage of the section 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 candidates will be required to attempt two. Each question will carry sixteen marks. The total weightage of the section being **32 marks**.

Pattern and Rationale of industrialisation in development economy like India; factors promoting and inhibiting industrialisation. Industrialisation in India–Evolution of modern industry, evolution of Industrial policy–1948, 1951, 1956, 1991 and onwards; Role of public sector; Recent trends in Indian Industrial growth– liberalization and privatization; Small scale industry in India. Regional industrial growth in India; industrial economic concentration and remedial measures. Issues in industrial proliferation and environmental preservation; pollution control polices. Institutional Industiral finance-IbDBI, ICICI, SFC, SIDC and Commercial Banks

**Recommended Readings:**

1. Sutcliffe, R.B.: Industry and Under-development, Addison Wesley, London.
2. Kuchhal, S.C: The Industrial Economy of India chaitanya, Allahabad, 1969.
3. Gadgil, D.R.: The Industrial Evolution of India in Recent Time 1860-1939, Oxford University Press, Delhi, 1979.
4. Ahluwalia, I.J.: Industrial Growth in India Stagnation Since mid 1960's.
5. Goyal S.K.: Monopoly Capital Public Policy, Allied, New Delhi, 1979.
6. Chadha, V. and G.S. Bhalla: Indian Industrial Development: The Post Reform Scene.
7. Brahmananda, P.R. and V.R. Panchmukhi: The Development Process of the Indian Economy, Vikas Publications, New Delhi, 1979.
8. Datta, B.: Indian Planning at the Crossroads.
9. Savdesara, T.C.: Industrial Policy and Planning–1947-91: Tendencies, Interpretation and Issues.
10. Kelkar, V.C. and V.V. Bhanoji Rao : Indian Development Policy Imperatives.



**Industrial Economics**  
**Paper-B**  
**Industrial Finance**

**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:** 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 candidates. Each question will carry six marks. The total weightage of the section 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**.

**Industrial Finance:** Meaning, scope, objectives and functions; Sources and methods of industrial finance: Internal and external sources; Short and long term finance; Financial institutions-Commercial banks; finance corporation and industrial development banks.

**Capital budgeting and structure:** Finance of working capital; Evaluation of project investment. Cost of capital and its effect on gearing and company valuation. Financial leverage and capital gearing.

Bank and Non-bank finance; Venture capital; Foreign investment and stock market prices and operations and role of SEBI.

**Recommended Texts:**

1. Pandey, I.M.: Capital Structure and Cost of Capital.
2. Pandey, I.M.: Financial Management, Vikas Publishing House, New Delhi, 2000.
3. Hay, D.A. and Morris D.J.: Industrial Economics: Theory and Evidence, Oxford University Press, London, 1979.
4. Khan, M.Y.: Industrial Finance, Tata Mcgraw Hill, New Delhi, 1980.
5. Gupta, L.C.: The Changing Structure of Industrial Finance in India, Oxford, Clarendon, 1969.
6. Dasgupta, P.S. et.al.: Guidelines for Project Evaluation.

**Agricultural Economics and Marketing  
Paper-A****Time: 3 Hours****Max. Marks: 100****Note:****i) The candidates are allowed to use simple (Non-Scientific) Calculators.****ii) The question paper shall consist of three sections–Section A, Section B and Section C.**

**Section-A:** is compulsory and shall consist of 10 short-answer questions of two marks each with a total weightage of **20 marks**. The candidates are required to answer each question in/up to five lines.

**Section-B:** shall consist of 12 questions and the candidates will be required to attempt any eight. Each question shall carry six marks with a total weightage of **48 marks**. The candidates are required to answer each question in/up to two pages.

**Section-C:** shall consist of four questions and the candidates will be required to attempt any two. Each question shall carry 16 marks with a total weightage of **32 marks**. The candidates are required to answer each question in /up to five page.

Mobilisation and determinants of agricultural surpluses; Terms of trade between agriculture and industry. Farmers terms of trade with special reference to Punjab and their implication for development.

Income and price elasticities of agricultural commodities, Cobb-Webb model. Food system and Food safety, Food and Nutritional Security.

Food Security Nets, Foodgrain losses at different stages. Measures to contain foodgrain losses. Food subsidies, global environmental change and food security.

Marketable and marketed surplus, supply response of marketed surplus to prices, size distribution of marketable surplus. Backward bending supply curve.

Price expectations and uncertainties, market risk, price stabilization measures.

**Readings:**

1. Mamoria, C.B., Agricultural Problems of India, Kitab Mahal, 1985.
2. Kaur, Rajbans, Agricultural Pricing Policies in Developing Countries, Kalyani Publishers, 1984.
3. Chand, Mahesh and Srivastava, A.K., Economics Analysis and Management in Agriculture, Oriented Publishers, 1978.
4. Kainth, G.S., Foodgrain Marketing System in India, Associated Publishing House, 1982.

**Agricultural Economics and Marketing  
Paper-B****Time: 3 Hours****Max. Marks: 100****Note:****i) The candidates are allowed to use simple (Non-Scientific) Calculators.****ii) The question paper shall consist of three sections. Section–A, Section–B and Section–C.**

**Section-A:** is compulsory and shall consist of 10 short- answer questions of two marks each with a total weightage of **20 marks**. The candidates are required to answer each question in/up to five lines.

**Section-B:** shall consist of 12 questions and the candidates will be required to attempt any eight. Each question shall carry six marks with a total weightage of **48 marks**. The candidates are required to answer each question in/up to two pages.

**Section-C:** shall consist of four questions and the candidates will be required to attempt any two. Each question shall carry 16 marks with a total weightage of **32 marks**. The candidates are required to answer each question in /up to five pages.

Marketing Management–Nature, scope and function of marketing management.

Marketing Research–Meaning, scope, importance and techniques.

Marketing of major agriculture commodities , foodgrains, cash crops, milk and poultry, marketing of agricultural input–fertilizers, pesticides and agricultural machinery.

Concept of physical distribution–Role of Public distribution in India, performance and evaluation of public distribution system in India.

Agreement on Agriculture under WTO, Pre and post WTO agricultural trade, Sanitary and phyto-sanitary measures on agriculture.

**Recommended Readings:**

1. Philips, Kotler, Marketing Management Analysis Planning and Control.
2. Gandhi, J.C., Marketing and Managerial Introduction.
3. Neelamegtham, S. Marketing Managerial and the Indian Economy.
4. Bansal, P.C., Agricultural Problems in India.
5. Singh & Sadhu Agri. Problem in India, Himalayan Publishing House, New Delhi, 1986.

**Rural Development**  
**Paper-A: Rural Industries, Delivery System, Rural Poverty**  
**and Irrigation, Power and Forestry**

**Time: 3 Hours****Marks: 70****Teaching Periods: 75****Note:****i) The Candidates are allowed to use Simple (Non-Scientific) Calculators.****ii) The question paper shall consist of three sections as follows:**

**Section-A:** is compulsory and shall consist of 10 short answer type question of 1½ marks each with a total weightage of **15 marks**. The candidates are required to answer each question in/up to five lines.

**Section-B:** shall consist of 12 questions and the candidates will be required to attempt any eight. Each question shall carry four marks with a total weightage of **32 marks**. The candidates are required to answer each question in/up to two pages.

**Section-C:** shall consist of four questions and the candidates will be required to attempt any two. Each question shall carry 11½ marks with a total weightage of **23 marks**. The candidates are required to answer each question in/up to five pages.

Rural Industries: Meaning and Importance; Problems and Difficulties, Measures for Development; Government Policy.

Agro-industries: Meaning and features; Importance and Present status; Problems and Remedies.

The nature of agricultural and industries production system and their relationships; Public and Private delivery system and their importance; Delivery system for supplies of inputs like seeds, fertilizers, insecticides etc. Agriculture supply chains Public Distribution System.

Rural Poverty: Problems and Magnitude; Causes and Remedies; Government Policies.

Role of irrigation and power in rural development; Forests and Forestry development; Major Problems; Lines of Development; Government policy.

**Suggested Readings:**

1. Aggarwal, A.N. and Kundan Lal, Rural Economy of India.
2. Mukerjee, K.B., Community Development in India.
3. Desai, A.R., Rural Sociology in India.
4. Jammu, P.S.(ed) Pendu Punjab vich Samajak Parvartan (special issue of Samajik Vigyan Pattar) Punjabi University, Patiala.
5. Jammu, P.S., Hindustan Vich Samuda Vikas, Punjabi University, Patiala.
6. Bhattacharya, S.N., Rural Industrialization in India.
7. Dhesi, A.S. and Gurmail Singh Rural, Development in Punjab, A Success Story Going Astray, Routledge, New Delhi, 2008 (Edited Book).

**Rural Development**  
**Paper-B**  
**Livestock Production, Time & Energy Management,**  
**Food & Nutrition**

**Time: 3 Hours**

**Marks: 70**

**Total Teaching Period: 70**

**Note:**

**i) The candidates are allowed to use simple (Non-Scientific) Calculators.**

**ii) The question paper shall consist of three sections–Section–A, Section–B and Section–C.**

**Section-A:** is compulsory and shall consist of 10 short answer question of 1½ marks each with a total weightage of **15 marks**. The candidates are required to answer each question in/up to five lines.

**Section-B:** shall consist of 12 questions and the candidates will be required to attempt any eight. Each question shall carry four marks with a total weightage of **32 marks**. The candidates are required to answer question in/up to two pages.

**Section-C:** shall consist of four questions and the candidates will be required to attempt any two. Each question shall carry 1½ marks with a total weightage of **23 marks**. The candidates are required to answer each question in/up to five pages.

**Dairy, Poultry & Piggery:** Breed and breeding methods, Management and care of animals, Sheds, feeding, health, important diseases, Marketing of products, Economics of dairy, Poultry and piggery.

**Fisheries:** Scope of fishery, Species and culturing of fish, Management, feeding, Diseases, Marketing, economics of fishery.

**Bee keeping:** Scope of bee-keeping, Equipment needed, Species, Diseases, economics of bee keeping.

**Time & Energy Management:** Importance, leisure, time and its use, energy management in households and agriculture.

**Food & Nutrition:** Basic food groups, Essential constituents, Vitamins and minerals, Balanced diet.

**PRACTICALS**

**Marks: 60**

**Note:** Six periods per week will be devoted to both theory and practicals. Candidates are expected to have practical knowledge about dairy, poultry, piggery, bee keeping, time and energy management, food and nutrition etc.

**Books Recommended:**

1. D.S. Dev, Poultry Farming.
2. Punjab Agriculture University, Ludhiana Books on Dairying, Fishery and Bee keeping.

**Dairy Farming (Vocational)**  
**Paper-A: (Theory)**

**Time: 3 Hours**

**Periods per week Theory = 6**

**Max. Marks: 100**

**Instructions for the Paper Setters:**

1. Question paper should be set strictly according to the syllabus and in 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 short 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.

**1. Fodder Production**

Importance of green fodder in milk production, recommendations for cultivation of different fodder crops, nutritional value and yield of different fodder crops.

Legume and non-legume fodders. Enhancing nutritional value and yield of fodder crops. Fodder crop rotations and mixtures. Conservation of surplus green fodder. Feeding of green fodder, hay and silage. Fodder trees, bushes and grasses. Availability of fodders in different seasons for animals. Plan for Green fodder production throughout the year for Dairy Animals. Crop residues and byproducts. Enrichment of roughages.

**2. Diseases of Cows and Buffaloes**

Diseases of Nutritional Deficiency. Infectious and noninfectious diseases. Symptoms of different diseases. External and internal parasitic diseases and their control. Prevention of different diseases. Preventive vaccination schedule in a dairy farm. Control of reproductive disease. Use of sanitation and disinfection in disease control in a dairy farm. Diseases transmitted through milk. Veterinary First-Aid Zoonotic-diseases through from animals to man and viceversa. Segregation and quarantine.

**3. Economics of Dairy Farming**

Economic parameters in a dairy farm. Income and expenditure details for upkeep of ten cows/buffaloes rural dairy unit.

Factors affecting profitability of a dairy unit. Advantages of mixed farming.

**4. Marketing of Milk and Milk Products**

Organisation of dairy unit, cooling, storage and transportation of milk. Standardization, homogenization and pasteurization of milk. Types of marketable milk. Processing of milk. Quality control tests of milk and *ghee*. Distribution of milk, Export of milk and milk products.

**5. Role of Govt. departments and institutions in Dairy****Farming**

Role of organizations like Animal Husbandry Department, Dairy Development Board, National Dairy Research Institute, Banks, Co-operatives, P.A.U., GADVASU, Milk Producers' Cooperative Societies, Milk Plants, Private milk plants, their role as stake holders.

**6. Operation Flood**

Role and scope of Dairy Farming in National Economy. National Dairy Development Board, Indian Dairy Development Corporation, Milkfed.

7. Dairy Farm Record Keeping and its importance.

**Dairy Farming (Vocational)**  
**Paper B: Practical**

**Time: 3 hours**  
**Periods per week**

**Total Marks: 100**  
**Practical Marks: 80**  
**Internal Assessment Marks: 20**

**Distribution of Marks:**

|                                   |                 |
|-----------------------------------|-----------------|
| <b>Assignment</b>                 | <b>20 Marks</b> |
| <b>Practical Note book</b>        | <b>20 Marks</b> |
| <b>Four Visits to Dairy Farms</b> | <b>20 Marks</b> |
| <b>Oral Examination</b>           | <b>10 Marks</b> |
| <b>Written Test</b>               | <b>10 Marks</b> |
| <b>Internal Assessment</b>        | <b>20 Marks</b> |

**Note:** Preparation of Practical Note book and Dairy Farm Assignment is compulsory

1. Formulation and costing of Dairy Rations.
2. Expenditure and Income Calculations.
3. Recognition of Disease Symptoms.
4. Recognition of Heat Symptoms.
5. Visit to NDRI Karnal.
6. Two visits to PAU Ludhiana.
7. Filling of Dairy Record Performs.
8. Recognition of External and Internal Parasites.
9. Separation of Cream from Milk.
10. Preparation of Curd, butter, ghee, cheese and khoa.
11. Determining the Value of Dairy Animal.
12. Preparation of Dairy Farm Loan Scheme for Submission to credit Agencies.
13. Judging of lactating Cows and Buffaloes.
14. Practice in Computation of Rations for Dairy Stock.

**Text Books:**

1. A Text book of Animal Husbandry by G.C. Banerjee.
2. A Text book of Livestock Production and Management in Tropics by D.N. Verma.
3. Livestock Production and Management by NSR Sastry and C.K. Thomas.
4. Livestock and Poultry Production by H. Singh and E.N. Moore.
5. Handbook of Animal Husbandry Published by ICAR New Delhi.
6. Thronton's Meat Hygiene by Thronton.
7. Dairy Farming: Extension booklet No. PAU/1992/F/29/P published by Communication Centre, PAU, Ludhiana (Punjab).
8. "Dudharaun Layee Dharay" (Punjabi) Extension booklet No. PAU/1993/F/560 Published by PAU, Ludhiana.
9. Dairy Farm Record Keeping, PAU, Ludhiana (Punjabi) Booklet.
10. Feeding Dairy Cattle Extension booklet published by NDRI, Karnal. (English).



**Office Management and Secretarial Practice  
(Vocational)**

| Year            | Paper                     | Periods per week |           | Marks  |           |           |
|-----------------|---------------------------|------------------|-----------|--------|-----------|-----------|
|                 |                           | Theory           | Practical | Theory | Practical | Int. Ass. |
| 3 <sup>rd</sup> | V. (Office Year Practice) | 5                | 1         | 40     | 40        | 20        |
|                 | VI. (Stenography)         | 2                | 4         | 40     | 40        | 20        |

**The following pattern of setting of question papers shall be followed:-**

- (a) **For Papers-I, II, IV & VI:** The question paper will be divided into two parts. In Part-I, 10 short questions will be set and candidates will be expected to attempt 5 questions. Each question will carry 4 marks. In Part-II, 4 questions will be set and the candidates will be expected to attempt 2 questions. Each question will carry 10 marks.
- (b) **For Papers-III & V:** The question paper will be divided into two parts. In Part-I, 11 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 5 marks.
1. The 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.
  2. A consolidated report on 'On the Job Training' after 1<sup>st</sup> year and 2nd year shall be prepared by every student and must be submitted in the college concerned upto Sept. 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 submit it again incorporating the changes suggested by the examiner within one month from the date of information to the candidate by the concerned college.

**Office Management and Secretarial Practice  
(Vocational)**

**Paper-V  
Office Practice**

**Time: 3 Hours**

**Total Marks: 100**

**Theory Marks: 40**

**Practical Marks: 40**

**Int. Asstt. Marks: 20**

**Note: The candidates are allowed to use simple (Non-Scientific) calculators.**

**Part-A**

**Office Stationery:** Types of papers and envelopes, control of consumption of papers, ink typewriting ribbons, carbon papers, pins, clips, erasers etc. issue thereof, stock and stock record.

**Duplication Methods:**

Photocopying

**Meeting: Notice, agenda, physical facilities, quorum, providing secretarial assistance.**

**Part-B**

**Using Information:**

Using knowledge of making use of Information from different sources. Telephone Directory, Post Office Guide, Railway Time Table, Teleprinter, Telex, Fascimile Telegraphy.

**Making Travel Arrangement:** Preparing tour programme, railways and air reservation, booking hotel accommodation, filling of form for tour advance, preparing T.A. Bills.

**Practicals:**

**1. Practice on Operating the following machines:-**

- |                  |          |
|------------------|----------|
| - Duplicator     | 6 hours  |
| - Photocopier    | 6 hours  |
| - Wood Processor | 20 hours |
| - Scanner        | 8 hours  |

**2. Working in the Office:**

- Maintenance of Register
- Preparation of notice, agenda, resolutions

**3. Telephone Handling**

**Office Management and Secretarial Practice  
(Vocational)  
Paper-VI  
Stenography in English**

**Time: 3 Hours**

**Total Marks: 100  
Theory Marks: 40  
Practical Marks: 40  
Int. Asst. Marks: 20**

**Part-A**

**A. Typing**

**Manuscripts:**

Proof correction-signs and their meaning, process of typing manuscripts, corrections of drafts.

**Tabulations:**

Definition and importance, part of tabulation, procedure for typing, tabulation, typing of book-notes, typing of balance sheet.

**Syllabification of Combination:**

Rules for division of words at line ends, exceptions, formation of special sign with combination of characters.

**Correspondence:**

Typing with proper display  
Typing of business letters  
Typing of official letters

**Part-B**

**B. Shorthand**

Advanced phraseography, phraseology related to business, banking, insurance and administration.

Special list of words.

Arrangement of materials on typewriter desk to facilitate transcription.

Checking and proof reading transcription.

**PRACTICALS**

Marks: 40

Typing

Manuscripts

Typewriting of Manuscripts (typed).

Typewriting manuscripts (handwritten).

Practice on carrying out corrections of drafts.

**Note:-** Computer facilities to do practical on computer.**Tabulations**

Typewriting of tabulations, balance-sheet, invoices, foot notes.

**Syllabification and Combination:**

Typewriting exercises breaking of words at line ends, breaking of words with syllabification rules, typewriting of characters not existing on key boards.

**Correspondence:**

Typewriting unarranged, misspelt and wrongly-typed letters by observing the rules of display.

Typewriting of business, official letters.

**Shorthand**

1. Taking information from other documents in completion of short hand notes.

2. Office style dictation with amendments.

3. Submitting transcribed materials for signature.

4. Marking and filing of shorthand notices after completion of transcription.

**Recommended Drills:**

Throughout the course, there should be a constant emphasis on:

Fluency in shorthand, special care should be taken to expose students to variety of pronunciation.

Formation of well constructed shorthand outlines with the help of facility drills.

Auto mobilisation of grammalogues and phrases.

Daily practice in taking dictation starting at slow speed.

Practice in transcribing the long hand.

Dictation each day should be on practice material to increase the speed and on new matter to improve competence. it should be for timings of 1,3,5,7 and 10 minutes.

Probable work-sites where on the job training may be organised.

Government department offices.

Business/commercial organisation.

Industrial establishments.

Hospitals.

Educational institutions.

Railways, airlines and other transport undertakings.

Banking and insurance organization.

Parliament and state assembly.

Job work centres

This is a tentative list. Principal may be given the complete freedom to select any organistaion. 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 Department/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/filing/office equipment and production

1

3. Stenography work and typing with various executives and sections.

1

4. Sales, advertising and publicity, stores and

1

4 weeks

**Suggested Department/Section for ‘On-the-Job Training’ at the end of second year.**

| Department/Section  | No. of weeks |
|---|--------------|
| 1. Private Secretaries of various executives in different departments 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 students 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) Short Hand**

| Title  | Publisher:                         |
|--|------------------------------------|
| 1. Pitman Shorthand Dictionary                           | A.H. Wheeler & Company             |
| 2. Pitman Shorthand Reading and Dictation Exercises      | Pitman Shorthand School, New Delhi |
| 3. Pitman Shorthand Reading and Dictation Exercises      | Pitman Shorthand School, New Delhi |
| 4. James W.M. Tylor A Commentary on Pitman Shorthand     |                                    |
| 5. Shorthand made easy for beginners with key            | O.P. Kuthiall                      |
| 6. How to start shorthand Speed building                 | –do– & Edger Thrope                |
| 7. How to avoid confusion in outline in pitman shorthand | –do–                               |
| 8. A Comprehensive List of Gramalongs & Contractions     | –O.P. Kuthiall                     |

**(b) Type Writing:**

| Title   | Publisher   |
|---|---|
| 1. H.A. Mehta Typewriting Complete Course     | Mehta Publishing Corporation, Basant Mahal. Wadala (East) Bombay - 4000037. |
| 2. H.A. Mehta Typewriting Office Practice set | Mehta Publishing Corporation, Basant Mahal. Wadala (East) Bombay - 4000037. |
| 3. H.A. Mehta Business Letter typing sets     | Mehta Publishing Corporation, Basant Mahal. Wadala (East) Bombay - 4000037. |
| 4. Typewriting by Md.Khan Dictation Exercises | Chittoor Publishing House, Chittoor, A.P.                                   |
| 5. Layouts and Forms in Typewriting           | State Board of Technical Education, Hyderabad-500022.                       |
| 6. 20th Century Typewriting                   | South-Western Publishing Company, Gincinati, Ohio, USA.                     |
| 7. Typewriting Drills for Speed and Accuracy  | Gregg. Publishing Corporation, USA.   |
| 8. Principle of Typewriting                   | O.P. Bhatia, S.S. Sangal.   |
| 9. Typewriting Speed & Accuracy               | O.P. Kuthials & Thorpe  |
| 10. Typewriting Theory & Practicle            | R.C. Bhatia   |
| 11. Type writing speed & Accuracy-B-I.        | O.P. Kuthiall   |
| 12. -do- B-II                                 | -do-  |

**(c) Office Practice**

1. Office Practice Made Simple By G. Whitehead, 1994.
2. Office Management and Commercial Correspondence By Balraj Duggal, 2005.
3. Office Management and Secretarial Practice By V.P. Singh, Gyan Publishing House, Delhi.
4. Business Correspondence and Office Practice By Nagamia and Bhal Thakkar Publication, Bombay
5. Office Procedure and Secretarial Practices D.P. Katuria-Pitman Publications
6. Office Management R.K.Sharma, Shashi K.Gupta, Sushil Nayar, Kalyani Publishers, 2003.
7. Office Management R.K. Chopra, Himalya Publishing House, 2000.
8. Drafting & Office Procedure Edgen Thrope.
9. Office Practice Made Simple By Geoffrey Whitehead Published by WH Allen, 1974.
10. Modern Office Management By Jain J. Singh, PP, 2007, Deep & Deep Publications.
11. Office Management By Manish Chopra, 2003.

**Tourism & Travel Management**

| Year        | Paper |  | Periods<br>week |   | Marks  |          |
|-------------|-------|--|-----------------|---|--------|----------|
|             |       |  | L               | T | Theory | Int.Ass. |
| 3rd<br>Year | V     | Emerging Concepts for<br>Effective Tourism Development | 3               | 3 | 50     | 50       |
|             | VI    | Information<br>Communication and Automation            | 3               | 3 | 50     | 50       |

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 report will be evaluated by 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 & Travel Management**  
**Paper-V**  
**Emerging Concepts for Effective Tourism Development**

**Time: 3 Hours**

**Total Marks: 100**  
**Theory Marks: 50**  
**Int. Ass. Marks: 50**

Note:

- i) In each paper 10 questions will be set and the candidates will be expected to attempt 5 questions. Each question will carry 10 marks.
- ii) The candidates are allowed to use simple (Non-Scientific) Calculators.

**Part-I**

1. Relevant concepts and preaches for effective tourism development.
  - National Development Council Report on Tourism Development.
  - National Action Plan, 1992.
  - New Policies on Tourism and Civil Aviation.
  - Tourism traffic and its improvisation.
  - Destination development.
  - Sustainable development.

**Part-II**

2. Man Power Development Needs.
3. Management Strategies.
4. Tourism Policy Analysis.
5. Tourism Legislation a Necessity.

**Suggested Readings:**

1. National Development Council Report.
2. National Action Plan, 1992.
3. Reports of World Tourism Organisation.
4. Report Workshop on Tourism Legislation - August 10-11, 1987 IITTM, New Delhi.
5. Report Workshop on Tourism Legislation - February 23, IITTM, New Delhi.



**Tourism & Travel Management**  
**Paper-VI**  
**Information, Communication and Automation**

**Time: 3 Hours**

**Total Marks: 100**

**Theory 50 Marks:**

**Int. Ass. Marks: 50**

**Note:**

- i) In each paper 10 question will be set and the candidates will be expected to attempt 5 questions. Each question will carry 10 marks.
- ii) The candidates are allowed to use simple (Non-Scientific) Calculators.

**Introduction:**

The course covers techniques of communication, presentation & collection information DATA. It also includes basic knowledge of computers in travel fields. The attitudes & behaviour the pattern w.r.t. customer services and their expectation profile of visitors from various destinations is part of the study.

**Part-I**

- Consumer expectation and services & legislation.
- National tourism civil aviation & policy
- Information technology

**Part-II**

- Market research
- Data collection
- Consortiums of airline hotel & wholesalers.

**Suggested Readings:**

1. Bhatia A.K., *Tourism Development Principles and Practices*, Sterling Publishers Pvt. Ltd. New Delhi, 1983.
2. Negi Jagmohan, *International Tourism & Travel: Concepts & Principles*, S. Chand & Co. Ltd., New Delhi, 2004.
3. Anand M.M., *Tourism & Hotel Industry in India*, Prentic, Hall of India, New Delhi, 1996.
4. Foster *Travel & Tourism Management*, Macmillan Publishers, London, 1985.
5. Wahob Sahob, *Tourism Management*, Tourism International Press, London, 1975.
6. Medlik S., *Dictionary of Travel, Tourism and Hospitality*, Oxford University Press, London, 1993.
7. Hussain, A.A., *The National Culture of India*, National Book Trust, New Delhi, 1987.
8. Acharaya Ram, *Tourism & Cultural Heritage of India*, Rousa Publications, Jaipur, 1986.
9. Kanan, S., *Hotel Industry in India*, Deep & Deep Publications, Pvt. Ltd., New Delhi, 2008.
10. Batra, G.S. & Chawla A.S., *Tourism Management: A Global Perspective*, Deep & Deep Publications, Pvt. Ltd., New Delhi, 2008.
11. Gupta, S., & Bansal, S.P., *Tourism towards 21st Coutry*, Deep & Deep Publications, Pvt. Ltd., New Delhi, 2008.
12. Batra, Sutheshna, S., *Tourism Development Revisited: Concept, Issues & Paradigms*, Edited book, SAGE Publication, New Delhi, 2008.

**Tax Procedures and Practice**

| Year | Paper  | Periods per Week |   | Ext. | Marks |    |
|------|--|------------------|---|------|-------|----|
|      |  | L                | T |      | Int.  |    |
| 3rd  | <b>Paper-A: Central Excise-Procedures &amp; Practice</b> | 3                | 3 | 80   |       | 20 |
|      | <b>Paper-B: Customs-Procedure &amp; Practice</b>         | 3                | 3 | 80   |       | 20 |

1. The Internal assessment shall be based on periodical tests, written assignments and class-participation.
2. A consolidated Report on 'On the Job Training' after Ist year and 3rd year shall be prepared by every student and must be submitted in the college concerned upto July 15. 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 Procedures and Practice**  
**Paper-A**  
**Central Excise–Procedure & Practice**

**Time: 3 Hours**

**Total Marks: 100**  
**Theory Marks: 80**  
**Int. Ass. Marks: 20**

**Note:** 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 type 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 to this section being **14 marks**.

**Section-B:** This section will consist of short -answer type questions with answer to each question upto two pages in length. Nine questions will be set by the examiner and the candidates will be expected to attempt six questions. Each question will carry 6 marks; total weightage to the section being **36 marks**.

**Section-C:** This section 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 expected to attempt two questions. Each question will carry 15 marks; total weightage of the section being **30 marks**.

**Section-A**

1. Nature and meaning of Central Excise-Excise and Central Excise. Distinction between Central Excise duties and Customs, Sales Tax, Octroi Duty.  
Basic of Excise Duty- Specific duty, advalorem duty levy of slabs, compounded duty.  
Leviability on what duty is leviable and who is liable to discharge the duty liability.  
Kinds of excise duty-Basic, additional duty of excise, special duty.
2. Organisation of Central Excise in India–Administration and operational authorities.
3. Regulatory Framework–An overview of Central Excise and Sale Act, 1944;  
An overview of Central Excise Tariff Act 1985; Central Excise Rule, 1944.  
Important terms and definitions–Assessee, Assessable value, excisable goods, manufacture, manufacturer.
4. General procedure under Central Excise.
  - A) Registration for Central Excise–Purpose and procedure thereof, exemption from registration filling of declaration for claiming exemption, forms of application for registration and filling of the same.
  - B) Classification lists-filling and submission or classification lists and its approval, Form I– Classification lists of excisable goods provided.
  - C) Price lists when prior approval of price lists required, when submission of price lists not required; submission of price lists under Part I and Part VII. Valuation of excisable goods-Items included and excluded in the value.
  - D) Maintenance of production records–RG 1 Register of daily production; Stock register for Issue of raw materials under Form N RG 23 A (Part I) Account of raw material in Form No. 4.

**Section-B****Clearances****Type of Clearances**

Clearances of excisable goods under physical control, self-removal procedure, compounding scheme; clearance of nonexcisable goods; removal of goods for home consumption; removal of goods for exports.

## (i) Removal of goods for home consumption

(a) Clearance under physical control—marking an application under Form No. AR 1 to Circle Inspector before removal of goods.

Preparation of T R 6 and depositing of duty, removal of excisable goods; under GPI.

(b) Removal of goods under compounded levy scheme—Application for Exercise of this option.

(c) Self removal procedure—applicability and its salient features—Record based control and production based control.

Depositing of excise duty under challan TR 6.

Preparation of GP 1 and Maintenance of other records of removal like P.L.A., TG 23 A Part II Register.

(d) Clearance of non-excisable goods

## (ii) Removal of goods for exports

Export of excisable goods, excise concession in case of exports.

Type of exporters—Manufacturer exporter and merchant exporter.

Export of excisable goods under claim for rebate, export under bond and procedures thereof, Form No. A4 and A4A.

**Modvat**

What is MODVAT, salient features of MODVAT.

MODVAT declaration under Rule 57 G for claiming MODVAT under Rule 57 A.

**Small Scale Industry**

i) Eligibility of SSI which are exempted from licensing control.

ii) SSI availing concession rate of duty. General exemption in small scale exemption Scheme under Notification No 175/ 86/.

**Books of Accounts, Records and their Preservation—**

a) Records-RG I , EB-4 for daily production and clearance.

b) Account of Principal raw material-Form No. 4

c) MODVAT and Proforma Credit Record.

RG 23 A (Part I)

RG 23 A (Part II)

d) Personal Ledger Account

e) Goods received for reprocessing-Form No. 5

f) Excise Control Code No.

**Return**

RT-5 Periodical/Quarterly Return of material used

RT-11 For obtaining excisable goods for special industrial purposes without payment of whole or part of the duty and state the nature and quantity of such goods used for finalised products.

RT-12 Monthly return under S.R.P.

**Reference Books:**

1. Darey V.S. (2006 Tax mann's indirect Taxes Law Practice Taxmann. Publications Pvt. Ltd., New Delhi.
2. Taxmann's indriect Tax Laws as amended by Finance act 2007. Taxmann Allied Service Pvt. Ltd., New Delhi, 2004.
3. [www.incometaxindia.govt.in/](http://www.incometaxindia.govt.in/)

**Tax Procedures and Practice**  
**Paper-B**  
**Customs–Procedure & Practice**

**Time: 3 Hours**

**Total Marks: 100**  
**Theory Marks: 80**  
**Int. Ass. Marks: 20**

**Note:** 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 answers to each question up to five lines in length. All questions will be compulsory. Each question will carry two marks; total weightage to this section being **14 marks**.

**Section-B:** This section will consist of short answer questions with answer to each question upto two pages in length. Nine questions will be set by the examiner and the candidates will be expected to attempt six questions. Each question will carry 6 marks; total weightage to the section being **36 marks**.

**Section-C:** This section 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 expected to attempt two questions. Each question will carry 15 marks; total weightage of the section being **30 marks**.

**Section-A**

1. Role of Customs in International Trade.
2. Organisation of customs in India-Administrative and Operational Authorities.
3. Regulatory framework-An overview of customs Act, 1962; An overview of Customs Tariff Act, 1975.

**Important terms and Definitions**

Assessable value baggage, bill of entry, bill of exports, suitable goods, duty, exporter, foreign going vessel, aircraft goods, import, import manifest, importer, prohibited goods, shopping bill, stores, bill, stores bill of landing, export manifest, DOB, FAS, CIF, GATT, Letter of Credit.

4. Kinds of duties-basic, Auxiliary, additional or countervailing; basis of levy-advalorem, specified duties.
5. Prohibition of exportation and importation of goods and provisions regarding notified and specific goods.
6. Import of goods-free import and restricted import; Types of restricted import-prohibited goods, canalised goods, import against licensing; Types of import-import of cargo, import of personal baggage, import of stores;  
 Import of cargo- (a) import by land, sea or air route  
 (b) by post

Clearance procedure - For home consumption, for warehousing exbond clearance;

Steps and documents to be prepared and filed, viz. bill of entry-

-Form No. 22 bill of entry for home consumption

-Form No. 23 bill of entry for warehouse.

-Form No. 24- Shipping bill for exbond clearance for home consumption and other accompanying document.

Clearance procedure for Import by post.

Clearance of baggage-Import of baggage-meaning and kinds of baggage; rules and procedure of import thereof general passenger, tourist passenger and transfer of residence passenger; (Form No. 37-Form for baggage declaration).

7. Export of Goods–Free Export and Restricted Exports; Types of Restricted Exports-Prohibited Exports, Canalized Exports, Exports Against Licensing; Types of Exports–Export of cargo; Export of Baggage; Types of Exporters-Manufacturer Exporter and Merchant Exporter;  
 Export of Cargo- (a) By Land, Sea and Air Route  
 (b) By Post

**Section-B**

Clearance Procedure - Procedure and Filling & Filing of Relevant Documents.

Form No.94- Shipping Bill for Export of Suitable Goods.

Form No.95- Shipping Bill for Export of Duty Free Goods.

Form No.96- Shipping Bill for Export of Duty Free Goods Exbond.

Form No.98- Bill for Export of Dutyable Goods.

Form No.99- Bill for Export of Duty Free Goods.

Form No.100-Bill for Export for Export of duty free goods ex-bond.

Duty drawback - Meaning/Scheme, procedure and documentation thereof.

Form No.93- Shipping Bill for Export of Goods under claim for duty Drawback.

Form No.97- Bill of Export for Export of Goods under claim for Duty dRawback.

**References:**

1. Darey 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 Service Pvt. Ltd., New Delhi, 2004.
3. [www.incomtaxindia.govt.in](http://www.incomtaxindia.govt.in).

### Advertising, Sales Promotion and Sales Management

| Year     | Paper                                | Periods per week |   | Ext. | Marks |    |
|----------|--------------------------------------|------------------|---|------|-------|----|
|          |                                      | L                | T |      | Int.  |    |
| 3rd year | <b>Paper-A:</b>                      |                  |   |      |       |    |
|          | Management of the Sales Force        | 3                | 3 | 80   |       | 20 |
|          | <b>Paper-B:</b>                      |                  |   |      |       |    |
|          | Sales Promotion and Public Relations | 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 1st year and 3rd year shall be prepared by every student and must be submitted in the college concerned upto July, 15. 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 college concerned.

## **Advertising, Sales Promotion and Sales Management**

### **Paper - A**

### **Management of the Sales Force**

**Time: 3 Hours**

**Total Marks: 100**

**Theory Marks: 80**

**Practical Marks: 20**

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 type questions with answers 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 type questions with answers to each question upto two pages. Nine questions will be set by the examiner and the candidates will be expected to attempt six questions. 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 answer 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 the sales force and its management.
- Functions of Sales Manager.
- Recruitment and Selection.
- Training and Direction.
- Motivation and Compensation.
- Appraisal of Performance

#### **Part-B**

- Sales force size, organisation of the sales department: Geographic, Product Wise, Market based.
- Sales Planning and Control: Market analysis and Sales forecasting. Methods of forecasting sales.
- Sales Budget: Importance, Process of sales budget, uses of sales budget.
- Sales territory: Considerations in allocation of sales territory.
- Sales quota: Objectives, principles of selling sales quota administration of sales quota. Uses of Sales quota.
- Sales and cost analysis: Uses and Methods.

#### **Suggested Readings:**

1. Johnston, Mark W. & Greg W. Marshall, Sales Force Management, McGraw Hill, 2008. (Richard D. Irwin).
2. Kotler, Philip, K.L. Keller, Abraham Koshy & Mithileshwar- Jha, Marketing Management PHI, 13th ed., 2007.



## **Advertising, Sales Promotion and Sales Management**

### **Paper - B**

### **Sales Promotion and Public Relations**

**Time: 3 Hours**

**Total Marks: 100**

**Theory Marks: 80**

**Practical Marks: 20**

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 type questions with answers 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 type questions with answers to each question upto two pages. Nine questions will be set by the examiner and the candidates will be expected to attempt six questions. Each question will carry six marks; total weightage of the section being **36 marks**.

**Section-C:** This section will consist to essay type questions with answer 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**

- Nature and Importance of sales promotion its role in Marketing, Forms of sales promotion: Consumer oriented sales promotion, Trade - oriented sales promotion and sales force oriented sales promotion.
- Major tools of sales promotion: Samples point of purchase, displays and demonstrations. Exhibitions and Fashion shows, sales contests and games of chance and skill, lotteries, gifts, offers, premium and free goods. Princepacks, rebates, patronage, rewards.
- Conventions, conference and tradeshows, specialities and novelties.

#### **Part-II**

- Developing and sales promotion programmes, pre-testing implementing, evaluating the results and making necessary modifications.
- Public relations: Meaning, features, growing importance, role in marketing, similarities of publicity and public relations.
- Major tools of public relations: News, speeches, special events, handouts and leaflets, audio-visual, public service activities miscellaneous tools.
- Ethical and local aspects of sales promotion and public relations.

#### **Suggested Readings:**

1. Kotler, P., K.L. Killer, A. Koshy & M. Jha, Marketing Management, 13th Ed., PHI, 2007.
2. Vaswar Das Gupta, Sales Management: In the Indian Perspective, PHI, 2004.

## Tourism and Hotel Management

### Paper-A

**Time: 3 Hours.**

**Total Marks: 100**

**Theory Marks: 60**

**Internal Assessment Marks: 20**

**On the Job Training Marks: 20**

#### **Instructions for the Paper Setter:**

**Note:** The question paper covering the entire course shall be divided into three sections as follows:

**Section-A:** It will consist of 8 very short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry 1½ marks; the total weightage being **12 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 8 will be attempted by the candidate. Each question will carry 3 marks; the total weightage of this section will be **24 marks.**

**Section-C:** It will consist of essay type question with answers to each question upto five pages in length. 4 questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry 12 marks; the total weightage of this section will be **24 marks.**

### Part-I

#### **Front Office**

- I. Front office as an operational department.
- II. Job description of front office assistant.
- III. Lobby:
  - Duties & responsibilities of lobby manager.
  - Organization of bell desk and functions.
  - Left luggage handling.
  - Guest errand cards.
  - Mail Message handling.
  - Wake up call procedure.
- IV. Check in-Check out procedure, Guest folio, safety locker management.
- V. Processing housekeeping discrepancy.

#### **Housekeeping**

- I. Housekeeping department-recruitment & selection.
- II. Floor linen room
  - Type of linen and use.
  - Par stock, safety stock, lead time quantity, Max. Qty, Min. Qty.
  - Inventory control.
  - Exchange of linen and uniforms.
- III. Interior Decoration, color, furniture, fixture and lighting in hotel.
- IV. Laundry Service.
- V. Housekeeping Practice.
  - Lost & found procedure.
  - Pest control.
  - Turn down service.
  - Key Control.

**Part-II****Food and Beverage Production:**

- I. Work Method in food preparation.
- II. Different type of soups.
- III. Curry powder used in Indian Cookery:
  - Gram masala, Pulao masala, Sambar masala, Rasam powder, Chaat masala, Meat masala.
- IV. Vegetables and salads.
- V. Meat (lamb, beef, pork) Poultry.
- VI. Basic Indian Gravies :
  - Yellow gravy.
  - White gravy.
  - Butter gravy.
  - Onion tomato masala.

**Food and Beverage Service:**

- I. Organization structure of F & B Service Deptt.
- II. Preparation for Service:
  - Mise-en-essance
  - Mise-en-place
  - Side board
- III. Type of Services:
  - English service.
  - French service.
  - Russian service.
  - American service.
  - Room service.
  - Geuridon service.
- IV. Briefing and check point for supervisor.
- V. Beverages (alcoholic, Non-alcoholic)
  - Procedure for serving table wine.
- VI. Cheese

**Students has to go for two months of specialized industrial training in a travel agency or in a hotel.**

**Specialized Industrial Training of 8 weeks**

The final year students are supposed to undertake practical training either in a hotel or a travel agency for at least two month. The project report will be submitted to college before examination and will be evaluated by external examiner.

The internal assessment shall be based on periodical tests, written assignment and behaviour in the class.

**Suggested Readings:**

- 1 Andrew Sudhir, *Food and Beverage Service*, Tata McGraw Hill Publications, New Delhi, 38th Edition, 1991.
- 2 Andrew Sudhir, *Front Office Training Manual*, Tata McGraw Hill Publications, New Delhi.
- 3 Koontz, H. *Wandrich Essentials of Management*, Tata McGraw Hill, Publishers, New Delhi, 1990.
- 4 Sudhir Andrew, *Hotel House Keeping*, Tata McGraw Hill Publishing Co. Ltd.
- 5 Negi Jagmohan *Hotels for Tourism Development*, Metropolitan, New Delhi, 2nd Edition, 1997.
- 6 Arora, Krishna, *Victory of Cookery*, Frank Bros. & Co. Publishers Ltd.

## Tourism and Hotel Management Paper-B

**Time: 3 Hours.**

**Total Marks: 100**  
**Theory Marks: 60**  
**Internal Assessment Marks: 20**  
**On the Job Training Marks: 20**

**Instructions for the Paper Setter:**

**Note:** The question paper covering the entire course shall be divided into three sections as follows:

**Section-A:** It will consist of 8 very short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry 1½ marks; the total weightage being **12 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 8 will be attempted by the candidate. Each question will carry 3 marks; the total weightage of this section will be **24 marks.**

**Section-C:** It will consist of essay type question with answers to each question upto five pages in length. 4 questions will be set by the examiner and the candidates will be required to attempt two. Each question will carry 12 marks; the total weightage of this section will be **24 marks.**

### Part-I

- I. Interdisciplinary approach of tourism, infrastructure and superstructure for tourism-special emphasis on Indian hospitality industry.
- II. Tourism planning and development, demand and supply in tourism.
- III. Tourism master plan.
- IV. Destination development and destination marketing.

### Part-II

- V. Economic, Social and Political consideration of tourism.
- VI. International tourism organization:
  - W.T.O.
  - PATA
  - IATA
- VII. Tourism in 21st century. Impact of globalization and the era of information technology and other future trend in tourism industry.
- VIII. Tourism pollution.

**Students has to go for two months of specialized industrial training in a travel agency or in a hotel.**

**Specialized industrial training of 8 weeks**

The final year students are supposed to undertake practical training either in a hotel or a travel agency for at least two months. The project report will be submitted to college before examination and will be evaluated by external examiner. The internal assessment shall be based on periodical tests, written assignment and behaviour in the class.

**Reference Books:**

1. Romila Chawla: Tourism in 21st Century, edition 2003, Sonali Publication.
2. Romila Chawla: Global Tourism, edition 2003, Sonali Publication.
3. Dalip Makan: Strategies & Planning in Tourism Industry, edition 2003, Adhyayan Publisher.
4. R.L. Varshney: International Marketing Management, edition 2005, Sultan Chand & Sons.
5. Romila: Tourism Research & Development, edition 2004, Sonali Publication.
6. Romila Chawla: Tourism Marketing & Development, edition 2004, Sonali Publication.
7. Romila Chawla: Economics of Tourism & Development, edition 2004, Sonali Publication.
8. Gene Burte & Munish Thakur: Management Today Principal & Practice, edition 1995, Tata McGraw Hill Publishing Co. Ltd.
9. Dr. C.B. Gupta & Dr. N. Rajan: Marketing Management, 7th edition 2002, Sultan Chand & Sons.

**Food Science & Quality Control  
(Vocational)**

FSQC-9

Food Analysis Centre

Time: 3 Hours

Marks: 75

**Instructions for the Paper-Setters:**

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

**Part-I**

1. Food Composition and factors effecting Food Composition.
2. Sampling techniques and preparation of sample.
3. General Physical methods of analysis of foods.
  - a) Electronic determination.
  - b) Refractrometry.
  - c) Polarimetry and polarography.
  - d) Food rheology.
  - e) Viscosity.
  - f) Surface tension.
  - g) Freezing point.

**Part-II**

General Chemical–Methods of analysis of food

- (a) Proximate composition.

Specific gravity

Ash and types.

Total protein, None protein and specific protein in foods, total fat and different types of lipids.

- a) Macro nutrients.
  - i) Sodium, K.P. Ca, Mg, Fe, Zn.
  - ii) Vitamins
  - iii) Trace Elements

**Reference Books:**

1. Manuals of Food Quality control additions contaminants techniques, 1980.
2. The Chemical Analysis of Foods and Food Products. By Morries B Jacob, 3rd Ed., Roberte, Krieger.

**Food Science & Quality Control  
(Vocational)****FSQC-10****Food Plant Layout & Management****Time: 3 Hours****Marks: 75****Instructions for the Paper Setters:**

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

**Part-I**

Importance of a plant layout selection of site and layouts of different food industries, selection of equipment, machinery and building material, selection and planning of manufacturing process and service facilities, maintenance and replacement, depreciation of machinery, management set up in a plant.

**Part-II**

1. Market and Consumer Research, Needs and types of Foods consumption trends. Economics; Psychological, Anthropological and Sociological dimensions of food consumption pattern.
2. Trends in social change and its role in diet pattern. Using social trends as a framework in new product innovation.
3. Food situation in India and outside. Trapping the unconventional post-harvest losses and prospects for food processing for expert.
4. Traditional foods-Status and need for revival in the context of westernized non-traditional foods, urbanisation and such factors.
5. Product Development: Primary Processing, Secondary Processing, Types of products e.g. Quick cooking, fast foods, fabricated food, convenience foods.

**Recommended Books:**

1. Principle of Food Sanitation by Marriott, 5th ed., 2006, CBS Publishers, New Delhi.
2. Food Processing Waste Management by Green JH and Kramer A, 1979, AVI Publishers, USA.
3. Food Science by Potter NN., 5th ed., 2006, CBS Publishers, New Delhi.

**FSQC-11****Food Analysis  
(Practical)****Marks: 25****Practicals**

1. (a) Lactometric determination  
(b) Refractometry  
(c) Polarimetry and polarography  
(d) Food Rheology  
(e) Viscosity  
(f) Surface tension  
(g) Freezing point.
2. Proximate composition of food using various techniques.
3. Estimation of different minerals in food using various methods.
4. Estimation of vitamins in food using analytical and microbiological techniques.
5. Estimation of crude, dietary and other fibre components.

**FSQC-12****Food Plant Layout & Management****Marks: 25****Practicals**

1. Calculation of depreciation of machinery and processing costs.
2. Determination of B.O.D./COD.
3. Preparation of layout and process diagram of potato crisp manufacturing plant.
4. Preparation of layout and process diagram of Jam/Marmalade manufacturing plant.
5. Preparation of layout and process diagram of Bread making plant.
6. Preparation of layout and process diagram of a dairy industry.
7. Preparation of layout and process diagram of wine making unit.
8. Preparation of layout and process diagram of a modern slaughter house.
9. Preparation of layout and process diagram of a confectionary unit.
10. Determination of sanitary status of plant equipment.
11. Visit to various food industries.



**Information Technology (Vocational)**  
**Paper-A**  
**Operating System**

**Time: 3 Hours**

**Total Marks: 100**  
**Theory Marks: 75**  
**Practical Marks: 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 maximum marks for the paper will be 75.
- iii. As far as possible except in the computer language papers no programme may be asked in the Theory papers. Emphasis should be on algorithm development.

Operating System Definition, Evolution of OS, Components of OS, Single User Operating System, Multi User Operating Systems (UNIX), Types of Processing (Batch Processing, Multiprocessing, Time Sharing, Real Time Processing (Hard Real Time Processing, Soft Real Time Processing), Multiprogrammed Batch Processing, Parallel Systems, Distributed Systems and Real Time Systems, Process Concept, Process Scheduling, Context Switching, CPU Scheduling: Basic Concepts, Scheduling algorithms.

Deadlocks: Deadlocks Characterization, Memory Management: Logical versus physical address space, paging, segmentation, Virtual memory, Demand Paging Technique.

File Management, File System Structure, Allocation Methods: Contiguous Allocation, Linked Allocation, Indexed Allocation, Free Space Management: Bit Vector, Linked List, Directory Implementation, Linear, List, Hash table, Device Management: Disk Structure, Disk Scheduling, FCFS, SSTF, SCAN, C-SCAN, LOOK

Windows NT Study as an Example of Operating System,

**Reference:**

Galvin and Sillberchatz, "Operating Systems" 7th Edition.

**Information Technology (Vocational)**  
**Paper-B**  
**Software Engineering**

**Time: 3 Hours**

**Total Marks: 100**  
**Theory Marks: 75**  
**Practical Marks: 25**

**Note for Paper Setters:**

- 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 equal marks.
- ii. The maximum marks for the paper will be 75.
- iii. As per as possible except in the Computer language papers no programme may be asked in theory, papers. Emphasis should be on algorithm development.

System Analysis, Data Modeling, Process Modeling, Network Modeling, Object Modeling, System Design and Construction.

Application architecture and process design, Database design, Input design and Prototyping output design and prototyping.

User interface design and prototyping, Software design, Object- Oriented design, System implementation and support, S/W testing.

**References:**

System Analysis and Design Methods by Jeffrey L. Whitten, 7<sup>th</sup> Edition, Tata McGraw-Hill.

Pankaj Jalote, "An Integrated Approach to Software Engineering", 3rd Edition.

**PRACTICAL**

Practical on the basis of Paper-A=25

Practical on the basis of Paper-B=25

**Electronics**  
**Paper-A**  
**Microprocessor Architecture and Programming**

**Time: 3 Hours****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 type 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 candidate 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**

Microprocessor, microprocessor instruction set and computer languages, microprocessor architecture and its operations, memory, input and output devices the 8085 MPU, example of an 8085-based microcomputer, memory interfacing.

**Unit-II**

Interfacing I/O devices, basic interfacing concepts, memory mapped I/O, comparison of Memory mapped I/O and peripheral I/O programming the 8085, introduction to assembly language, instruction classification, instruction format, how to write, assemble and execute a simple program.

**Unit-III**

Introduction to 8085 instructions, data transfer operations, arithmetic operations, logic operations, branch operations, and programming techniques: looping, counting, and indexing, additional data transfer and 16-bit arithmetic instructions, arithmetic operation related to memory, logic operations: compare, logic operation: rotate.

**Unit-IV**

Stack, subroutine, conditional call and return instructions, advanced subroutine concepts, BCD to binary conversion, binary to BCD conversion, BCD addition, introduction to advanced instruction and applications.

**Unit-V**

Interrupts of 8085, 8085 vectored interrupts, programmable data transfer, DMA data transfer and interrupt driven data transfer schemes. 8257 DMA controller, 8255, 8251, 8253, 8279, 8259. Introduction to 16 bits, 32 bits & 64 bits microprocessor s.a. 8086, 486, Pentium processor.

**Books:-**

1. Microprocessor Architecture and Programming by Gaonkar.
2. Fundamentals of Microprocessor & Microcomputers by B. Ram (Dhanpat Rai & Sons), 1990.
3. Microprocessors and Interfacing, DV Hall (TMH), 2<sup>nd</sup> Edition, 2006.
4. An Introduction to the INTEL, Family of Processor, JL Antonakos, Pearson Edu. Asia.

**Electronics**  
**Paper-B**  
**Electronic Communication Systems**

**Time: 3 Hours****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** 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** will consist of short-answer type 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** will consist of essay type questions. The examiner will set **four (4)** questions and the candidate 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**

Need for modulation, amplitude modulation, frequency spectrum of the AM wave, representation of AM wave, power relations in AM wave, generation of AM, grid modulated class C amplifier, plate modulated class C amplifier, single side band techniques, suppression of carrier, suppression of unwanted sideband the filter system the phase shift method, frequency modulation theory of frequency and phase modulation, description of systems, mathematical representation of FM frequency spectrum of the FM wave, phase modulation, inter system comparisons, generation of FM, direct method, stabilized reactance modulator-AFC, indirect method.

**Unit-II**

Radio receiver, receiver types, tuned radio frequency receiver, superheterodyne receiver, AM receivers, RF section and characteristics, Frequency changing and tracking, intermediate frequencies and IF amplifiers, detection and automatic gain control (AGC), FM receiver, comparison with AM receivers, amplitude limiting, basic FM demodulator, ratio detector, FM demodulator comparison.

**Unit-III**

Pulse communication, information theory, pulse modulation, introduction and its types, pulse width modulation, pulse position modulation pulse code modulation, digital communication, fundamentals of digital communications systems, the emergence of data communications systems, characteristics of data transmission circuits, digital codes, error detection and correction, modern classification, modern interfacing.

**Book:-** Communication Systems by Kennedy.

**References:**

1. Communication System by Kennedy (Tata McGraw Hill Publishing Company), 4th Edition, Reprint 2005.
2. Taub's Communication System Taub Schilling (Tata McGraw Hill, 2nd Edition, 2007).
3. Communication System, B.P. Lathi (Wiley Eastern Lim) 8<sup>th</sup> Edition, Reprint 2006.

**Electronics**  
**Paper-C**  
**Television System**

**Time: 3 Hours****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** will consist of short-answer type 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** will consist of essay type questions. The examiner will set **four (4)** questions and the candidate 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**

Elements of TV system, picture-Sound transmission and reception, synchronization, analysis and synthesis of TV Pictures, gross structure, image continuity, number of scanning lines, flicker, fine structure, tonal gradation, composite video signal, video signal dimensions.

**Unit-II**

Channel bandwidth, vestigial sideband transmission and reception of vestigial, sideband signals, monochrome picture tube, beam deflection, screen phosphore, face plate, picture tube characteristics, picture circuits controls, TV camera tubes, basic principle, image orthicon, vidicon, plumbicon.

**Unit-III**

TV receiver, types of TV receiver, receiver sections, vestigial side, band correction, choice of intermediate frequency, picture tube circuitry and controls sound signal separation, sound section, sync processing and AFC circuit, vertical deflection circuit, horizontal deflection circuit, TV antennas, preference of AM for picture signal transmission, TV transmission antennas, TV receiver antennas.

**Unit-IV**

Essential of colour television, compatability, three colour theory, luminance, hue, saturation, colour TV camera tube, the luminance signal, values of luminance and colour difference signals, Polarity of colour difference signals, colour TV display tube, delta gun colour picture tube, colour signal transmission, bandwidth for colour signal transmission, modulation of colour difference signals, weighting factors, formation of chrominance signal, NTSC colour TV system, NTSC colour receiver, limitations of NTSC, system PAL colour television system, remote control, electromechanical control system, electronic control system. Basic Concepts of liquid crystal display and plasma TV, introduction to high definition TV.

**Books:-**

1. Monochrome and Colour TV by R.R. Gulati (New Age International), Reprint 2007.
2. Television Engineering by Arvind Dhake (TMH)
3. Colour Television Theory by S.P. Bali (TMH), 2000.

**Electronics**  
**Paper-C (Practicals)****Time: 3 Hours 30 min.****Marks: 50**

- Note:**
1. Perform ONE experiment from Section-A
  2. Demonstrate the project from Section-B
  3. Minimum Hours per week for practicals-6

**Section-A**

1. To study the amplitude modulation and demodulation experimental boards.
2. To study the frequency modulation and demodulation experiment boards.
3. To study the function of a superheterodyne receiver.
4. To study the operation of balance modulator.
5. To study the PAM PWM, PPM techniques.
6. Simple programs for sorting a list number in ascending and descending order.
7. Sorting a list without destroying the original list.
8. Code conversion-Binary to Gray/Gray to Binary.
9. Program of addition of BCD numbers.
10. Program for multiplication of 8 bit numbers using Booth's algorithm.
11. Interface a LED array and 7-segment display through 8255 and display a specified bit pattern/character sequence at an interval of 2 seconds.
12. Write a program to demonstrate rolling display from left to right using 8279. Do not use any built in routines, instead program the 8279.
13. Use the SOD line to generate a square wave of the specified duty cycle at a given frequency.
14. To measure voltages, resistances and to observe waveform of sync detector circuit of a given television set.
15. To observe voltage, resistance, waveform of video amplifier circuits and to plot its frequency response characteristics.
16. To observe voltage, resistance and waveforms of Picture I.F. amplifier, Sound I.F. amplifier and sound output stage of T.V. set.
17. To align the video I.F. Stage of T.V. receiver.

**Section-B**

Design at least TWO projects similar to the list mentioned below:

- a) Digital frequency meter
- b) Digital clock using 8085
- c) Digital voltmeter using 8085 microprocessor kit
- d) Super-heterodyne radio receiver
- e) Stereo amplifier
- f) Inverter output 400 W at 220/230 V.

**Computer Science****Scheme of Examination**

|  | <b>Time</b> | <b>Max. Marks</b> |
|--|-------------|-------------------|
| <b>Paper-A: Theory</b><br>Data Base Management System & Oracle | 3 Hours     | 75                |
| <b>Paper-B: Theory</b><br>Information Technology               | 3 Hours     | 75                |
| <b>Paper-C: Practical</b><br>Based on Paper-A                  |             | 25                |
| Based on Paper-B   |             | 25                |

**Note:** Practical Marks will include the appropriate weightage for proper maintenance of Lab record.

**Computer Science**  
**Paper-A**  
**Data Base Management System & Oracle**

**Time: 3 Hours**

**4 Hours per week**

**Total Marks: 100**  
**Theory Marks: 75**  
**Practical Marks: 25**

**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 far as possible except in the Computer language papers no programme may be asked in theory papers. Emphasis should be on algorithm development.

(iv) The students can use only Non Programmable and Non Programmable storage type calculator in the subjects/papers pertaining to computer.

**DBMS**

Introduction to database management system, components of DBMS, ER. Diagrams, Data Description Language, Data Manipulation Language, SQL.

Data Models, Hierarchical Model, Network Model and Relational Model, Relational Databases. Relational Algebra and Calculus Normalisation.

Database Security, Protection, Integrity, Recovery, Concurrency, Control, Decomposition.

Distributed Databases, Knowledge Base/Expert Systems and Object Oriented Databases.

**Oracle 10g**

**SQL \* PLUS**

Introduction to Oracle 10

SQL - DDL, DML, DCL.

Join methods & Sub query, Union, Intersection, Mipum, Tree Walking.

Built in Functions, View Security amongst users, Sequences, indexing object Features of Oracle 10.

**PL/SQL**

Introduction to PL/SQL.

Cursors - Implicit & Explicit.

Procedures, Functions & Packages.

Database Triggers.

**References:**

- 1 Desai B.C.: An Introduction to Database Systems, Galgotia Publishers.
- 2 Date C.J. An Introduction to Database Systems, Vol. I, Narosa Publishers.



**Computer Science**  
**Paper-B**  
**Information Technology**

**Time: 3 Hours**

**Total Marks: 100**  
**Theory Marks: 75**  
**Practical Marks: 25**

- Note:** (i) In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be equal marks.  
(ii) The maximum marks for the paper is 75.  
(iii) As per as possible except in the Computer language papers no programme may be asked in theory papers. Emphasis should be on algorithm development.

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

**Data & Network Communication**

Communication media: Twisted pair, Coaxial, Fibre optics, Wireless(Line of Sight & Satellite), Network Advantages, Types & Topologies, Communication using Network protocol/Network Interface card(NP/NIC), Transmission & Communication protocol/protocol(TCP/IP), Modems, Types of Operating systems: Multiuser, Multitasking & Multiprogramming and their examples.

**Information Systems**

Introduction to IT & its components, What is Information systems, Computer based information systems, Management Information System, Decision Support System, Expert System, Functional Information System, Open Information System, Transaction Processing System, System Development Process & System development Tools. Internet basics, Its uses and Applications.

**Fundamentals of Networking O.S.**

Introduction to components of various Networking O.S., Case Study of Network Operating System Windows NT.

**Fundamental of Client Server**

Basics of Client Server model and its applications. Designing a Client Server model by Creating Database Server and networking O.S. Server.

**Careers in Computers**

Role of Programmers, Program analysis, System Analyst, System Administrators, System Managers, System Integrators, DTP Manager & Administrators, MIS Director.

**References:**

- 1 Peter Norton, Introduction to Computers, Glencoe, Macmillan/McGraw Hill. Kroenke, Business Computer System, McGraw Hill.
- 2 Patric, G.Mckeown, Living with the Computers, 2nd edition, HBT Publishers, USA.
- 3 Hussain & Hussain, Computer Technology, Applications & Social Implications, PHI.

**Computer Application (Vocational)****Scheme**

|  |            |              |
|--|------------|--------------|
| <b>Paper-I: Internet and Web Designing</b> | <b>100</b> | <b>75+25</b> |
| <b>Paper-II: Business Data Processing</b>  | <b>100</b> | <b>75+25</b> |

**Paper-I**  
**Internet and Web Designing**

**Total Marks: 100**  
**Theory Marks: 75**  
**Practical Marks: 25**

**Theory: 4 Hours per week**

**Paper-A & B Practical: 2 hours per week (each paper)**

**Note for Paper Setter:-**

- 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 questions. All questions will carry equal marks.
- (ii) The maximum marks for the paper will be 75.
- (iii) As per as possible except in the Computer language papers no programme may be asked in theory papers. Emphasis should be on algorithm development.

1. BBS
2. Intro to Internet
3. E-Mail, Browsers
4. HTTP, WWW, Shell, TCP/IP-(PPP, SLIP)
5. FTP
6. HTML, Web Designing

**PRACTICAL**

**Marks: 25**

Database Concept by Korth:

–Simplified Approach to DBMS, Kalyani Publications.

–Oracle-Developer 200 by Ivan Bayross.

**Computer Application (Vocational)**  
**Paper-II**  
**Business Data Processing**

**Total: Marks: 100**  
**Theory Marks: 75**  
**Practical Marks: 25**

**Theory: 4 hours per week**

**Paper A & B Practical: 2 Hours per week (each paper)**

**Note for Paper Setter:-**

**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 questions. All questions will carry equal marks.  
(ii) The maximum marks for the paper will be 75.  
(iii) As per as possible except in the Computer language papers no programme may be asked in theory papers. Emphasis should be on algorithm development.

1. Introduction to Data Processing.
2. Need of Computers in Business.
3. Characteristics of Business Organization and Use of computers in various work areas of business.
  - a) Payroll System
  - b) Inventory Control
  - c) Online Reservation
  - d) Computer in Banks
  - e) Computer Application in Educational Institutions
4. Concept of Data Processing Methods with Examples.
  - a) Batch Processing
  - b) Online Systems
  - c) Time Sharing
  - d) Real Time Systems
  - e) Distributed Processing
5. File Organization.
  - a) Types of Files (Master, Transaction, Work, Backup, Audit Files)
  - b) File Organization (Serial, Sequential, Indexed Sequential, Direct Access Files).
6. Spreadsheets (Data Analysis Package)
  - a) Introduction to Spreadsheets
  - b) Lotus 123/MS Excel
  - c) Creating a simple worksheet
  - d) Computations in a Worksheet
  - e) Printing the Worksheet
  - f) Graphs
  - g) What if Analysis (Data sort, fill, query, filter)
7. Iterative controls
  - \* Simple Loops (Loop-end loop)
  - \* Numeric FOR Loops
  - \* While Loops
8. Intro and Advantages of procedures and functions with examples.
9. Intro to database Triggers
  - \* Creation a database trigger with example
  - \* Enable and disable of database trigger
  - \* Drop a database trigger
10. Developer 2000
  - \* Reports 6.0
  - \* Forms 6.0
11. Utilities
  - \* Export/Import
  - \* SQL \*Loader

**PRACTICAL**

**Marks: 25**

**Computer Maintenance (Vocational)**  
**Paper-A**  
**Networking Operating Systems**

**Time: 3 Hours**

**Total: Marks: 100**  
**Theory Marks: 75**  
**Practical Marks: 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 far as possible except in the computer language papers no programme may be asked in the Theory Paper, emphasis should be on algorithm development.**

Introduction of various Network Operating Systems (Windows 9x/XP/2000/NT)

Introduction to Windows 2003 server, Window 2003 features, Hardware requirements, planning the network, Windows 2003 network security model special purpose servers, licensing.

Planning storage strategies, options, working with disk administrator and backup.

Networking and Network protocols Configuration of Windows 2003.

Windows 2003 services Architecture and security Architecture, planning and managing group and user accounts File services, distributed file system, remote administration, remote access services, Internet & Intranet. Printing and supporting network clients, performance tuning.

Introduction to Windows NT, features, Hardware requirements. Windows NT services Architecture and security Architecture, planning and managing group and user accounts File services. Installation of Windows NT.

Concept of distributed Networks, E-mail & Internet Technology.

**Text & Reference Books:**

Windows NT 4 : The Complete Reference by Sybex Publisher, BPB 1999.

Inside Windows Server 2003: William Boswell Publisher, Pearson, 2003.

**Network Operating Systems Lab**

Installation of Windows NT.

Implementing LAN using workgroup model and windows 2003.

Implementing LAN using Windows 2003 Domain model.

Using user manager for Domains in Administration.

Assigning user rights and permission on different objects.

**Computer Maintenance**  
**(Vocational)**  
**Paper-B**  
**PROJECT**

**Total Marks: 100**

**General Instructions:**

1. A software module based on the work done in the entire course is to be developed.
2. The soft copy of the module shall be submitted to the College/Institute till January 31.
3. The software module shall be developed in groups, consisting of at most two students in a group.
4. The respective college shall depute guide(s)/supervisor(s) under whose supervision the software module shall be developed. The guide/supervisor shall clarify that the work done is original & authenticated. The certificate found to be incorrect at any stage shall attract the proceedings against all the stakeholders, as per the University rules.
5. The evaluation of the module shall be done by the following panel of examiners prior to the theory examination:
  - (a) Internal Examiner.
  - (b) External Examiner (to be appointed by the University, as is done in the practicals).
  - (c) Head, Department of Computer Science & Engineering, Guru Nanak Dev University, Amritsar or his/her nominee.

**Refrigeration and Air Conditioning**  
**(Vocational)**  
**Scheme of Examinations**

|                                  |                  |                               |
|----------------------------------|------------------|-------------------------------|
| <b>Paper-A: 50</b>               | <b>100 Marks</b> | <b>Theory Time: 3 Hrs</b>     |
| <b>Paper-B: 50</b>               |                  |                               |
| <b>Practical: 50</b>             | <b>100 Marks</b> | <b>Practical Time: 3 Hrs.</b> |
| <b>Practical Int. Asstt.: 50</b> |                  |                               |

**Note: Internal Assessment based on Practical**

**Practical Internal Assessment**

Hours for Teaching the subject:

**Theory: 6 Hours (per week)**

Hours for Teaching the subject:

**Practical: 6 Hours (per week)**

**Paper-A (Theory)**

**Time: 3 Hrs**

**Marks: 50**

**Instructions for the Paper Setters:**

(a) No question involving use of log table should be set in the paper.

(b) Psychrometric chart to be provided by the concerned college.

(c) This paper will consist of three sections and will be known as section A, B and C.

**Section-A:** There will be 10(ten) very short answers type question (four to five lines). All questions are compulsory. Each question will carry 1½ marks; total weightage of the section being **15 marks**.

**Section-B:** There will be eight questions. Out of these eight questions any five are to be attempted. Each question will carry three marks; total weightage of the section being **15 marks**.

**Section-C:** There will be four long type questions. Any two questions are to be attempted. Each question will carry 10 marks; total weightage of the section being **20 marks**.

1. **Steam Jet Refrigeration:-** Introduction, steam jet Refrigeration, Analysis of Steam Jet Refrigeration system, Components of Steam Jet Refrigeration Plant, Advantages and Limitation of steam jet Refrigeration System, Performance of the system.
2. **Non Conventional Refrigeration System:-** Thermoelectric Refrigeration, Vortex Tube Thermoelectric effects, Applications of Vortex Tube, Advantages of Vortex Tube, Refrigerant Mixture and its properties, Cooling by Adiabatic demagnetisation, plus Tube Refrigeration.
3. **Methods of defrosting:-** Necessity of Defrosting, Manual Defrosting, Automatic Periodic Defrosting, Water Defrosting, Defrosting by Reversing Cycle, Automatic Hot Gas Defrosting thermobank Defrosting, Electric Control Defrosting, Electric Air Switch Defrosting System, Two outdoor units system, Multiple evaporator defrosting.
4. **Electric Controls:-** Introduction, Water Level Control, High Pressure control, Low pressure control, Superheat control, Superheat and pressure limit control, over Protection control, Temperature Differential and Temperature Range control Capacity control Devices.
5. **Solar Heating and Cooling:-** Introduction Solar Collectors Solar Refrigeration, Solar Air conditioning, Solar Dehumidification, Solar Heat Pump System, Economics and future of Solar Energy.

**Refrigeration and Air Conditioning**  
**(Vocational)**  
**Paper-B (Theory)**

**Time: 3 Hours****Marks: 50****Instructions for the Paper setters:**

- (a) No question involving use of log table should be set in the paper.  
 (b) Psychrometric chart to be provided by the concerned college.  
 (c) This paper will consist of three sections and will be known as section A, B and C  
**Section-A:** There will be 10 (ten) very short answer type questions (four to five lines). All questions are compulsory. Each question will carry 1½ marks; total weightage of the section being **15 marks**.  
**Section-B:** There will be eight questions. Out of these eight questions any five are to be attempted. Each question will carry three marks; total weightage of the section being **15 marks**.  
**Section-C:** There will be four long type questions. Any two questions are to be attempted. Each question will carry 10 marks; total weightage of the section being **20 marks**.

1. **Ice Manufacture:-** Introduction, Principle of Ice Production, Different Methods of Ice manufacturing, Treatment of Water for making the Ice, Brines, Freezing Tanks, Ice cans, Quality of Ice, General layout of Ice factory.
2. **Food Preservation:-** Introduction, Factors contributing to food spoilage, Causes of Food Spoilage, methods of Food preservation, Freezing methods of Food preservation, Preservation of Foods with direct contract of liquid CO<sub>2</sub> Freeze Drying, Preservation of Different products, cold storage and commercial cabinets.
3. **Transport Air Conditioning:-** Introduction, Automobile Air-Conditioning, Railway Air conditioning, Marine Air-Conditioning, Air-Crafts, Air-Conditioning.
4. **Commercial Applications:-** Introduction, Air conditioning of houses and offices, Air conditioning of Hotels and Restaurants, Air conditioning of departmental stores, Air-Conditioning of Theatres and Auditorium, Air conditioning of Hospitals.
5. **Industrial and Special Applications:-** Introduction, Design considerations in Bus Air Conditioning, Air conditioning in textile industry, Medical applications, Engineering Applications, Air conditioning of Special Type Building, Ice Rinks.

**PRACTICAL****Time: 3 Hours****Marks: 50****List of Experiments**

1. Gas charging in a Refrigerating system and testing for leakages.
2. Gas charging in a Air conditioning system and testing for leakages.
3. To test and adjust low pressure out. (L.P.)
4. To test and adjust high pressure out. (H.P.)
5. To service Ice candy plant (small unit)
6. To study the cold storage and layout the cold storage.
7. To test overload and relay in window unit.
8. To test and adjust thermostat.
9. To find the C.O.P. of and Air conditioner.
10. To study Domestic Refrigerator.

**Automobile Maintenance  
(Vocational)  
Paper-A (Theory)**

**Time: 3 Hours****Marks: 100****Periods per week****Theory-6****Instructions for the Paper Setter:**

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

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

**Paper-A:** Theory shall consists of three parts:-

- (a) Ten short compulsory questions requiring short replies of five lines each. Each question carries **two marks**.
- (b) Ten questions of six marks each giving to the points replies. Eight questions carrying **forty eight marks** will be attempted by the candidates.
- (c) Two questions of descriptive type to be attempted by the candidate out of set of four questions.

**Total marks thirty two.**

The question paper should cover the whole syllabus.

**Part-I**

Object of transmission, Resistance, Variation of tractive efforts and total resistance with speed, Sliding mesh gearbox, Sliding mechanism, Constant mesh gearbox, Synchromesh gearbox, Simple epicyclic gear, Automobile epicyclic gearbox, General deduction, Mechanism of epicyclic gearbox, Pre-Selector Gearbox, Torque convertor, Free Wheel Unit overdriver, Gearbox troubleshooting, Transmission trouble diagnosis, Four wheel drive and transfer case operation and service, Drive lines and universal joints, Differential and drive axle.

**Part-II****Springs and Suspension Systems:**

Introduction, Objects of suspension, Rate and frequency, Basic requirements, Classification of suspension springs, Adjustable and self adjusting suspensions, Interconnected suspension systems, Independent front suspension, Independent rear suspension, Shock absorbers, Suspension systems troubleshooting.

**Fluid Fly Wheel:**

Introduction, Advantages & Disadvantages of Fluid Fly wheel.

**Brake System and Brake Services:-**

Introduction, Purpose of brakes, Requirement of brakes, Brake efficiency, Factor effecting to brakes, Braking forces, Classification of Brakes, Braking force, Classification of Brakes, Braking systems, Method of actuating brakes, Construction of actuating brakes, Construction of disk type brakes, Mechanical brakes, Coiling mechanical break, Hydraulic brakes, Bleeding of brakes, Hill holder, Electric brakes, Brake troubleshooting. Basic concepts of Anti lock braking system.

**Tyre and Wheels Construction and Service:-**

Wheel assembly, Wheels, Rims, Tyres, Types of tyres, Construction of a tyre, Tyre plies and construction, Tyre sizes, Tubes, Tyre inflation pressure, Schrader valve, Tyre inspection, Desirable tyre properties, Tyre chains, Care and maintance of rims, Tyres and tubes, Tyre rotation, Repair of inner tube, Repair of tyres, Wheels and tyre troubleshooting.

**Tune up and Workshop Setup:-**

Introduction, Tune up procedure of Engine, Fault finding and troubleshooting in petrol engine and diesel engine, to set up and Automobile workshop and service station, Ways to sell better service.

**References:**

1. Basic Automobile Engineering (Punjabi Edition) Written by C.P. Nankra. Published by Dhanpat Rai and Sons, Jalandhar, Delhi.
2. Royal Basic Automobile Engineering (Punjabi Edition) Written by R.K. Kalia.
3. Automobile Mechanics (English Edition) Written by William H. Crousa, Donald L. Anglin.



**Automobile Maintenance (Vocational)**  
**Paper-B**

**PRACTICAL**

**Time: 3 Hours**

**Periods Per Week**  
**Practical - 4**  
**Marks - 80**  
**Int.Ass. Marks - 20**  
**Total Marks - 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                |
| Internal Assessment              | 20                |
|                                  | <b>Total: 100</b> |

**PRACTICAL**

1. Gear box dismentling and Assembling/Serviceing.
2. Drive shoft and universal/Joint opening.
3. Steering wheel/Droparm, Tie rod opening.
4. Front wheel alignment.
5. Foot Brake Leather opening and fitting.
6. Brake Adjustment.
7. Tie rod opening and fitting.

**B.Sc. Geography (Geophysics)**  
**Paper-A: Geophysics-I**  
**(Geophysical Methods)**

**Marks: 70**

**Instructions for the Paper Setters:**

**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 unit (1-4). Seven questions are to be attempted. Each question will carry *two* marks.

**Section-A**

**Gravity Methods:**

Gravity of the Earth, Gravity Anomalies, Gravity Instruments, Measurements of Gravity, Gravity Field Surveys.

**Section-B**

**Magnetic Methods:**

Magnetism of the Earth, Field Instruments for Magnetic measurements, Magnetic Surveys, Field Examples.

**Section-C**

**Resistivity Methods:**

Resistivity of Rocks and Minerals, Fundamentals of the current flow in the Earth, Electrode arrangement and field procedures, Resistivity Survey Instruments and Field Procedure.

**Section-D**

**Seismic & Radiometric Method:**

Methods of Seismic Prospecting viz. the reflection and refraction methods. Basis of radiometric prospection. Radiometric Surveys viz Air borne, Automobile and foot Surveys, Radiometers, Role of radiometry in Geophysical prospecting. Analysis of Uranium Thorium and Potassium in ores and rocks.

**References:**

1. Geophysical Methods in Geology by P.V. Sharma. Elsevier Science Publishing Company, New York.
2. Applied Geophysics by W.M. Telford, L.P. Geldart, R.E. Sheriff and D.A Keys. Cambridge University Press Cambridge, New York.
3. Principles and Method of Nuclear Geophysics by Bhimasankaram. Venkat Rao, Srirama Murti and Savenko Published by Association of Exploration Geophysicists, Center of Exploration Geophysics, and Osmania University Hyderabad, India.
4. Principles and Method of Nuclear Geophysics by Bhimasankaram. Venkat Rao, Srirama Murti and Savenko Published by Association of Exploration Geophysicists, Center of Exploration Geophysics, and Osmania University Hyderabad, India.
5. Radiometric Methods of Exploration by VLS Bhimasankaram.
6. Radiation Detectors Measurements by G.F. Knoll.

**B.Sc. Geography**  
**Paper-B**  
**Geophysics-II**  
**(Nuclear Geophysics)**

**Max. Marks: 70**

**Instructions for the Paper Setters:**

**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 unit (1-4). Seven questions are to be attempted. Each question will carry *two* marks.

**Section-A**

**Basic Concepts about the Atom and the Nucleus:**

Nuclear size and measurements, Nuclear properties, Radioactive disintegration, Radioactive series and Equilibrium, Nuclear reactions, Artificial Radioactivity, Units of Radioactivity.

**Section-B**

**Interaction of Radiation with matter:**

Interaction of charged particle with matter, Stopping power, Energy loss of a heavy charged particle in matter, Interaction of gamma rays with matter, Photoelectric effect, Compton effect and Pair Production process.

**Section-C**

**Radiation Sources and Detectors:**

Alpha Radiation Sources, Beta Radiation Sources, Gamma Radiation Sources, Isotopic X-ray sources, Neutron Sources, Radiation Detectors viz. Ionisation Chamber, Proportional counter, Geiger Muller Counter, Scintillation Detectors, Semiconductor Detectors and Neutron Detectors.

**Section-D**

**Radioactivity of Rocks and Ores:**

Radioactivity of igneous rocks, Radioactivity of sedimentary rocks, Radioactivity of Soil, Radioactivity of air, Radioactivity of water, Radioactive Minerals and Ores, Uranium and Thorium occurrence in India.

**References:**

1. Geophysical Methods in Geology by P.V. Sharma. Elsevier Science Publishing Company, New York.
2. Applied Geophysics by W.M. Telford, L.P. Geldart, R.E. Sheriff and D.A Keys. Cambridge University Press Cambridge, New York.
3. Principles and Method of Nuclear Geophysics by Bhimasankaram. Venkat Rao, Srirama Murti and Savenko Published by Association of Exploration Geophysicists, Center of Exploration Geophysics, and Osmania University Hyderabad, India.
4. Principal and Methods of Nuclear Geophysics by Bhimasankaram, Venkat Rao, Sriramamurti and Savenko. Published by Association of Exploration Geophysicists, Center of Exploration Geophysics, and Osmania University Hyderabad, India.
5. Radiometric Methods of Exploration by VLS Bhimasankaram.
6. Radiation Detectors Measurements by G.F. Knoll.

**Paper-C****PRACTICAL****Max. Marks: 60****Lab Practical:**

1. To find the operating voltage of a Geiger Muller Counter.
2. To find the value of absorption coefficient of beta particles for aluminium.
3. Use of LR-115 plastic track detector for radon measurement in soil.
4. Gamma ray survey using scintillometry. (30 Marks)

**Field Training:**

The students will have to carry out field training with ONGC or some other agency involved in Geophysical prospecting and will prepare the report. (30 Marks).

**Home Science****Scheme of Examination**

| <b>Sr.</b> | <b>Name of Paper</b>                           | <b>No. of<br/>Papers</b> | <b>Time<br/>in Hrs.</b> | <b>Marks</b> | <b>Int.<br/>Ass.</b> | <b>Period/Week</b> |
|------------|--|--------------------------|-------------------------|--------------|----------------------|--------------------|
| 1.         | Foods & Nutrition<br>(Theory-A)                | I                        | 3 Hrs.                  | 65           | 10                   | 4/week             |
| 2.         | Foods & Nutrition                              | 1                        | 3 Hrs.                  | 40           | 10                   | 6 group/week       |
| 3.         | Child Development<br>(Theory-B)<br>(Practical) | II                       | 3 Hrs.                  | 65           | 10                   | 4/week             |

**Home Science**  
**Foods and Nutrition**  
**Paper-A (Theory)**

**Total Marks: 75**  
**Theory Marks: 65**  
**Int. Ass. Marks: 10**

**Periods: 3 hrs/week**

**Instructions for 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 sections of the syllabus and will carry 13 marks each. Section E will consist of very short type questions covering the entire syllabus uniformly and will carry 13 marks.

**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. Importance and functions of food:
  - a) Physiological
  - b) Psychological
  - c) Social
2. Essential food Constituents: Carbohydrates, Proteins and fats; functions, sources, requirements and deficiency and excess.
3. Methods of cooking: Boiling, steaming, frying, baking, roasting and micro-wave cooking.

**Section-B**

4. Food nutrients : Functions, recommended allowances, deficiency excess and sources of the following nutrients:
  - a) Vitamins–A, B, B<sub>2</sub>, Niacin, C, D
  - b) Minerals–Calcium, Phos, Iron, Sodium, Iodine
5. Food Preservation: Definition, Importance & Principles. Causes of food spoilage. Household methods of preservation. Sun drying, use of salt, oil, spices, sugar & chemical preservatives.

**Section-C**

6. Food Adulteration:
  - i) Definition
  - ii) Common Adulteration
  - iii) Food standards
7. Concept of balanced diet.
8. Classification of food based on the five/seven food groups.
9. Principles of Meal planning.
  - a) Planning of balanced diets for the middle income group for the following:
    - i) Pre-school children
    - ii) School going
    - iii) Adolescents
    - iv) Adult-male and female (only moderate worker)
    - v) Old age
    - vi) Pregnancy
    - vii) Lactation

**Section-D**

10. Therapeutic diets & modification of normal diets :
  - a) Principles of therapeutic diets
  - b) Concept of soft, bland, liquid diets with examples.
11. Therapeutic diets in the following conditions with principles involved:
  - a) Fever
  - b) Constipation
  - c) Diarrhea
  - d) High blood pressure/hypertention
  - e) Diabetes mellitus

**List of Equipments for a practical group of 15 students**

|                                 |          |
|---------------------------------|----------|
| 1. Gas burners                  | 15       |
| 2. Cooking Range                | 01       |
| 3. Ovens                        | 05       |
| 4. Mixes and grinders           | 05       |
| 5. Weighting Scales (for food)  | 05       |
| 6. Gas lighters                 | 15       |
| 7. Dustbin-small                | 15-Big-1 |
| 8. Vegetable racks              | 02       |
| 9. Plate racks                  | 15       |
| 10. Storage Jars and Containers |          |
| 11. Refrigerator                | 01       |
| 12. Leing sets                  | 05       |

**Cooking Utensils**

|                         |         |
|-------------------------|---------|
| 1. Pressure Cooker      | 15 size |
| 2. Patila with lid      | 30      |
| 3. Kadahai              | 15      |
| 4. Parat                | 15      |
| 5. Tawa                 | 15      |
| 6. Chakla-Belna         | 15      |
| 7. Grinding stone       | 15      |
| 8. Sauce pans           | 15      |
| 9. Karachhi             | 15      |
| 10. Palta               | 15      |
| 11. Poni                | 15      |
| 12. Soup strainers      | 15      |
| 13. Sieves              | 15      |
| 14. Enamel Bowls        | 15      |
| 15. Baking trays & tins | 15      |
| 16. Cookie trays        | 15      |
| 17. Serving trays       | 15      |
| 18. Cuting Knives       | 15      |
| 19. Peelers             | 15      |
| 20. Jelly moulds        | 15      |

**Crockery and Cutlery**

|                             |    |
|-----------------------------|----|
| 1. Full plates              | 30 |
| 2. Half plates              | 30 |
| 3. Quarter plates           | 30 |
| 4. Cups & Saucers           | 30 |
| 5. Soup bowls               | 30 |
| 6. Glasses                  | 36 |
| 7. Katoris vegetables bowls | 30 |
| 8. Dongas                   | 30 |
| 9. Forks                    | 30 |
| 10. Table Knives            | 30 |
| 11. Table spoons            | 48 |
| 12. Tea spoons              | 48 |
| 13. Serving spoons          | 24 |
| 14. Tea sets                | 05 |
| 15. Dinner sets             | 05 |
| 16. Borosil bowls           | 15 |
| 17. Casseroies              | 15 |

**List of Books:**

1. Applied Nutrition, R. Rajalakshmi, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Principles of Nutrition-Dietetics, Dr. M. Swaminathan, The Bangalore Printing and Publishing Co. Ltd., 88, Mysore Road, Bangalore.
3. Food & Nutrition, By Educational Planning Group, Arya Publishing House, Karol Bagh, New Delhi-5.
4. Normal and Therapeutic Nutrition, By Corinne H. Robinson, Marlya R. Lowler Macmillan Publishing Co., New York, Collier Macmillan Publishers, London.
5. Nutritive Value of Indian Foods:  
C. Copalen B.V.  
Rama Sastri S.C.  
Balasubramaniam  
National Institute of Nutrition, Indian Council of Medical Research, Hyderabad, India.



**Home Science**  
**Foods and Nutrition**  
**(Practical)**

**Time: 3 Hours**

**Total Marks: 50**

**Practical Marks: 40**

**Int. Ass. Marks: 10**

**Teaching: 6 Periods/week**

1. Preparation of minimum of three dishes by using various methods of cooking (e.g. boiling, steaming, baking), frying (deep & shallow) and roasting with different food groups e.g. cereal, pulses & vegetables groups and their combinations.
2. Planning & Preparation of diets for the following:
  - a) Pre-School child
  - b) School going/packed lunch
  - c) Adolescence
  - d) Adult (Man & Woman) moderate worker pregnancy and lactation diets.
3. Cooking and serving of the following: Invalid cookery: soft, liquid, fluid diets.
4. Hot and cold beverages (atleast two each)
5. Food preservation-Pickle, chutneys, jams, squashes, sherbets, sauce (at least two each).
6. Low calories recipe (five)
7. Low cost recipe (five)
8. Enhancing Nutritive value (five).

**Note:** It is recommended that practical exams, should be held before the theory exams.

**Home Science**  
**Paper-B**  
**Child Development**

**Time: 3 Hours**

**Total Marks: 75**  
**Theory Marks: 65**  
**Int. Ass. Marks: 10**

**Instructions for 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 sections of the syllabus and will carry 13 marks each. Section E will consist of very short type questions covering the entire syllabus uniformly and will carry 13 marks.

**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. Definition and importance of Child Development.
2. a) Differences between growth and development.  
b) Principles of development.
3. Physical development of the child from infancy to late childhood and factors affecting the same.

**Section-B**

4. Motor Development from infancy to late childhood Pattern of motor development. Factors affecting motor development.
5. Emotional Development Characteristics of children emotions. Common childhood emotions hear, anger, jealousy, love and affection, anxiety and curiosity.
6. Language Development Stages of language development Factors affecting language development

**Section-C**

7. Social Development Stages of social development  
Pattern of social development  
Role of family and school in the development of the child.
8. Play  
Significance of play  
Types of play  
Play materials/equipment required for various age group.
9. Common behaviour problems and their remedies–Bed etting, thumb sucking, nail biting, temper tantrums.

**Section-D**

10. Pregnancy
  - Signs and symptoms of pregnancy
  - Discomforts
  - Complications
  - Care during pregnancy
  - Methods of family planning in brief
11. Pre natal development stages of pre natal development
  - Factor affecting pre natal development
12. Feeding of the infant
  - Importance and technique of breast feeding
  - Bottle feeding
  - Weaning
  - Different kinds of important weaning foods for infants
  - Importance of weaning

**List of Books Recommended for Child Development**

1. Human Development, Graing J. Graig, Fifth edition, 1989, Prentice Hall, Englewood Cliffs, New Jersey, 07632.
2. The Modern Parents Guide to Baby and Child Care–Violet Broadribb, R.N.H.S.& Henry F, Loe, M.E. 1973, Macdonald's London.
3. Good House Keeping' Baby V Book–The Good Housekeeping, 12th ed., 1959.
4. These are your children–Dadys Gardner Jenkins and Helen Shacter, 4th ed. Scott. Foresman and Co. Glenview Illinios.
5. Hurlock, E.B. Child Development, 1978, 6th ed., McGraw Hill, International Book Company.

## Cosmetology (Theory)

**Time: 3 Hours**

**Marks: 75**

**Instructions for the Paper Setters:**

**Note:** Question paper will consist of three sections as follows:

**Section-A:** It will consist of 8 very short- answer questions with answers to a 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 question will be set by the examiner & seven will be attempted by the candidate. Each question will carry equal 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 quesitons will be set by the examiner & candidate will be required to attempt two. Each question will carry 12 marks. Total weightage being 24 marks.

### Scheme of Studies & Examination

| Name of Paper         | Periods/Week | Time   | Marks      |
|-----------------------|--------------|--------|------------|
| Paper-I (Theory)      | 4/Week       | 3 hrs. | 75         |
| Paper-II (Practical)  | 4/Week/Group | 3 hrs. | 50         |
| Paper-III (Practical) | 4/Week/Group | 3 hrs. | 50         |
| Job Training          |              |        | 25         |
| <b>Total:</b>         |              |        | <b>200</b> |

**Note :** 'On the Job training' of minimum 15 days in a reputed Beauty Saloon should be undertaken by each student & report should be submitted for the same.

**Cosmetology****Paper-I****(Theory)****Periods 4 Week****Marks: 75****1. Bacteriology**

How bacteria grow and reproduce, pathogenic and nonpathogenic bacteria, types of pathogenic bacteria, Infections and disease, Bodily defences, Viruses, Immunity, Fungi, Animal parasites, Auoliding illness.

**2. Sterlization and Sanitation**

Sterlization methods' chemical sanitizing methods, Sanitizers, general Sanitary suggestions, meeting health standards, how to Sanitise equipment.

**3. Salloon Management**

- a) Saloon Ownership–Kinds of ownership
- b) Saloon Planning–Selecting alocation, space allotment, installation on costs.
- c) Operating Cost–Cost of service.
- d) Record Keeping–Record Keeping for employees
- e) Book Keeping–Cash disbursement, finding book and bank balance.
- f) Types of Insurance for Beauty Saloons.
- g) Taxes and laws pertaining to beauty saloons–Income taxes, reporting tips.
- h) Retailing and Salesmanship, professional ethics : Relationships with your clients, co-workers, employer, employees.

**4. Electricity and the Beauty Saloon**

- a) Electricity and Electric Current
- b) Producing Electric Current
- c) Conductors and insulations
- d) Potential Hazards: Overloading and short circuits
- e) Safety devices: Fuses, circuits brackers, grounding
- f) Lighting of the Saloon

**5. Chemical Structure of Hair**

- a) Saloon Procedures that Breat hair bands–Chemical straightening, chemical waving, repairing broken bonds.
- b) Saloon Procedures that colour the Hair–Temporary colour, hair lighteners, permanent hair coloring.

**Cosmetology**  
**Paper-II**  
**(Practical)**

**Periods 4/Week**

**Marks: 50**

**1. Make Up:**

- a) Cosmetics used in makeup, How to choose the correct colors, selecting a foundation color, how to determine facial balance.
- b) **Types of Make up Applications:** Applying day time make, Bridal Make up.
- c) Correct Make up using optical illusions–Seven basic facial shapes, the key to successful make up application.
- d) Safety precautions, Patron precautions while applying make-up.
- e) Applying False Eye Lashes.

2. Hair Styling–Formal and Casual (Bridal, party, workplace), Buns, plaits and combination at least 5.

3. Draping of formal, Casual–Saree, Lehanga suits for different occasions.

**Cosmetology**  
**Paper-III**  
**(Practical)**

**Periods 4/Week**

**Marks: 50**

**1. Thermal Hairstyling**

- a) Equipment and supplies used in thermal styling. Blow drying, curly hair styles, heat lamps, hot rollers, curling irons.
- b) Hair pressing–Pressing and straightening.

**2. Wigs and Hairpieces**

- a) Wig materials
- b) Bases for Wigs and Hairpieces.
- c) Wig construction
- d) Types of Hair pieces, how to attach hair pieces
- e) How to clean and care for wigs and hair pieces

**3. Hair Coloring**

- a) Classification of hair coloring.
- b) Preparing for hair coloring–Preliminary consultation scalp and hair examination, color selection, patron protection, predisposition test, preliminary strand tests.
- c) Care of Hair coloring products.
- d) Safety precautions.
- e) Application of temporary hair color.
- f) Application of semi permanent hair color.
- g) Application of permanent hair color

**4. Streaking Procedures**

**Travel & Tourism****Scheme of Studies**

| Course Paper    | Paper                              | Total Marks |
|-----------------|------------------------------------|-------------|
| <b>Paper-A:</b> | <b>World Travel Geography</b>      | <b>100</b>  |
| <b>Paper-B:</b> | <b>Exploring Tourism in Punjab</b> | <b>100</b>  |
|                 | <b>Total:</b>                      | <b>200</b>  |

**Paper-A**  
**World Travel Geography**

**Time: 3 Hrs.****Marks: 100****Instructions for the Paper Setters:**

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. **(10x02=20 Marks)**

**Part-B:** The examiner will set 8 long questions, 2 questions from each section of 20 marks each. The candidate will have to attempt 4 questions out of 8 question. **(04x20=80 Marks)**

**Unit-I****Chapter 1. Fundamentals of Geography**

Importance of Geography in tourism,  
Climatic variations, climatic regions of world.

**Chapter 2. Study of Maps**

Longitude & latitude,  
International Date Line,  
Time variations and time difference.

**Unit-II****Chapter 3. Popular Destinations-1**

United States of America and Europe  
African Wildlife

**Chapter 4. Popular Destinations-2**

Islamic Middle East  
South East Asia and Australia

**Unit-III****Chapter 5. Seven Wonder of the World**

Great Pyramid of Giza, Hanging Gardens of Babylon,  
Statue of Zeus at Olympia, Temple of Artemis at  
Ephesus, Mausoleum of Maussollos at Halicarnassus,  
Colossus of Rhodes, Lighthouse of Alexandria.



**Chapter 6. Modern Wonders**

Great Wall of China, Petra (Jordan). Christ the Redeemer (Brazil), Machu Picchu (Peru), Chichen Itza (Mexico), Roman Colosseum (Italy), Taj Mahal (India).

**Unit-IV****Chapter 7. Globalisation and Tourism**

Globalisation and Tourism in India,  
Incredible India campaign

**Chapter 8. Heritage and Challenges to Growth of Tourism**

What is Heritage and why should it be conserved  
World Heritage Monuments of India  
Reasons for slow growth rate of Tourism in India.

**Suggested Readings:**

- \* Allchin, B. Allchin, F.R. et al. (1989) Conservation of Indian Heritage, Cosmo Publishers, New Delhi.
- \* Ashworth, G.T. (2000), The Tourist Historic City. Retrospect and Prospect of Managing the Heritage City, Pergamon, Oxford.
- \* Dixit, M. Tourism Products, Royal Publishers.
- \* Hall, CM and Page, SJ. The Geography of Tourism and Recreation, Routledge.
- \* New Inskeep, Edward, Tourism Planning: An Integrated and Sustainable Development Approach (1991) VNR, New York.
- \* Pearce, D.G. and Butler, R.W. Contemporary issues in tourism development, Routledge.  
UNESCO-IUCN (1992) Eds. Masterworks of Man and Nature, Pantoga, Australia.

**Travel & Tourism**  
**Paper B**  
**Exploring Tourism in Punjab**

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

**Instructions for the Paper Setters:**

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. **(10x02=20 Marks)**

**Part-B:** The examiner will set 8 long questions, 2 questions from each section of 20 marks each. The candidate will have to attempt 4 questions out of 8 questions. **(04x20=80 Marks)**

**Unit-I**

**Chapter 1. Understanding Geography of Punjab:**

Topography, river system, climate, flora and fauna,  
 Historical impact on the life of the people

**Chapter 2. Gardens, Wetlands and Wildlife**

Bara Dari Patiala, Aam Khas Bagh (Sirhind), Harike  
 werland, Chhatbir Zoological Park (Zirakpur), Kansal  
 Forset Reserve (Chandigarh)

**Unit-II**

**Chapter 3. Ancient Medieval Landscapes of Punjab**

Ropar as a Centre of Harappan Civilisation  
 Stupa at Sanghol  
 Golden Temple, Amritsar  
 Medieval Serais and Imperial Highways

**Chapter 4. Modern Landscapes of Punjab**

Amritsar of Ranjit Singh: Ram Bagh and Gobindgarh Fort  
 Kapurthala Place  
 Sheesh Mahal, Patiala  
 Chandigarh as a Modern City

**Unit-III**

**Chapter 5. Fairs and Festivals**

Sikh, Hindu and Muslim Religious Fairs-Diwali, Holla Mohalla (Anandpur Sahib), Dusshera, Lohri, Maghi Mela (Muktsar), Baisakhi at Damdama Sahib (Talwandi Sabo), Urs of Sheikh Mujaddid-Alif-Saani (Sirhind), Religious and Secular Centres-Golden Temple and Akal Takth (Amritsar), Anandpur Sahib (Takth Keshgarh Sahib), Durgiana Temple (Amritsar), Devi Talab (Jalandhar).

**Chapter 6. Museums and Memorials**

Archaeological Museums at Ropar, Government Museum and Art Gallery and City Museum (Chandigarh), Panaroma of Ranjit Singh (Amritsar), Art Gallery at Sheesh Mahal (Patiala), Hussainwala Memorial (Ferozepur), Retreat ceremony at Wagah (Amritsar), Desh Bhagat Yadgaar Hall (Jalandhar), Sikh Museum (Golden Temple, Amritsar), Science City (Kapurthala), Jalianwala Bagh Martyr's Memorial (Amritsar).

**Unit-IV****Chapter 7. Handicrafts and Handlooms**

Phulkari, Bagh, Shawla, *durees* (floor covering), *Jutties* and Blankets

**Chapter 8. Performing Arts**

Dance : Bhangra, Gidda, Malwai Gidda, Jhummer, Sammi.

Music-Folk and Classical

**Suggested Readings:**

- \* Anand, Mulk Raj, ed. 1981. *Maharaja Ranjit Singh as the Patron of Arts* (Mumbai: Marg Publications)
- \* Arshi, P.S. 1986. *Sikh Architecture* (Delhi: Intellectual Publishing House).
- \* Aryan, K.C. 1977, *Punjab Murals* (Delhi: Rekha Prakashan).
- \* Aryan, K.C. 1983, *Cultural Heritage of Punjab* (Delhi: Rekha Prakashan).
- \* Daljeet, 2004. *The Sikh Heritage: A Search for Totality* (Delhi: Prakash Books).
- \* Grewal, J.S. Social and cultural History of Punjab: Pre-historic, Ancient and Early Medieval (New Delhi: Manmohan)
- \* Kang, Kanwarjit Singh, 1985. *Wall Paintings of Punjab and Haryana* (Delhi: Atma Ram & Sons).
- \* Parihar, Subhash, 1985. *Mughal Monuments of Punjab and Haryana* (Delhi: Inter-India Publications).
- \* Randhawa, M.S. ed., 1960, *Punjab Punjabi* (Patiala: Languages Department, Punjab).
- \* Srivastava, S.P., 1991. *Art and Cultural Heritage of Patiala* (Delhi: Sundeep Prakashan).

**[www.punjabgovt.nic.in](http://www.punjabgovt.nic.in)**

[punjabtourism.gov.in](http://punjabtourism.gov.in)

[chandigarhtourism.gov.in](http://chandigarhtourism.gov.in)