

# PUNJABI UNIVERSITY PATIALA

ORDINANCES

AND

OUTLINES OF EXAMINATION

SYLLABI AND COURSES OF READING

FOR

FOUR YEAR INTEGRATED B.Sc. (Non-Medical)

B.Ed. DEGREE PROGRAMME

(SEMESTER SYSTEM)

REGULAR

FOR

2017-2018 EXAMINATIONS

**Note:** Punjabi University, Patiala reserve the right to amend Regulations, Scheme of Examination, Pass Criteria, Scheme of Studies and courses of study as and when it deems necessary. The Colleges of Education are required to strictly follow the syllabi prescribed by the University. No deviation is permissible.

Four Year Integrated B.Sc (Non-Medical) B.Ed. Degree

Programmes

Semester –II

Paper	Course Title	Marks		
		T	E	I
i	Education Policy and Planning in Contemporary India	100	70	30
II	School Management	50	35	15
iii	Punjabi (Compulsory)	100	75	25
iv	English (Compulsory)	100	75	25
v	Mechanics-II	40	30	10
vi	Vibrations and Waves -II	40	30	10
vii	Electricity and Magnetism-II	40	30	10
vii	Practicals (Physics)	30	22	08
ix	Inorganic Chemistry	35	26	09
x	Organic Chemistry	35	26	09
xi	Physical Chemistry	35	26	09
xii	Practicals (Chemistry)			
xiii	Algebra-I	50	36	14
xiv	Partial Differential Equation	50	36	14
xv	Analytical Geometry	50	36	14

# **B.Sc. (Non-Medical)**

## **SEMESTER – II**

### **PAPER-I:**

## **EDUCATIONAL POLICY AND PLANNING IN CONTEMPORARY INDIA**

### **(A) OBJECTIVES**

To enable the student teachers to:

- Understand the education policy and its determinants.
- Identify and apply various approaches of educational planning.
- Analyze the functioning of administrative bodies.
- Critically analyze recent education policies.

### **(B) SYLLABUS**

#### **SECTION-A**

- (i) Education Policy-meaning and policy determinants.
- (ii) Policy formulation: Role of MHRD, NCERT, NASSCOM
- (iii) Education Planning: concept, types and approaches, The current plan- mobilisation and allocation of funds for different levels of education.

#### **SECTION -B**

- (i) Policy recommendations regarding school -National Education Commission (1964-66)
- (ii) Policy recommendations regarding school education-NPE-1968,NPE-1986, POA-1992
- (iii) Policy recommendation regarding Vocationalisation of education : Kulandaiswamy Report(1988)
- (iv) National Knowledge Commission (2005): Policy recommendation
- (v) Birla Ambani report on privation of Higher education
- (vi) Skill Development Mission (2014)

#### **Activities (Any one of the following)**

- (i) Preparing budget estimate for an elementary school with 200 students, 6 teachers and 4 supporting staff.
- (ii) Study of mid-day meal practices in the school and suggestions for further improvement.
- (iii) Study of the availability of the text books and students school bag contents.

### **(C) BOOKS RECOMMENDED**

1. Naik, J.P. (1965). Educational Planning in India. New Delhi: Allied.
2. Basu, Aparna (1972). Essays in the History of Indian Education. New Delhi: Concept.
3. Dharmpal (1983). The Beautiful Tree: Indigenous Indian Education in the Eighteenth Century. Delhi: Biblia Impex.
4. Drèze, J., and A.K. Sen (1995). Basic Education as a Political Issue, Journal of Educational Planning and Administration, 9 (1) (January): 1-26.
5. Government of India (1950). Constitution of India. New Delhi.
6. Government of India (1985). The Challenge of Education. New Delhi, Ministry of Human Resource Development (Mimeo).
7. Government of India (1986). National Policy on Education 1986. New Delhi: Ministry of

- Human Resource Development.
8. Government of India (1992). National Policy on Education 1986 (Revised). New Delhi: Ministry of Human Resource Development.
  9. Government of India (2001). National Human Development Report 2001. New Delhi: Planning Commission.
  10. Rao, D.B.(2009). Encyclopaedia of Education-Planning and Development.(Vol.I to II).Delhi: APH.

**(D) EVALUATION**

External Examination	70 Marks
Time	3 Hrs
Internal Assessment	30 Marks
Attendance	6
Written Assignment/Project work	12
Two Mid-term Examinations	12

**(E) INSTRUCTIONS FOR THE PAPER-SETTER**

The question paper will consist of three Sections: A, B, and C. Section A and B will have two questions from the respective Sections of the syllabus and will carry 10 marks each. Section C will consist of 10 questions of 3 marks in each which will cover the entire syllabus uniformly.

**(F) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt one question each from the sections A and B and the entire section C.

**SEMESTER – II**  
**PAPER-II**  
**SCHOOL MANAGEMENT**

**(A) OBJECTIVES**

To enable the student teachers to:-

- Understand the concept and importance of school management.
- Understand the concept of time table and co-curricular activities.
- Understand the role of worthy head masters and teachers.
- Understand the roles of students' self-government.
- Understand the concept of supervision.

**(A) SYLLABUS**

**SECTION-A**

- (i) School management-concept, nature, scope, Time table- meaning, types, importance and principles. Discipline- concept, types, freedom and discipline, importance, causes of indiscipline and suggestions.
- (ii) Co-curricular activities-concept, content, types, importance and organisation of different co-curricular activities.

**SECTION - B**

- (i) Leadership: concept, theories and qualities of leader. School Personnel- Head of the institution, teachers and students: their roles and relationships.
- (ii) Student-self Government- concept, different roles of student's self-government. Supervision- concept, types, principles, methods of supervision, defects in existing supervisory programme and suggestions.

**Activities (Any one of the following)**

- (i) Preparation of blue print of the time- table.
- (ii) Organisation of morning assembly at the school/college.
- (iii) Constitute the welfare committees of students.
- (iv) Visit of school as a supervisor.

**(C) BOOKS RECOMMENDED**

1. Kowalski, Theodore. J (2001). Case Studies on Educational Administration (3rd ed.) New York, Longman.
2. Mukhopadhyay, Marmar and Tyagi, R.S (2005). Governance of School Education in India. New Delhi, NIEPA.
3. Jha, Jyotsna, Saxena, K.B.C. and Baxi, C.V (2001). Management Processes in Elementary Education: A Study of Existing Practices in Selected States in India. New, Delhi, The European Commission.
4. Tilak, J. B.G (1992). Education and Structural Adjustment. Prospects 22 (4), 84: 407-22.
5. Drucker (2001). Management Challenges for the 21st Century. New York: Harperbusiness.

6. Glasser (1998). The Quality School, 3rd ed. Harper-perennial Library.
7. Mukerjee, S.N.- Secondary School Administration.
8. Safaya & Shaida- School Administration & Organisation.
9. Sidhu, K.S.- School Organisation & Administration. International Prakashan, Jalandhar.
10. Walia, J.S.-Foundations of School Administration and organisation. Paul.

**(D) EVALUATION**

External Examination	35 Marks
Internal Assessment	15 Marks
Attendance	3
Written Assignment/Project work	6
Two Mid-term Examinations	6

**(E) INSTRUCTIONS FOR THE PAPER-SETTER**

The question paper will consist of three Sections: A, B, and C. Section A and B will have two questions from the respective Sections of the syllabus and will carry 10 marks each. Section C will consist of 5 questions of 3 marks in each which will cover the entire syllabus uniformly.

**(F) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt one question each from the sections A and B and the entire section C.

## ਬੀ.ਐਸ.ਸੀ. ਭਾਗ-ਪਹਿਲਾ (ਸਮੈਸਟਰ)

### (ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ) ਸਮੈਸਟਰ ਪਹਿਲਾ

ਕੁਲ ਅੰਕ : 100

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ : 25 ਅੰਕ

ਬਾਹਰੀ ਪਰੀਖਿਆ: 75 ਅੰਕ

ਸਮਾਂ : 3 ਘੰਟੇ

ਵਿਸ਼ੇ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 35

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 09

ਬਾਹਰੀ ਪਰੀਖਿਆ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 26

(ਅਧਿਆਪਨ: 6 ਪੀਰੀਅਡ ਪ੍ਰਤੀ ਹਫ਼ਤਾ)

#### ਸਿਲੇਬਸ ਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਭਾਗ-ੳ: **ਕਥਾ ਰੰਗ**, ਸੰਪਾ. ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ ਅਤੇ ਡਾ. ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ

ਭਾਗ-ਅ : (1) ਨਿਬੰਧ-ਰਚਨਾ : ਸਮਾਜਕ, ਵਾਤਾਵਰਣ ਅਤੇ ਸਭਿਆਚਾਰ ਵਿਸ਼ੇ ਨਾਲ ਸਬੰਧਤ।

(2) **ਵਿਆਕਰਣ:**

(i) ਪੰਜਾਬੀ ਧੁਨੀ-ਵਿਉਂਤ, ਸਵਰ, ਵਿਅੰਜਨ, ਉਚਾਰਨ ਅੰਗ, ਉਚਾਰਨ ਸਥਾਨ ਤੇ ਉਚਾਰਨ ਵਿਧੀ ਅਨੁਸਾਰ ਧੁਨੀਆਂ ਦਾ ਵਰਗੀਕਰਣ।

(ii) ਸ਼ਬਦ-ਸ਼੍ਰੇਣੀਆਂ ਅਤੇ ਰੂਪਾਂਤਰਨ: ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸੰਬੰਧਕ, ਯੋਜਕ, ਪ੍ਰਸ਼ਨ ਸੂਚਕ ਸ਼ਬਦ।

ਭਾਗ-ੲ: ਭਾਗ-ੳ ਅਤੇ ਭਾਗ-ਅ ਦੇ ਵਿਆਕਰਣ ਵਾਲੇ ਭਾਗ ਵਿਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ।

#### ਅੰਕ-ਵੰਡ ਅਤੇ ਪੇਪਰ ਸੈਂਟਰ ਲਈ ਹਦਾਇਤਾਂ

1. ਸਿਲੇਬਸ ਦੇ ਸਾਰੇ ਭਾਗਾਂ ਵਿਚੋਂ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2. ਪੇਪਰ ਨੂੰ ਤਿੰਨ ਭਾਗਾਂ ਓ, ਅ ਅਤੇ ਏ ਵਿੱਚ ਵੰਡਿਆ ਜਾਵੇਗਾ।

3. ਭਾਗ ਓ ਵਿੱਚੋਂ:

(i) ਕਿਸੇ ਕਹਾਣੀ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ/ ਲੇਖਕਾਂ ਦੇ ਯੋਗਦਾਨ ਜਾਂ ਕਹਾਣੀ ਕਲਾ (ਤਿੰਨ ਵਿੱਚੋਂ ਇੱਕ) 12 ਅੰਕ

(ii) ਪਾਤਰ ਸੰਬੰਧੀ ਜਾਣਕਾਰੀ। | (ਪੰਜ ਵਿੱਚੋਂ ਦੋ) 2x6= 12ਅੰਕ

4. ਭਾਗ ਅ-1 ਕਿਸੇ ਵਿਸ਼ੇ ਤੇ ਨਿਬੰਧ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। (ਤਿੰਨ ਵਿੱਚੋਂ ਇੱਕ) 09ਅੰਕ

2 ਦੇ ਦੋਵਾਂ ਭਾਗਾਂ ਵਿੱਚੋਂ ਇਕ-ਇਕ ਪ੍ਰਸ਼ਨ ਪੱਛਿਆ ਜਾਵੇਗਾ ਅਤੇ ਵਿਦਿਆਰਥੀ ਨੇ ਦੋਵਾਂ ਵਿੱਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਹੋਵੇਗਾ। 12 ਅੰਕ

5. ਭਾਗ-ੲ **ਕਥਾ ਰੰਗ** ਅਤੇ **ਵਿਆਕਰਣ** ਵਾਲੇ ਭਾਗ ਵਿੱਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ 15 (ਪਾਠ ਪੁਸਤਕ **ਕਥਾ ਰੰਗ**

ਵਿੱਚੋਂ 7 ਅਤੇ **ਵਿਆਕਰਣ** ਵਿੱਚੋਂ 8) ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਵਿਦਿਆਰਥੀ ਨੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਸੰਖੇਪ ਉੱਤਰ ਦੇਣੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 2 ਅੰਕ ਹੋਣਗੇ। 15x2=30 ਅੰਕ

#### ਸਹਾਇਕ ਪਾਠ-ਸਮੱਗਰੀ

1. ਹਰਕੀਰਤ ਸਿੰਘ, ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਅਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ, ਬਾਹਰੀ ਪਬਲਿਸ਼ਰਜ਼, ਦਿੱਲੀ, 1973.

2. ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਅਤੇ ਵਿਆਕਰਨ (ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਵਿਸ਼ਾ ਕੋਸ਼), ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2000.

3. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਸਿਧਾਂਤ ਤੇ ਵਿਹਾਰ, ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ, 2008.

4. ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ ਸਿੰਘ, ਸਿਧਾਂਤਕ ਭਾਸ਼ਾ ਵਿਗਿਆਨ, ਮਦਾਨ ਪਬਲਿਸ਼ਰਜ਼, ਪਟਿਆਲਾ, 2002.

5. ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ ਸਿੰਘ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਸ਼੍ਰੋਤ ਤੇ ਬਣਤਰ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 1996.

6. ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ ਸਿੰਘ, ਰੂਪ ਵਿਗਿਆਨ, ਮਦਾਨ ਪਬਲਿਸ਼ਰਜ਼, ਪਟਿਆਲਾ, 2002.

7. ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ, (I, II ਅਤੇ III), ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ, ਜਲੰਧਰ।

8. ਸੁਖਵਿੰਦਰ ਸਿੰਘ ਸੰਘਾ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਗਿਆਨ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ, ਜਲੰਧਰ, 1999.

9. ਖੋਜ ਪਤ੍ਰਿਕਾ (ਗਲਪ ਵਿਸ਼ੇਸ਼ ਅੰਕ), ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ.

10. ਡਾ. ਬਲਦੇਵ ਸਿੰਘ ਧਾਲੀਵਾਲ, ਪੰਜਾਬੀ ਕਹਾਣੀ ਦਾ ਇਤਿਹਾਸ, ਪੰਜਾਬੀ ਅਕਾਦਮੀ, ਦਿੱਲੀ.

## ਬੀ.ਐਸ.ਸੀ. ਭਾਗ-ਪਹਿਲਾ

(ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ)

### ਸਮੈਸਟਰ ਦੂਜਾ

ਕੁਲ ਅੰਕ : 100

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ : 25 ਅੰਕ

ਬਾਹਰੀ ਪਰੀਖਿਆ: 75 ਅੰਕ

ਸਮਾਂ : 3 ਘੰਟੇ

ਵਿਸ਼ੇ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 35

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 09

ਬਾਹਰੀ ਪਰੀਖਿਆ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 26

(ਅਧਿਆਪਨ: 6 ਪੀਰੀਅਡ ਪ੍ਰਤੀ ਹਫ਼ਤਾ)

### ਸਿਲੇਬਸ ਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਭਾਗ-ੳ ਵਾਰਤਕ ਵਿਵੇਕ, ਸੰਪਾ. ਡਾ. ਰਾਜਿੰਦਰ ਪਾਲ ਸਿੰਘ ਬਰਾੜ, ਡਾ. ਜਗਤਾਰ ਸਿੰਘ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।

ਭਾਗ-ਅ-1 ਚਿੱਠੀ-ਪੱਤਰ

#### 2 ਵਿਆਕਰਣ:

(i) ਸ਼ਬਦ-ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ: ਪਰਿਭਾਸ਼ਾ, ਮੁੱਢਲੇ ਸੰਕਲਪ, ਮੂਲ ਰੂਪ, ਅਗੇਤਰ, ਪਛੇਤਰ, ਵਿਉਤਪਤ ਰੂਪ ਅਤੇ ਰੂਪਾਂਤਰੀ ਰੂਪ।

(ii) ਭਾਸ਼ਾ ਵੰਨਗੀਆ: ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਅਤੇ ਉਪ-ਭਾਸ਼ਾ ਦਾ ਅੰਤਰ ਅਤੇ ਅੰਤਰ-ਸਬੰਧ, ਪੰਜਾਬੀ ਉਪ-ਭਾਸ਼ਾਵਾਂ ਤੇ ਪਛਾਣ-ਚਿੰਨ੍ਹ।

ਭਾਗ-ੲ ਉਪਰੋਕਤ ਸਿਲੇਬਸ ਤੇ ਅਧਾਰਤ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ।

### ਅੰਕ-ਵੰਡ ਅਤੇ ਪੇਪਰ ਸੈਂਟਰ ਲਈ ਹਦਾਇਤਾਂ

1. ਸਿਲੇਬਸ ਦੇ ਸਾਰੇ ਭਾਗਾਂ ਵਿਚੋਂ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2. ਪੇਪਰ ਨੂੰ ਤਿੰਨ ਭਾਗਾਂ ਓ, ਅ ਅਤੇ ਏ ਵਿੱਚ ਵੰਡਿਆ ਜਾਵੇਗਾ।

3. ਭਾਗ ਓ ਵਿਚੋਂ:

(i) ਕਿਸੇ ਇਕ ਦਾ ਵਿਸ਼ਾ/ਸਾਰ/ਲੇਖਕਾਂ ਦੇ ਯੋਗਦਾਨ ਜਾਂ ਨਿਬੰਧ ਕਲਾ ਬਾਰੇ ਪ੍ਰਸ਼ਨ।

(ਤਿੰਨ ਵਿੱਚੋਂ ਇੱਕ) 12 ਅੰਕ

(ii) ਨਿਬੰਧਾਂ ਵਿਚਲੇ ਵਿਚਾਰਾਂ ਸਬੰਧੀ ਛੋਟੇ ਉੱਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ।

(ਪੰਜ ਵਿੱਚੋਂ ਦੋ)  $2 \times 6 = 12$  ਅੰਕ

4. ਭਾਗ ਅ-1 ਕਿਸੇ ਵਿਸ਼ੇ ਤੇ ਚਿੱਠੀ/ਪੱਤਰ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ।

(ਤਿੰਨ ਵਿੱਚੋਂ ਇੱਕ) 09 ਅੰਕ

ਅ-2 ਦੇ ਦੋਵਾਂ ਭਾਗਾਂ ਵਿੱਚੋਂ ਇਕ-ਇਕ ਪ੍ਰਸ਼ਨ ਪੁੱਛਿਆ ਜਾਵੇਗਾ ਅਤੇ ਵਿਦਿਆਰਥੀ ਨੇ ਦੋਵਾਂ ਵਿੱਚੋਂ

ਇੱਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਹੋਵੇਗਾ।

12 ਅੰਕ

5. ਭਾਗ-ੲ ਵਿਚ ਪਾਠ ਪੁਸਤਕ ਵਾਰਤਕ ਵਿਵੇਕ ਅਤੇ ਵਿਆਕਰਣ ਵਾਲੇ ਭਾਗ ਵਿੱਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ

15 (ਪਾਠ ਪੁਸਤਕ ਵਾਰਤਕ ਵਿਵੇਕ ਵਿੱਚੋਂ 7 ਅਤੇ ਵਿਆਕਰਣ ਵਿੱਚੋਂ 8) ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

ਵਿਦਿਆਰਥੀ ਨੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਸੰਖੇਪ ਉੱਤਰ ਦੇਣੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 2 ਅੰਕ ਹੋਣਗੇ।

$15 \times 2 = 30$  ਅੰਕ

### ਸਹਾਇਕ ਪਾਠ-ਸਮੱਗਰੀ

1. ਹਰਕੀਰਤ ਸਿੰਘ, ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਅਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ, ਬਾਹਰੀ ਪਬਲਿਸ਼ਰਜ਼, ਦਿੱਲੀ, 1973.
2. ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਅਤੇ ਵਿਆਕਰਨ (ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਵਿਸ਼ਾ ਕੋਸ਼), ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2000.
3. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਸਿਧਾਂਤ ਤੇ ਵਿਹਾਰ, ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ, 2008.
4. ਪ੍ਰੋਮ ਪ੍ਰਕਾਸ਼ ਸਿੰਘ, ਸਿਧਾਂਤਕ ਭਾਸ਼ਾ ਵਿਗਿਆਨ, ਮਦਾਨ ਪਬਲਿਸ਼ਰਜ਼, ਪਟਿਆਲਾ, 2002.
5. ਪ੍ਰੋਮ ਪ੍ਰਕਾਸ਼ ਸਿੰਘ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਸ਼੍ਰੇਣੀ ਤੇ ਬਣਤਰ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 1996.
6. ਖੋਜ ਪਤ੍ਰਿਕਾ (ਨਿਬੰਧ ਅੰਕ), ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ.
7. ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ, (I, II ਅਤੇ III), ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ, ਜਲੰਧਰ।
8. ਸੁਖਵਿੰਦਰ ਸਿੰਘ ਸੰਘਾ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਗਿਆਨ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ, ਜਲੰਧਰ, 1999.



**ENGLISH (COMMUNICATION SKILLS)**  
**B.Sc. Part-I (Semester-II)**

**English Communication Skills**

One paper of 100 marks to be attempted in three hours

No. of Teaching Periods: 75

(Six periods per week)

Pass Marks: 35%

Time: 3 Hours

External: 75 marks

Internal Assessment: 25 marks

**Course Content:**

One Literary Text

Composition

Grammar

**Texts Prescribed:**

(A) *The Poetic Palette* (Orient BlackSwan, Second Edition, 2016)

The following poems from this anthology are prescribed:

1. Pippa's Song: Robert Browning
2. Apparently With No Surprise: Emily Dickinson
3. Fool and Flea: Jeet Thayil
4. Magic Of Love: Helen Farries
5. The Charge of the Light Brigade: Alfred Tennyson
6. Where the Mind is Without Fear: Rabindranath Tagore
7. The Soul's Prayer: Sarojini Naidu
8. I Sit and Look Out: Walt Whitman
9. Women's Rights: Annie Louise Walker
10. Goodbye Party for Miss Pushpa T.S.: Nissim Ezekiel

(B) *Oxford Practice Grammar* by John Eastwood (Ed. 2014)

**Testing:**

**UNIT-I**

Q. No.1. One essay type question with an internal alternative based on main ideas / summary of *The Poetic Palette* (Poems 01 to 05 as mentioned above).

11 marks

Q. No.2. One essay type question with an internal alternative based on main ideas / summary of *The Poetic Palette* (poems 06 to 10 as mentioned above).

10 marks

## UNIT-II

Q. No.3. Two stanzas out of three (from poems 01 to 10 as mentioned above) to be explained with reference to the context. 6+6=12 marks

Q. No.4. Translation from Hindi/Punjabi into English of a given passage consisting of five sentences.

In lieu of Translation

(For Foreign students who do not know Punjabi/Hindi)

Paraphrase of a stanza from a poem of about 5 to 7 lines.) 10 marks

## UNIT-III

Q. No.5. This question shall comprise eight short answer (8x2) and eight objective type questions (8x2) and will be based on the prescribed units and exercises from *Oxford Practice Grammar*. Each question shall carry two marks.

16+16=32 marks

Exercises 04 to 43

### **Important:**

The examiner shall give a clear instruction to the candidates to attempt these questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

## Semester –II

### PAPER A: MECHANICS-II

Maximum Marks : External 30  
Internal 10  
Total 40

Time Allowed: 3 Hours  
Total Teaching hours: 40  
Pass Marks: 35 %

Out of 40 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 10 marks, and the final examination at the end of the semester carries 30 marks.

#### Instruction for the Paper Setter

The question paper will consist of three sections A, B and C . Each of sections A and B will have four questions from respective sections of the syllabus. Section C will have 07 short answer type questions (Candidate is to attempt any five questions), which will cover the entire syllabus uniformly. Each question of sections A and B carry 05 marks. Section C will carry 10 marks of 2 marks each.

#### Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and Consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

#### SECTION A

Rigid body motion: Rotational motion, principal moments and axes. Euler's equations; precession and elementary gyroscope. Galilean transformation and Invariance, Non-Inertial frames, concept of stationary universal frame of reference and ether. Michelson-Morley experiment and its result.

#### SECTION B

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

#### TEXT BOOKS:

1. Mechanics : Berkeley Physics Course, vol. I by C.Kittel, W.D.Knight and M.A.Ruderman, Mc Graw-Hill Publication
2. Mechanics : H.S.Hans and S.P.Puri, Tata Mc Graw Hill Publication, New Delhi

## Semester -II

### PAPER B: VIBRATIONS AND WAVES-II

Maximum Marks : External 30  
Internal 10  
Total 40

Time Allowed: 3 Hours  
Total Teaching hours: 40  
Pass Marks: 35 %

Out of 40 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 10 marks, and the final examination at the end of the semester carries 30 marks.

#### Instruction for the Paper Setter

The question paper will consist of three sections A, B and C . Each of sections A and B will have four questions from respective sections of the syllabus. Section C will have 07 short answer type questions (Candidate is to attempt any five questions), which will cover the entire syllabus uniformly. Each question of sections A and B carry 05 marks. Section C will carry 10 marks of 2 marks each.

#### Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and Consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

#### SECTION A

Stiffness coupled oscillators. Normal co-ordinates and normal modes of vibration. Inductance coupling of electrical oscillators, Types of waves, Wave equation (transverse) and its solution, The string as a forced oscillator, Characteristic impedance of a string. Impedance matching. Reflection and transmission of energy, Reflection and Transmission Energy, Reflection and transmission of string, wave and group velocity. Standing waves on a string of fixed length. Energy of vibrating energy string, wave and group velocity.

#### SECTION B

Physical interpretation of Maxwell's equations. Electromagnetic waves and wave equation in a medium having finite permeability and permittivity but with conductivity  $\sigma=0$ . Pointing vector. Impedance of a dielectric to EM waves, EM waves in a conducting medium and skin depth. EM waves velocity in a conductor an anomalous dispersion. Response of a conducting medium of EM waves. Reflection and transmission of EM waves at a boundary of two dielectric media for normal incidence. Reflection of EM waves from the surface of a conductor at normal incidence.

#### TEXT BOOKS:

1. Fundamentals of Vibrations and Waves by S.P.Puri, Tata McGraw Hill, New Delhi.
2. Physics of Vibrations and Waves by H.J.Pain, Wiley & Sons, New Delhi
3. Waves and Oscillations, by E.Crawford, Berkeley Physics Course, McGraw-Hill Publications, New Delhi.
4. EM Waves and Radiating Systems by Edward C.Jordan and K.G.Balmain, Prentice Hall of India, New Delhi.

## Semester-II

### PAPER C: ELECTRICITY AND MAGNETISM-II

Maximum Marks : External 30  
Internal 10  
Total 40

Time Allowed: 3 Hours  
Total Teaching hours: 40  
Pass Marks: 35 %

Out of 40 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 10 marks, and the final examination at the end of the semester carries 30 marks.

#### Instruction for the Paper Setter

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from respective sections of the syllabus. Section C will have 07 short answer type questions (Candidate is to attempt any five questions), which will cover the entire syllabus uniformly. Each question of sections A and B carry 05 marks. Section C will carry 10 marks of 2 marks each.

#### Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

#### SECTION A

Behaviour of various substances in magnetic field. Definition of  $\mathbf{M}$  and  $\mathbf{H}$  and their relation to free and bound currents. Permeability and susceptibilities and their inter-relationship. Orbital motion of electrons and diamagnetism. Electron spin and paramagnetism. Ferromagnetism. Domain theory of Ferromagnetism. Hysteresis Loss. Magnetisation curve Ferrites.

#### SECTION B

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

#### TEXT BOOKS :

1. Electricity and Magnetism. Berkeley Physics Course. Vol.II by E.M.Purcell, McGraw-Hill, 1965.
2. Fundamentals of Electricity and Magnetism by Author F.Kip, McGraw Hill (1969).
3. Introduction to Classical Electrodynamics by David Griffith, Prentice Hall of India, New Delhi.
4. EM Waves and Radiating Systems by Edward C.Jordan and K.G.Balmain. Prentice Hall of India, New Delhi.

**B.Sc. (Physics)**  
**General Guidelines for Physics Practical Examination**

Maximum Marks : External 22  
Internal 08  
Total 30

1. The student will be asked to perform one experiment out of the experiments mentioned in the syllabus.
2. The distribution of marks is as follows :
  - (i) One full experiment requiring the student to take some data, analyse it and draw conclusions-(candidates are expected to state their results with limits of error. (10)
  - (ii) Brief theory (04)
  - (iii) Viva-Voce (04)
  - (iv) Record(Practical File) (04)
3. There will be one session of 03 hours duration. The paper will consist of 08 experiments out of which an examinee will mark 06 experiments and one of these is to be allotted by the external examiner.
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 students in any group.
6. The student should determine Standard Deviations and probable error in the calculations wherever needed.

**Practical Semester- I**

**(80 Hours)**

1)	Analysis of experimental data by : i) Fitting of given data to a straight line. ii) Calculation of probable error.
2)	To establish relationship between torque and angular acceleration using fly wheel and hence to find inertia of flywheel.
3)	To determine the Young's Modulus by bending of beam.
4)	To study one-dimensional collision using two hanging spheres of different materials.
5)	Determination of Poisson's ratio for rubber.
6)	Study the dependence of moment of inertia on distribution of mass (by noting time periods of oscillations) using objects of various geometrical shapes but of same mass.
7)	To set up CRO for Sine and Square wave and to find their frequency and amplitude.
8)	Study the dependence of solenoidal field on number of turns and current.
9)	To study the magnetic field produced by a current carrying solenoid using a search coil and to find the value of permeability of air.
10)	To determine the value of air capacitance by de-Sauty method and to find the permittivity of air and also to determine the dielectric constant of medium.

11)	To study the efficiency of an electric kettle/heater element with varying input voltages.
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12)	To study the working of energy meter.
13)	Write computer program for the to print out all natural even-odd numbers between given limits.
14)	Write computer program for Numerical solution of equation of motion.
15)	Write computer program for the Motion of particle in a central force field.

### TEXT AND REFERENCE BOOKS

1.	B.Sc. Practical Physics, By C.L.Arora, S.Chand & Co.
2.	A Laboratory Manual of Physics for undergraduate classes by D.P.Khandelwal
3.	Computer programming by R.C.Verma, V.K.Mittal and S.C.Gupta , Vishal Publication, Jalandhar, 2003.
4.	Fortran 77 and Numerical Methods by C.Xavier, New Age Publication, Delhi, 1996.
5.	Computer Oriented Numerical Methods, V.Rajaraman, Prentice Hall of India, New Delhi, 1990.

### Practical Semester II

(80 hours)

1	To study the variation of time period with distance between centre of suspension and centre of gravity for a bar pendulum and to determine i) Radius of gyration of bar pendulum about an axis through its Centre of Gravity and perpendicular to its length. ii) the value of Centre of Gravity, g.
2	Determination of g by Kater's pendulum.
3	Determination of modulus of rigidity of material of a wire using Maxwell's needle.
4	Measurement for logarithmic decrement, co-efficient of damping, relaxation time and quality factor of a damped simple pendulum.
5	To determine the frequency of AC mains using a sonometer and an electro magnet.
6	To determine the low resistance using Carey Foster Bridge.
7	Determination of unknown capacitance by flashing and quenching of neon lamp.
8	Study the phase relationships between voltage and current using impedance triangle.
9	To study the resonance in series and parallel LCR circuits for different resistances and calculate Q-value.

10	To determine the given inductance by Anderson's bridge.
11.	Verify laws of electromagnetic induction.
12.	To study the induced emf as function of velocity.
13.	Write computer program to find maximum, minimum and range of a given set of numbers.
14.	Write computer program to compile a frequency distribution and evaluate moments such as mean, standard deviation etc.
15.	Write computer program To evaluate sum of finite series and the area under a curve.

### TEXT AND REFERENCE BOOKS

1.	B.Sc. Practical Physics, By C.L.Arora, S.Chand & Co.
2.	A Laboratory Manual of Physics for undergraduate classes by D.P.Khandelwal
3.	Computer programming by R.C.Verma, V.K.Mittal and S.C.Gupta Vishal Publication, Jalandhar , 2003.
4.	Fortran 77 and Numerical Methods by C.Xavier, New Age Publication, Delhi, 1996.
5.	Computer Oriented Numerical Methods, V.Rajaraman, Prentice Hall of India, New Delhi, 1990.



## B.Sc. Part-I Syllabus

### SEMESTER II

Paper	Title	Max. Marks	Sem. Paper	Int. Asstt.
I	INORGANIC CHEMISTRY	35	26	09
II	ORGANIC CHEMISTRY	35	26	09
III	PHYSICAL CHEMISTRY	35	26	09
II	PRACTICAL CHEMISTRY	45	16 (Pass Marks)	

### SEMESTER II

#### PAPER-I

#### INORGANIC CHEMISTRY

**Max Marks : 35**

**Semester Paper : 26**

**Internal Assessment: 9**

**Pass Marks : 35%**

**30 hours**

**Time allowed - 3 hrs**

**3 period/week**

#### INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 4 marks each. Section C will consist of 5 short answer questions that will cover the entire syllabus and will be of 2 marks each. Use of scientific non-programmable calculator is allowed.

#### INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B Sections.

#### Section - A

##### 1. Periodic Properties

5 hrs.

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

##### 2. S-Block Elements

5 hrs.

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

##### 3. Group No. 13

5 hrs.

Comparative study (including diagonal relationship) of groups 13 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13; hydrides of boron-diborane and higher boranes, borazine, borohydrides.

## Section - B

### 4. p - Block Elements

15 hrs.

Comparative study (including diagonal relationship) of groups 14-17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 14-17; fullerenes, carbides, fluorocarbons, silicates (structural principle), tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalides.

**SEMESTER II  
PAPER-II  
ORGANIC CHEMISTRY**

**Max Marks : 35**  
**Semester Paper : 26**  
**Internal Assessment: 9**  
**Pass Marks : 35%**

**30 hours**  
**Time allowed - 3 hrs**  
**3 period/week**

**INSTRUCTIONS FOR THE PAPER SETTER**

The question paper will consist of three sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 4 marks each. Section C will consist of 5 short answer questions that will cover the entire syllabus and will be of 2 marks each. Use of scientific non-programmable calculator is allowed.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B Sections.

**Section - A**

**1. Arcns and Aromaticity**

8 Hrs.

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

**Aromaticity:** the Huckel rule, aromatic ions.

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

Methods of formation and chemical reaction of alkylbenzenes alkynyl benzenes.

**2. Alkenes, Cycloalkenes**

6 Hrs.

Nomenclature of alkenes-methods of formation, mechanisms and dehydration of alcohols and dehydrohalogenation of alkyl halides regioselectivity in alcohol dehydration. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes-mechanisms involved in hydrogenation, electrophilic and free radical additions Markownikoff's rule, hydroboration-oxidation, oxymercuration reduction. Epoxidation, ozonolysis, hydration, hydroxylation and oxidation with  $\text{KMnO}_4$ . Polymerization of alkenes. Substitution and the allylic and vinylic positions of alkenes. Industrial application of ethylene and propene.

Methods of formation, conformation and chemical reactions of Cycloalkenes.

## Section – B

### 3. Dienes And Alkynes

7 Hrs.

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

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

### 4. Alkyl and aryl halides

9 Hrs.

Nomenclature and classes of alkyl halides, methods of formation chemical reactions. Mechanisms of nucleophilic substitution reactions of alkyl halides,  $S_N2$  and  $S_N1$  reactions with energy profile diagrams.

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

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

## SEMESTER II PAPER-III PHYSICAL CHEMISTRY

**Max Marks : 35**

**Semester Paper : 26**

**Internal Assessment: 9**

**Pass Marks : 35%**

**30 hours**

**Time allowed - 3 hrs**

**3 period/week**

### INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 4 marks each. Section C will consist of 5 short answer questions that will cover the entire syllabus and will be of 2 marks each. Use of scientific non-programmable calculator is allowed.

### INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B Sections.

## Section - A

### 1. Solutions, Dilute Solutions and Colligative Properties

8 Hrs.

Ideal and non-ideal solutions, methods of expressing concentration of solutions, activity and activity coefficients.

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

Abnormal molar mass, degree of dissociation and association of solutes.

**2. Colloidal State** 7 Hrs.

Definition of colloids, classification of colloids

Solids in liquids (sols): properties-kinetic, optical and electrical; stability of colloids protective action, Hardy-Schulze law, gold number.

Liquids in liquids (emulsions) types of emulsions, preparation, Emulsifiers.

Liquids in solids, (gels) classification, preparation and properties inhibition. General applications of colloids.

**Section – B**

**3. Chemical Kinetics and catalysis** 15 Hrs.

Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction- concentration, temperature, pressure, solvent, light, catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions-zero order, first order, second order, pseudo order, half life and mean life. Determination of the order of reaction-s-differential method, method of integration, method of half life period and isolation method.

Radioactive decay as a first order phenomenon.

Theories of chemical kinetics, effect of temperature on rate of reaction. Arrhenius equation, concept of activation energy.

Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis). Expression for the rate constant based on equilibrium constant and thermodynamic aspects.

Catalysis and general characteristics of catalytic reactions. Homogeneous catalysis, acid base catalysis and enzyme catalysis including their mechanisms, Michaelis Menten equation for enzyme catalysis and its mechanism.

**PRACTICAL CHEMISTRY II  
SEMESTER II**

Max Marks : 45

6 Periods / week

Passing Marks : 35%

**INSTRUCTIONS FOR THE  
PAPER SETTERS EXAMINERS/CANDIDATES**

In this session in morning students will perform physical and organic chemistry practicals. Examiner will again conduct viva-voce of students.

- 1) The examiner should preferably give different liquids solids to the candidates for the determination of boiling point/melting point and crystallization from the list of liquids/solids by the paper setter.

- 2) The paper setter will provide a list of five physical chemistry experiments. The examiner will allot one experiment randomly to each candidate. The candidate will write theory, brief procedure and general calculations of the experiment in the first 10 minutes and thereafter perform the actual experiment.

#### DETAILS OF DISTRIBUTION OF MARKS

1) Melting point/boiling point/crystallization	10 marks
2) Physical chemistry experiment	20 marks
a) Initial write up	7 marks
b) Performance	18 marks
4) Viva-voce	10 marks
5) Note Book	5 marks

#### Laboratory Techniques

##### Determination of melting points:

Naphthalene, 80-82<sup>0</sup>. Benzoic acid, 121.5-122<sup>0</sup>  
 Urea, 132.5-133<sup>0</sup>, Succinic acid, 184.5-185<sup>0</sup>.  
 Cinnamic acid, 132.5-133<sup>0</sup>, Salicylic acid, 157.5-158<sup>0</sup>.  
 Acetanilide, 113.5-114<sup>0</sup>, m-Dinitrobenzene, 90<sup>0</sup>.  
 ρ-Dichlorobenzene, 52<sup>0</sup>, Aspirin, 135<sup>0</sup>.

##### Determination of boiling points

Ethanol, 78<sup>0</sup>, Cyclohexane, 81.4<sup>0</sup>. Toluene, 110.6<sup>0</sup>, Benzene, 80<sup>0</sup>.

##### Crystallization

concept of induction of crystallization  
 Phthalic acid from hot water (using fluted filter paper and seamless funnel)  
 Acetanilide from boiling water  
 Naphthalene from ethanol  
 Benzoic acid from water

#### Physical Chemistry Experiment

20 Marks

##### Chemical Kinetics

- To determine the specific reaction rate of the hydrolysis of methyl acetate/ethyl acetate catalyzed by hydrogen ions at room temperature.
- To study the effect of acid strength on the hydrolysis of an ester.
- Viscosity & Surface Tension of pure liquids.  
To determine the viscosity and surface tension of C<sub>2</sub>H<sub>5</sub>OH and glycerin solution in water
- Molecular weight determined by Part method.

#### Viva Voce

10 Marks

#### Copy

5 Marks

## BOOKS SUGGESTED (THEORY COURSES)

1. *Basic Inorganic Chemistry*. F.A. Cotten. G. Wilkinson and P.L. Gaus. Wiley.
2. *Concise Inorganic Chemistry*. 1.D. Lee. ELBS.
3. *Concepts of Models of Inorganic Chemistry*. B. Doaglas. D. McDaniel and 1. Alexander, John Wiley.
4. *Inorganic Chemistry*. D.E. Shriver, P. W. Aikins and C.H. Langford. <Oxford.
5. *Inorganic Chemistry*. W. W. Porterfield Addison. Wesley.
6. *Inorganic Chemistry*. A.G. Sharpe, ELBS.
7. *Inorganic Chemistry*. G.L. Miessler and O.A. Tarr, Prentice Hall.
8. *Organic Chemistry*. Morrison and Boyd, Prentice Hall.
9. *Organic Chemistry*. L.G. Wade Jr. Prentice Hall.
10. *Fundamentals of Organic Chemistry*. Solomons, John Wiley.
11. *Organic Chemistry*. Vol. I, II & III. S.M. Mukherji, S.P. Singh and R.P. Kapoor, Wiley Eastern Ltd. (New Age International)
12. *Organic Chemistry*. F.A. Aarey, McGraw Hill India.
13. *Introduction to Organic Chemistry*. Stretwieser, Heathcock and Kosover, Machmilan.
14. *Physical Chemistry*. G.M. Barrow, International Student Edition. McGraw Hill.
15. *Basic Programming with Application*. V.K. Jain, 1'ata McGraw Hill.
16. *Computers and Common. Sense*. B. Ryal and Shely, Prentice Hall.
17. *University General Chemistry*. C.N.B. Rao. Macmillan.
18. *Physical Chemistry*. R.A. Alberty, Wiley Eastern Ltd.
19. *The Elements of Physical Chemistry*, P.w. Aikins, Oxford.
20. *Physical Chemistry Through Problems*. S.K. Dogra and S. Dogra. Wiley Eastern Ltd.

## BOOKS SUGGESTED (LABORATORY COURSES)

1. *Vogel's Qualitative Inorganic Analysis*, revised, Svehla, Orient Longman.
2. *Vogel's Textbook of Quantitative Inorganic Analysis* (revised), J. Basseff, R.C. Dennery, G.H. Jeffery and J. Mendham, ELBS.
3. *Standard Methods of Chemical Analysis*, W.w. Scott the Technical Press.
4. *Experimental Inorganic Chemistry*: W.G. Palmer, Cambridge.
5. *Handbook of Preparative Inorganic Chemistry*. Vol. I & II, Brauer, Academic Press.
6. *Inorganic Synthesis*, McGraw Hill.
7. *Experimental Organic Chemistry*. Vol. I & II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.
8. *Laboratory Manual in Organic Chemistry*. R.K. Bansal, Wiley Eastern.'
9. *Vogel's Textbook of Practical Organic Chemistry*. B.S. Furniss, A.I. Harnaford, V. ogers, P.w.G. Smith and A.R. Tatchell, ELBS. -.
10. *Experiments in General Chemistry*. C.N.R. Rao and U.e. Aggarwal. East- West Press.
11. *Experiments in Physical Chemistry*. R.C. Dass and B. Behra, Tata McGraw Hill.
12. *Advanced Practical Physical Chemistry*, J.B. Yadav, Goel Publishing House.
13. *Advanced Experimental Chemistry*. Vol. I: Physical, J.N. Gurtu and R. Kapoor, S. Chand & CO.
14. *Selected Experiments in Physical Chemistry*, N.G. Mukherjee, J.N. Ghose & Sons.
15. *Experiments in Physical Chemistry*. J.e. Ghosh, Bharati Bhavan.

**B.Sc -Ist Year (IInd Semester)**

**MATHEMATICS**

**PAPER-IV: Algebra-I**

**Maximum Marks: 50**

**Minimum Pass Mark : 35 %**

**Time allowed: 3 Hrs.**

**Lectures to be delivered: 5 periods per week**

**University Exam: 36**

**Internal Assessment: 14**

**Teaching hours: 50**

**Instructions for paper-setters**

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and Section C will consist of one compulsory question having seven short answer type questions covering the entire syllabus uniformly. The weightage of Section A and B will be 30% and that of Section C will be 40%

**Instructions for the candidates**

Candidates are required to attempt five questions in all selecting two questions from each section A and B and compulsory question of Section C.

**Section - A**

Hermitian, Skew-Hermitian, Orthogonal and Unitary matrices, .Elementary operation on matrices. Inverse of a matrix using Gauss Jordan Method. Linear independence of row and column vectors, Row rank, Colum rank and their equivalence. Eigen values, Eigen vectors and the characteristic equation of a matrix, Properties of eigen values for special type of matrices, Diagonalization, Cayley-Hamilton theorem. Consistency of a system of linear equations.



## **Section-B**

Relations between roots and coefficients of a general polynomial, Transformation of equation. Descartes' rule of signs, Solution of cubic equations, Biquadratic equations and their solution. De Moivre's theorem and its application, Direct and inverse circular functions, hyperbolic and logarithmic functions. Summation of series.

### **Books Recommended:**

1. Linear Algebra by Scham outline Series.
2. Trigonometry by S.L. Loney. Macmilan and Company London.
3. Text Book of Algebra by Chandrika Prasad.
4. Algebra-I by Sharma and Shah Pearson Ed.

**B.Sc -Ist Year (IInd Semester)  
MATHEMATICS**

**PAPER-V: Partial Differential Equation**

**Maximum Marks: 50**

**Minimum Pass Mark : 35 %**

**Time allowed: 3 Hrs.**

**Lectures to be delivered: 5 periods per week**

**University Exam: 36**

**Internal Assessment: 14**

**Teaching hours: 50**

**Instructions for paper-setters**

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and Section C will consist of one compulsory question having seven short answer type questions covering the entire syllabus uniformly. The weightage of Section A and B will be 30% and that of Section C will be 40%

**Instructions for the candidates**

Candidates are required to attempt five questions in all selecting two questions from each section A and B and compulsory question of Section C.

**Section -A**

**Partial differential equations :** Partial differential equation of first order, Lagrange's solution, , Integral surfaces passing through a given curve, surfaces orthogonal to a given system of surfaces, Partial differential equation of first order but of any degree , Charpit's general method of solution.

**Partial differential equations of second and higher order :** Partial differential equations of the second order and their classification into hyperbolic, elliptic and parabolic types, canonical forms.

**Section –B**

Homogeneous and non-homogeneous partial differential equations with constant coefficients. One dimension Wave and Heat Equation. Two dimensional Laplace equation by separation of variable method and D'Alembert's solution of wave equation.

#### **BOOKS RECOMMENDED**

1. H.T.H. Piaggio : An Elementary Treatise on Differential equations, Barman Press.
2. R.K.Jain and S.R.K.Iyengar : Advanced Engineering Mathematics,Narosa Publishing House.
3. Zafar Ahsan: Differential Equations and Their Applications, Prentice-Hall of India Pvt. Ltd. New Delhi-Second edition
4. I. N. Sneddon : Elements of Partial Differential Equations, Mc Graw Hill Book Co.
5. Rai Singhanian : Ordinary and Partial Differential Equations", S.Chand &Company,New Delhi

**B.Sc -Ist Year (IInd Semester)**

**MATHEMATICS**

**PAPER-VI: Analytic Geometry**

**Maximum Marks: 50**

**Minimum Pass Mark : 35 %**

**Time allowed: 3 Hrs.**

**Lectures to be delivered: 5 periods per week**

**University Exam: 36**

**Internal Assessment: 14**

**Teaching hours: 50**

#### **Instructions for paper-setters**

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and Section C will consist of one compulsory question having seven short answer type questions covering the entire syllabus uniformly. The weightage of Section A and B will be 30% and that of Section C will be 40%

#### **Instructions for the candidates**

Candidates are required to attempt five questions in all selecting two questions from each section A and B and compulsory question of Section C.

#### **Section – A**

**The plane:** General form, Normal form, Intercept form, Reduction of the general form to normal form, Equation of plane through three points, Angle between two planes, Parallel planes, Perpendicular distance of a point from the planes, Pair of the planes, Area of a triangle and

Volume of a tetrahedron.

**The straight line:** Equation of a line in general form, Symmetric form, two point form, Reduction of the general equation to the symmetrical form, Straight line and the planes, Conditions of parallelism and perpendicularity of a line and a plane, Plane through a given line, Perpendicular distance formula for the line, Projection of a line on a given plane containing them, Condition of intersection of two lines, Shortest distance between two lines, intersection of three planes.

### **Section – B**

**Sphere:** General equation of a sphere, Plane section of a sphere, Intersection of two spheres, Sphere through a given circle, Intersection of a straight line and a sphere, Equation of a tangent plane to sphere, Condition of tangency. Plane of contact, Orthogonal Spheres, Angle of intersection of two spheres, Length of tangent, Radical plane, Coaxial system of spheres.

**Cone:** Equation of a cone whose vertex is at origin, Equation of a cone with a given vertex and a given conic as base, Condition that general equation of second degree represent a cone, Equation of a tangent plane, Condition of tangency of a plane and a cone, Reciprocal cone, Right circular cone

### **Text Books**

1. S.L. Loney : The Elements of Coordinate Geometry, Macmillan and Company, London.
2. Gorakh Prasad and H.C.Gupta:Text Book on Coordinate Geometry, Pothishala Pvt. Ltd., Allahabad.
3. P.K. Jain and Khalil Ahmad:A Text Book of Analytical Geometry of two Dimensions, Wiley Eastern Ltd. 1994.
4. N.Saran and R.S. Gupta, : Analytical Geometry of Three Dimensions,Pothishala Pvt. Ltd. Allahabad.

### **RECOMMENDED READINGS**

1. R. J.T. Bell : Elementary Treatise on Coordinate Geometry of Three Dimesions, Macmillan India Ltd., 1994