जननायक चन्द्रशेखर विश्वविद्यालय, बलिया

Jananayak Chandrashekhar University, Ballia

A State University established under Uttar Pradesh State University Act 1973

# Faculty of Education

## Rules, Regulations & Curriculum

## 4 Years Integrated B.A.B.Ed./B.Sc.B.Ed. Programme

## (Semester Wise)

## Session 2024-25

## Jananayak Chandrashekhar University, Ballia

25.7.24

## 4 YEARS (B.A.B.Ed./B.Sc.B.Ed.) INTEGRATED COURSE

The purpose of four year (B.A.B.Ed./B.Sc.B.Ed.) Integrated Course is to prepare competent and committed teachers who would be able to function effectively at school level notwithstanding the scope for pursuing Higher Education Programmes in any of the streams Science/Humanities/Social Science/Pedagogy after completion of the Integrated Course as formulated hereunder:

**Objectives**

The course aims at enabling the student teacher to-

- acquire competencies in respect of Science / Humanities / Social Science discipline for teaching subjects on the basis of accepted principles of learning and teaching.
- develop Skills, understanding, interests and attitude which enable him/her to become effective teacher for the emerging new educational scenario.
- develop skills in identifying, selecting, innovating and organizing learning experiences for teaching the required subjects.
- acquire competence in organizing programmes based on Constructivist Paradigm and Experiential Learning.
- develop understanding of Educational, Psychological, Sociological, Administrative and Managerial aspects of schools.
- understand theoretical and practical aspects of values, health, environmental and recreational activities.
- to promote needed professionalization for becoming competent teachers rooted in moral ethics and values.
- to inculcate the Samsakarasa for integration of knowledge and skills leading to the preparation of effective teachers for the 21st century.

25.07.24

## Eligibility for Admission

### B.A. B.Ed.

Candidates seeking admission to B.A. B.Ed. programme should have passed +2 from recognized Board/University or an equivalent examination with 50% marks in the aggregate. Relaxation upto 5% of marks shall be given to the SC/ST candidates.

### B.Sc. B.Ed.

Candidates seeking admission to the B.Sc. B.Ed. programme should have passed in science stream +2 from recognized Board/University or an equivalent examination with 50% marks in the aggregate. Relaxation upto 5% of marks shall be given to the SC/ST candidates.

## Admission Procedure

Admission shall be made on merit on the bases of marks obtained in the qualifying examination and in the entrance examination or any other selection process as per the policy of the state government/university.

## Duration

The duration of (B.A. B. Ed. / B.Sc. B.Ed.) Course will be of eight semesters ranging over a period of 4 years including intensive job training programmes. The first semester will be from July to December. While the second semester will be from January to May of the academic session concerned. The remaining subsequent semesters will be scheduled following this pattern.

## Working Days

There shall be at least two hundred working days each years exclusive of the period of examination and admission.

## Fees

The institution shall charge only such fees as in prescribed by the affiliating body/state government.

25.07.24

**Medium**

The medium of instruction and examination for (B.A. B. Ed. / B.Sc. B.Ed.) Course will be Hindi/ English.

**Eligibility for Appearing (B.A. B. Ed. / B.Sc. B.Ed.) Examination**

**(a) Attendance in**

I. The minimum attendance shall have to be 80% for all course and practicum.

II. The Head of the Department will, however, have discretion to condone deficiency in attendance to the extent of 10% for valid reasons.

III. The Vice-Chancellor may consider the question of condoning deficiency in attendance, not covered under clause (ii) above, if he is satisfied on merits of each individual case.

**(b) Evaluation and Scale of Gradation**

1- In each semester the two types of evaluation will be carried out – Formative and Summative. There will be two formative and one summative tests in each semester. Formative Tests will take into account the Sessional Assessment /Unit Test /Grading as prescribed from time to time.

2- Summative Tests will be conducted towards the end of each semester. In order to be eligible for automatic promotion to subsequent semester the candidate should have cleared all the prescribed papers / courses and should obtained atleast 40% marks or atleast a D grade on a 5 point scale on both formative and summative tests conducted in a semester.

3- The distribution of marks / grading in a semester will be regulated as follows:

25.07.24

| Percentage of Marks | Categorization | Grading |
|---|---|---|
| 75% and above | Outstanding (Distinction) | A |
| 60% and above but below 75% | Very Good (First Div) | B |
| 50% and above but below 60% | Good(Second Div) | C |
| 40% and above but below 50% | Average (Pass) | D |
| Below 40% | Not Satisfactory (Fail) | E |

4- A student who obtains E grade in two or more than two papers in a semester will be required to repeat the entire semester whereas a student obtaining E grade in just one paper will be given the facility for re-appear in the same paper at the time of subsequent semester examination. The re-appear facility will not be allowed more than two for a particular paper.

5- The final categorization / grading will be done by averaging the marks/grades obtained by a candidate in all the eight semesters including pedagogy related papers / courses. The pattern of classification or grading will be as indicated in paragraph b (3).

6- The evaluation for both general and professional courses (B.A.B.Ed/ B.Sc.B.Ed. Integrated) will be reflected with a final grade or marks earned by a candidate in all the semesters. However, the evaluation for Pedagogy related course shall also be reflected separately for theory and practicals in order to enable the students to pursue higher level courses in Pedagogy. The same pattern may be followed for B.A/B.Sc. component of the programme with a view to enabling students to seek admissions in higher education courses of the concerned disciplines.

7- For practical evaluation two external examiner will be appointed one member from university other than M.G. Kashi Vidyapith and other member from within the university but not the same college where evaluation is conducted.

25.07.24

8- The examiner from both theory and practical shall be appointed from a panel of examiners prepared by Board of Studies in Education.

9- It will be at the discretion of the Head/Department to forward or reject the Examination Form, if the student fails to comply with the essential requirements in respect of Attendance, Project and Practical work and general demeanor.

10- For the supervision of teaching practices, community work and practical examination partial allowance and reimbursement of expenditure for travel etc will be allowed on the basis of the rates, approved by The Vice Chancellor for university department and Management authority designated for college. For university department finance officer will provide the required amount to the Head of Department at least two week in advance.

# Course Structure of Integrated B.A. B.Ed.

The student opting for B.A. B.Ed. shall be required to choose three subjects from the list given below in addition to the compulsory subjects pedagogy related courses.

Note- Select any three subjects maximum two subjects from a group.

Group A- Hindi, English, Sanskrit

Group B- Psychology, Sociology, Philosophy, History

Group C- Political Science, Economics, Geography

**SEMESTER-I**

| S.No. | Name of Subject | Paper Code | Course Title | Marks | Credits |
|---|---|---|---|---|---|
| 1 | Hindi<br>हिन्दी | 101 | प्राचीन काव्य | 100 | 4 |
| 2 | English<br>अंग्रेजी | 101 | Poetry | 100 | 4 |
| 3 | Sanskrit<br>संस्कृत | 101 | नाटक, छन्द एवं अलंकार | 100 | 4 |
| 4 | Psychology<br>मनोविज्ञान | 101 | Basic Psychological Process<br>मनोवैज्ञानिक प्रक्रियाओं के मूल आधार | 75 | 3 |
| 5 | Sociology<br>समाजशास्त्र | 101 | Introduction to Sociology<br>समाजशास्त्र का परिचय | 100 | 4 |
| 6 | Philosophy<br>दर्शन | 101 | Indian Philosophy<br>भारतीय दर्शन | 100 | 4 |
| 7 | History<br>इतिहास | 101 | History of India (1206-1739)<br>भारत का इतिहास (1206–1739) | 100 | 4 |
| 8 | Political Science<br>राजनीति विज्ञान | 101 | Political Theory<br>राजनीतिक सिद्धान्त | 100 | 4 |
| 9 | Economics<br>अर्थशास्त्र | 101 | Principles of Economic Analysis<br>आर्थिक विश्लेषण के सिद्धान्त | 100 | 4 |
| 10 | Geography<br>भूगोल | 101 | Physical Geography<br>भौतिक भूगोल | 75 | 3 |
| | Pedagogy Related<br>(B.Ed.) | 101 | Philosophical Dimensions & Challenges of Education<br>शिक्षा के दार्शनिक आयाम एवं चुनौतियाँ | 100 | 4 |

25.07.24

## SEMESTER-II

| S.No. | Name of Subject | Paper Code | Course Title | Marks | Credits |
|---|---|---|---|---|---|
| 1 | Hindi<br>हिन्दी | 201 | आधुनिक गद्य साहित्य | 100 | 4 |
| 2 | English<br>अंग्रेजी | 201 | Prose | 100 | 4 |
| 3 | Sanskrit<br>संस्कृत | 201 | काव्य एवं व्याकरण | 100 | 4 |
| 4 | Psychology<br>मनोविज्ञान | 201 | Human Development<br>मानव विकास | 75 | 3 (2P) |
| | | | Practical | 50 | |
| 5 | Sociology<br>समाजशास्त्र | 201 | Society in India: Structure and Change<br>भारत में समाज : संरचना और परिवर्तन | 100 | 4 |
| 6 | Philosophy<br>दर्शन | 201 | Modern Western Philosophy<br>आधुनिक पाश्चात्य दर्शन | 100 | 4 |
| 7 | History<br>इतिहास | 201 | The Rise of Modern Western Thought (1453-1789)<br>आधुनिक पश्चिमी चिन्तन का अभ्युदय (1453–1789) | 100 | 4 |
| 8 | Political Science<br>राजनीति विज्ञान | 201 | National Movement & Constitution of India<br>राष्ट्रीय आंदोलन और भारत का संविधान | 100 | 4 |
| 9 | Economics<br>अर्थशास्त्र | 201 | Indian Economic Problems<br>भारतीय आर्थिक समस्याएँ | 100 | 4 |
| 10 | Geography<br>भूगोल | 201 | Human Geography<br>मानव भूगोल | 75 | 3 (2P) |
| | | | Practical | 50 | |
| | Pedagogy Related (B.Ed.) | 201 | Psychological Dimensions of Education<br>शिक्षा के मनोवैज्ञानिक आयाम | 100 | 4 |

25.07.24

## SEMESTER-III

| S.No. | Name of Subject | Paper Code | Course Title | Marks | Credits |
|---|---|---|---|---|---|
| 1 | Hindi<br>हिन्दी | 301 | आधुनिक काव्य | 100 | 4 |
| 2 | English<br>अंग्रेजी | 301 | Drama | 100 | 4 |
| 3 | Sanskrit<br>संस्कृत | 301 | वेद, व्याकरण एवं अनुवाद | 100 | 4 |
| 4 | Psychology<br>मनोविज्ञान | 301 | Psychopathology<br>मनोविकृति विज्ञान | 75 | 3 |
| 5 | Sociology<br>समाजशास्त्र | 301 | Indian Society: Issues and Problems<br>भारतीय समाज : मुद्दे और समस्याएँ | 100 | 4 |
| 6 | Philosophy<br>दर्शन | 301 | Ethics<br>नीतिशास्त्र | 100 | 4 |
| 7 | History<br>इतिहास | 301 | History of India (1740-1947)<br>भारत का इतिहास (1740–1947) | 100 | 4 |
| 8 | Political Science<br>राजनीति विज्ञान | 301 | An Outline History of Western Political Thought<br>पाश्चात्य राजनीतिक चिन्तन की रूपरेखा | 100 | 4 |
| 9 | Economics<br>अर्थशास्त्र | 301 | National Income Analysis, Money and Banking<br>राष्ट्रीय आय विश्लेषण, मुद्रा एवं बैंकिंग | 100 | 4 |
| 10 | Geography<br>भूगोल | 301 | Economic Geography<br>आर्थिक भूगोल | 75 | 3 |
| | Pedagogy Related (B.Ed.) | 301<br>302 | Educational Management and leadership शैक्षिक प्रबन्धन एवं नेतृत्व<br>Educational Measurement and Evaluation शैक्षिक मापन एवं मूल्यांकन | 100<br>100 | 4<br>4 |

25.07.24

## SEMESTER-IV

| S.No. | Name of Subject | Paper Code | Course Title | Marks | Credits |
|---|---|---|---|---|---|
| 1 | Hindi<br>हिन्दी | 401 | हिन्दी साहित्य का इतिहास | 100 | 4 |
| 2 | English<br>अंग्रेजी | 401 | Fiction | 100 | 4 |
| 3 | Sanskrit<br>संस्कृत | 401 | काव्य एवं कवि–परिचय | 100 | 4 |
| 4 | Psychology<br>मनोविज्ञान | 401 | Social Psychology<br>समाज विज्ञान | 75 | 3 (2P) |
| | | | Practical | 50 | |
| 5 | Sociology<br>समाजशास्त्र | 401 | Social Change and Social Control<br>सामाजिक परिवर्तन एवं सामाजिक नियन्त्रण | 100 | 4 |
| 6 | Philosophy<br>दर्शन | 401 | Logic<br>तर्कशास्त्र | 100 | 4 |
| 7 | History<br>इतिहास | 401 | History of Modern Europe (1789-1919)<br>आधुनिक यूरोप का इतिहास (1789–1919) | 100 | 4 |
| 8 | Political Science<br>राजनीति विज्ञान | 401 | Comparative Government<br>तुलनात्मक सरकार | 100 | 4 |
| 9 | Economic<br>अर्थशास्त्र | 401 | Public Finance and International Trade<br>लोक वित्त एवं अन्तर्राष्ट्रीय व्यापार | 100 | 4 |
| 10 | Geography<br>भूगोल | 401 | Geography of India<br>भारत का भूगोल | 75 | 3 (2P) |
| | | | Practical | 50 | |
| | Pedagogy Related (B.Ed.) | 401 | Action Research in Education<br>शिक्षा में क्रियात्मक अनुसंधान | 100 | 4 |
| | | 402 | Environmental Education<br>पर्यावरण शिक्षा | 100 | 4 |

25.07.24

**SEMESTER-V**

| S.No. | Name of Subject | Paper Code | Course Title | Marks | Credits |
|---|---|---|---|---|---|
| 1 | Hindi<br>हिन्दी | 501 | साहित्य सिद्धान्त और आलोचना | 100 | 4 |
| 2 | English<br>अंग्रेजी | 501 | History of English Literature | 100 | 4 |
| 3 | Sanskrit<br>संस्कृत | 501 | काव्य | 100 | 4 |
| 4 | Psychology<br>मनोविज्ञान | 501 | Psychological Assessment & Statistics<br>मनोवैज्ञानिक मूल्यांकन एवं सांख्यिकी | 75 | 3 |
| 5 | Sociology<br>समाजशास्त्र | 501 | Foundations of Sociological Thought<br>समाजशास्त्रीय चिन्तन के आधार | 100 | 4 |
| 6 | Philosophy<br>दर्शन | 501 | Problems of Philosophy (Indian & Western )<br>दर्शन की समस्याएँ (भारतीय एवं पाश्चात्य) | 100 | 4 |
| 7 | History<br>इतिहास | 501 | Indian National Movement (1857-1947)<br>भारतीय राष्ट्रीय आन्दोलन (1857–1947) | 100 | 4 |
| 8 | Political Science<br>राजनीति विज्ञान | 501 | Principles of Public Administration<br>लोक प्रशासन के सिद्धान्त | 100 | 4 |
| 9 | Economics<br>अर्थशास्त्र | 501 | Economics of the Less Developed Countries<br>अल्प विकसित देशो का अर्थशास्त्र | 100 | 4 |
| 10 | Geography<br>भूगोल | 501 | Geographical thought<br>भौगोलिक चिन्तन | 75 | 3 |
| | Pedagogy Related (B.Ed.) | 501 | Educational Technology<br>शैक्षिक तकनॉलाजी | 100 | 4 |

25.07.24

**SEMESTER-VI**

| S.No. | Name of Subject | Paper Code | Course Title | Marks | Credits |
|---|---|---|---|---|---|
| 1 | Hindi<br>हिन्दी | 601 | भाषा विज्ञान एवं हिन्दी भाषा | 100 | 4 |
| 2 | English<br>अंग्रेजी | 601 | Indian English Literature | 100 | 4 |
| 3 | Sanskrit<br>संस्कृत | 601 | काव्यशास्त्र, व्याकरण एवं निबंध | 100 | 4 |
| 4 | Psychology<br>मनोविज्ञान | 601 | Systems of Psychology<br>मनोविज्ञान की पद्धतियाँ | 75 | 3 (2P) |
| | | | Practical | 50 | |
| 5 | Sociology<br>समाजशास्त्र | 601 | Social Research Methods<br>सामाजिक अनुसन्धान की पद्धतियाँ | 100 | 4 |
| 6 | Philosophy<br>दर्शन | 601 | Philosophy of Religion<br>धर्म दर्शन | 100 | 4 |
| 7 | History<br>इतिहास | 601 | Cultural and Economic History of India (1206-1900)<br>भारत का सांस्कृतिक एवं आर्थिक इतिहास (1206–1900) | 100 | 4 |
| 8 | Political Science<br>राजनीति विज्ञान | 601 | Indian Political Thought<br>भारतीय राजनीतिक चिन्तन | 100 | 4 |
| 9 | Economics<br>अर्थशास्त्र | 601 | Economic Policy of India<br>भारत की आर्थिक नीति | 100 | 4 |
| 10 | Geography<br>भूगोल | 601 | Environmental Studies<br>पर्यावरण अध्ययन | 75 | 3 (2P) |
| | | | Practical | 50 | |
| **Practical (B.Ed.)** | | | | 100 | 4 |
| 1. Micro Teaching- at least 8 skills.<br>सूक्ष्म शिक्षण– कम से कम 8 कौशल। | | | | 25 | |
| 2. Action Research Project- Based on School/Class/Community Problem.<br>क्रियात्मक अनुसंधान योजना– विद्यालय/कक्षा/सामुदायिक समस्याओं पर आधारित। | | | | 20 | |
| 3. Use of ICT and development of power point presentation (PPT) including improvisation of teaching aids.<br>सूचना एवं सम्प्रेषण तकनालजी का अनुप्रयोग तथा पावर प्वाइंट प्रस्तुतियों का विकास जिसमें शिक्षण उपकरणों का निर्माण भी शामिल है। | | | | 20 | |

| | | |
|---|---|---|
| 4. Personality development with emphasis on- Communication skill including language use and improvement of speech.<br>व्यक्तित्व विकास– सम्प्रेषण कौशल (भाषा प्रयोग एवं वाक् सुधार सहित) पर बल देते हुए। | 15 | |
| 5. Internship - I (4 weeks)<br>School visit: (primary/upper primary/ secondary) and preparation of status report about various facilities provided in the school.<br>विद्यालय भ्रमण : प्राथमिक/उच्च प्राथमिक/माध्यमिक विद्यालय एवं विद्यालयों में उपलब्ध विभिन्न संसाधनों की एक रिपोर्ट तैयार करना। | 20 | |

25.07.24

**SEMESTER VII**

| | | | |
|---|---|---|---|
| 701- Pedagogy of School Subject – 1 | विषय शिक्षण–1 | 100 | 4 |
| 702 -Pedagogy of School Subject – 2 | विषय शिक्षण–2 | 100 | 4 |

**Pedagogy of School Subjects – Paper Code 701 and 702**

Pedagogy of two school subject have to be selected from the following groups in which only one subject is to be selected from each group:

निम्नलिखित संवर्गों में से किन्हीं दो विषयों का चयन करना है जिसमें एक संवर्ग से एक ही विषय का चयन करना है :

| Group A | Group B |
|---|---|
| 1. Hindi teaching<br>हिन्दी शिक्षण | 1. History teaching<br>इतिहास शिक्षण |
| 2. Sanskrit teaching<br>संस्कृत शिक्षण | 2. Geography teaching<br>भूगोल शिक्षण |
| 3. English teaching<br>अंग्रेजी शिक्षण | 3. Civics teaching<br>नागरिक शास्त्र शिक्षण |
| | 4. Economics teaching<br>अर्थशास्त्र शिक्षण |

**Practical (B.Ed.)-**

Internship -II (16 weeks) (School Attachment) 200 Marks (8 Credits)

1. Participation in school chores such as prayers, assembly, organization of co-curricular activities etc. 10 Marks
   विद्यालयी क्रियाकलापों यथा प्रार्थना, दैनिक सभा एवं पाठ्यक्रम सहगामी क्रियाओं के आयोजन में प्रतिभाग।
2. Practice teaching-30 lesson each subject total 60 lesson, supervised by B.Ed. faculty. 80+80= 160 Marks
   शिक्षण अभ्यास– बी0एड0 पर्यवेक्षकों के निर्देशन में प्रत्येक विषय से 30 पाठ कुल 60 पाठ।
3. Community work सामुदायिक कार्य 10 Marks
4. Scouting and Guiding -Under the guidance of an authorized trainer with certificate. 10 Marks
   स्काउटिंग एवं गाइडिंग– प्राधिकृत प्रशिक्षक के निर्देशन में प्रमाण पत्र सहित
5. Yoga Education – Under the guidance of a formally trained yoga expert with certification from the concerned institution. 10 Marks
   योग शिक्षा– औपचारिक रूप में प्रशिक्षित योग विशेषज्ञ के निर्देशन में प्रमाण पत्र सहित।

25.07.24

**SEMESTER-VIII**

| S.No. | Name of Subject | Paper Code | Course Title | Marks | Credits |
|---|---|---|---|---|---|
| 1 | Hindi<br>हिन्दी | 801 | उपन्यास, कहानी एकांकी तथा अन्य लघु गद्य विधाएं | 100 | 4 |
| 2 | English<br>अंग्रेजी | 801 | New Literatures in English | 100 | 4 |
| 3 | Sanskrit<br>संस्कृत | 801 | भारतीय दर्शन एवं संस्कृति | 100 | 4 |
| 4 | Psychology<br>मनोविज्ञान | 801 | Organizational Behaviour<br>संगठनात्मक व्यवहार | 100 | 4 |
| 5 | Sociology<br>समाजशास्त्र | 801 | Pioneers of Indian Sociology<br>भारतीय समाजशास्त्र के अग्रेतर विचारक | 100 | 4 |
| 6 | Philosophy<br>दर्शन | 801 | Social and Political Philosophy<br>सामाजिक एवं राजनैतिक दर्शन | 100 | 4 |
| 7 | History<br>इतिहास | 801 | History of Modern World (1920-1947)<br>आधुनिक विश्व का इतिहास (1920–1947) | 100 | 4 |
| 8 | Political Science<br>राजनीति विज्ञान | 801 | International Politics<br>अन्तर्राष्ट्रीय राजनीति | 100 | 4 |
| 9 | Economic<br>अर्थशास्त्र | 801 | Quantitative Methods<br>परिमाणात्मक विधियाँ | 100 | 4 |
| 10 | Geography<br>भूगोल | 801 | Regional studies of any one of the following regions<br>(A) South West Asia<br>दक्षिण पश्चिम एशिया<br>(B) South East Asia<br>दक्षिण पूर्व एशिया<br>(C) Far East Asia<br>सुदूर पूर्व एशिया | 100 | 4 |
| | Pedagogy Related (B.Ed.) | 801 & 802 | Any two of the following elective papers (specialization)<br>A. Human Rights, Non Violence and Peace Education<br>मानवाधिकार, अहिंसा एवं शांति शिक्षा | 100<br>100 | 4<br>4 |

| | | | | | |
|---|---|---|---|---|---|
| | | | B. Special Education<br>विशिष्ट शिक्षा<br>C. Elementary Education<br>प्राथमिक शिक्षा<br>D. Educational and Vocational Guidance<br>शैक्षिक एवं व्यावसायिक निर्देशन<br>E. Value Education<br>मूल्य शिक्षा | | |

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# Curriculum for Integrated B.A. B.Ed.

**SEMESTER-I**

## हिन्दी

## 101– प्राचीन काव्य

Credits- 4

इस प्रश्नपत्र में अंकों का विभाजन इस प्रकार रहेगा–

3 व्याख्या – 3 X 10 = 30 अंक, 2 निबन्धात्मक प्रश्न – 2 X 20 = 40 अंक

5 लघु उत्तरीय प्रश्न – 5 X 6 = 30 अंक **पूर्णांक –100**

**पाठ्य–विषय :**

**मध्ययुगीन काव्य : डॉ0 सत्यनारायण सिंह**

प्रकाशक–विश्वविद्यालय प्रकाशन, वाराणसी।

1– संकलित कवि – कबीर, रैदास, मलिक मुहम्मद जायसी, सूरदास, गोस्वामी तुलसीदास, बिहारीलाल, घनानन्द, भूषण।

(क) रस अलंकार और छन्द : रस, अलंकार और छन्द पर निम्नलिखित प्रश्न पूछे जायेंगे–

1. रस और उसके अवयवों का सामान्य परिचय, रसों का वर्गीकरण–लक्षण एवं उदाहरण

2. (अ) शब्दालंकार–अनुप्रास (छेका, वृत्ति, लाटा), श्लेष, वक्रोक्ति।

(ब) अर्थालंकार–उपमा, प्रतिवस्तूपमा, अनन्वय, प्रतीप, रूपक, उल्लेख, स्मरण, भ्रांतिमान, संदेह, अपह्नुति, उत्प्रेक्षा, अतिशयोक्ति दृष्टांत, व्यतिरेक, समासोक्ति, व्याजस्तुति, विरोधाभास, विभावना असंगति, मीलित।

3. छन्द (अ) मात्रिक चौपाई, रोला, गीतिका, हरिगीतिका, वीर (अर्द्धसम), बरवै, दोहा, सोरठा।

(ब) वर्णवृत्त–इन्द्रवज्रा, उपेन्द्रवज्रा, वंशस्थ, भुजंगप्रयात, वसन्ततिलका, मालिनी, शिखरिणी, मदाक्रांता, शार्दूलविक्रीडित, सवैया, कवित्त।

(ख) महाकाव्य, खण्ड काव्य, मुक्तककाव्य। रस, अलंकार, छन्द से दो तथा कवियों से तीन लघु उत्तरीय प्रश्न विकल्प सहित पूछे जायेंगे। लघु उत्तरीय प्रश्नों के उत्तर तीन सौ शब्दों से अधिक न हो।

**अनुमोदित ग्रंथ :**

- त्रिवेणी – रामचन्द्र शुक्ल
- कबीर – हजारी प्रसाद द्विवेदी
- बिहारी वाग्विभूति – विश्वनाथ प्रसार मिश्र
- बिहारी का नया मूल्यांकन – बच्चन सिंह
- काव्यांग कौमुदी – आचार्य विश्वनाथ प्रसाद मिश्र

## English Literature
## 101- Poetry

**Marks- 100 Credits- 4**

**Unit-I**

Ten short answer questions based on the entire course including three passages for explanation.

**Unit-II**

**Forms of Poetry**

1. The Sonnet
2. The Elegy
3. The Ode
4. The Epic
5. The Ballad
6. The Lyric
7. The Dramatic Monologue
8. Allegory

**Stanza Forms**

1. The Heroic Couplet
2. The Blank Verse
3. The Spenserian Stanza
4. Terza Rhyme

**Unit-III**

| | |
|---|---|
| **William Shakespeare:** | **'True Love'** |
| John Donne: | 'Twicknam Garden' |
| Michael Drayton: | 'Since There's No Help Left....' |

**Unit-IV**

| | |
|---|---|
| Alexander Pope | 'From Essay on Man' (Lines 1 – 18) |
| Thomas Gray | 'Hymn to Adversity' |
| William Blake | 'A Poison Tree' |

**Unit-V**

| | |
|---|---|
| William Wordsworth: | 'The World is Too Much with Us' |
| Robert Bridges | 'Nightingales' |
| W.B.Yeats | 'Lake Isle of Innisfree' |

Q.N0.1-Ten short answer questions based on the entire course including three passages for explanation. 30 marks

Q.N0.2- Long answer questions on any two of the prescribed poets. 20+20= 40 marks

Q.N0.3- Five short questions to be asked on the forms of poetry. 10 marks

Q.N0.4- Two questions to be asked on the text. 20 marks

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## English Literature
## 101- Poetry

**Marks- 100 Credits- 4**

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Ten short answer questions based on the entire course including three passages for explanation.

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1. The Sonnet
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Q.N0.4- Two questions to be asked on the text. 20 marks

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संस्कृत

101– नाटक, छन्द एवं अलंकार

पूर्णांक– 100 Credits- 4

इकाई (i) – अभिज्ञानशाकुन्तलम् अंक 1–3 तक 25

इकाई (ii)– अभिज्ञानशाकुन्तलम् अंक 4–7 तक 25

इकाई (iii) – नाट्यशास्त्रीय पारिभाशिक शब्द 10

(साहित्यदर्पण षष्ठ परिच्छेद के अनुसार)

सूत्रधार, नान्दी, प्रवेशक, विष्कम्भक, आकाशभाषित, जनान्तिक, अपवारित, चूलिका, विदूषक और भरतवाक्य।

इकाई (iv) – छन्द 20

अनुष्टुप्, इन्द्रवज्रा, उपेन्द्रवज्रा, उपजाति, भुजङ्गप्रयात, तोटक, वंशस्थ, वसन्ततिलका, मालिनी, मन्दाक्रान्ता, शिखरिणी, शार्दुलविक्रीडित, स्त्रग्धरा, हरिणी, प्रहर्षिणी और आर्या।

इकाई (v)– अलंकार 20

अनुप्रास, यमक, श्लेष, उपमा, रूपक, उत्प्रेक्षा, अतिशयोक्ति, स्वभावोक्ति, अर्थान्तरन्यास, दीपक, तुल्ययोगिता, विभावना, विशेषोक्ति, प्रतिवस्तूपमा, अनन्वय, अप्रस्तुतप्रशंसा, समासोक्ति और सन्देह।

संस्तुत ग्रन्थ

- अभिज्ञानशाकुन्तलम् – कालिदासः – डॉ0 शिव बालक द्विवेदी
- अभिज्ञानशाकुन्तलम् – कालिदासः – डॉ0 निरूपण वेदालंकार
- अभिज्ञानशाकुन्तलम् – कालिदासः – डॉ0 कपिलदेव द्विवेदी
- अभिज्ञानशाकुन्तलम् – कालिदासः – डॉ0 राजदेव मिश्र
- अभिज्ञानशाकुन्तलम् – कालिदासः – डॉ0 सुधाकर मालवीय
- अभिज्ञानशाकुन्तलम् – कालिदासः – डॉ0 गंगासागर राय
- छन्दोऽलंकारमंजरी – कालिदासः – डॉ0 बाँकेलाल गिश्र
- छान्दोऽलंकारसौरभम् – कालिदासः – अभिराज डॉ0 राजेन्द्र मिश्र

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## Psychology

## 101- Basic Psychological Processes

**Unit- I** **Marks- 75 Credits- 3**

Brief historical background, Approaches to the study of behaviour, Nature and scope of psychology. S-O-R model. Methods of psychology: observation, experimental, field study, interview and questionnaire. Physiological bases of behaviour: Neuron, structure and function of brain and spinal cord, autonomic nervous system, glands.

**Unit- II**

Sensory and perceptual processes- Structure and function of eye and ear. Perception- Meaning, Figure and ground, Laws of perceptual organization, illusion, movement perception. Attention - types and determinants.

**Unit- III**

Learning- Nature, Theories of learning: Trial and error, Insight, classical and instrumental conditioning. Memory: Nature and types, measures of retention. Forgetting: Meaning and causes, Theories of forgetting- disuse, perseveration consolidation and interference theory.

**Unit- IV**

Emotion: Nature of emotion, physiological changes during emotions, Theories of emotion: James-Lange and Cannon-Bard theory. Motivation: Innate and acquired motives, achievement, power, affiliation and approval motive.

**Books Recommended:**


- Atkinson and Hilgard (2002). Introduction to Psychology. New York: Thomson Wadsworth.
- Baron, R. A. (1995). Psychology: The Essential Science. New York: Allyn and Bacon.
- Feldman, R. S. (2006). Understanding Psychology. India: Tata McGraw Hill.
- Lefton, L. A. (1985). Psychology. Boston: Allyn and Bacon.
- Morgan, C. T., King, R.A. Weiz, J. R., Schopler, J. (2001). Introduction to Psychology. Tata McGraw Hill.
- सिंह, अरूण कुमार (2008) : आधुनिक सामान्य मनोविज्ञान, मोतीलाल बनारसी दास, वाराणसी।
- अजीमुर्रहमान (1998) : सामान्य मनोविज्ञान, मोतीलाल बनारसी दास, वाराणसी।
- सिंह, आर.एन. (2005) : आधुनिक सामान्य मनोविज्ञान, अग्रवाल प्रकाशन, आगरा


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## Sociology

## 101- Introduction to Sociology

**Marks- 100 Credits- 4**

**Objectives:**

This introductory paper is intended to acquaint the students with sociology as a social science and the distinctiveness of its approach among the social science. It is to be organized in such a way that even students without any previous exposure to sociology could acquire an interest in the subject and follow it.

**Course Outline:**

**Unit-I- The Nature of Sociology**

The meaning of Sociology: Origin, Definition, Scope, Subject matter, Nature and relation of sociology with other social Sciences. Humanistic orientation to Sociological study.

**Unit-II- Basic concepts**

Society, community, Institution, Association, Group, Social structure, status and role, Human and Animal Society. Institutions. Family and kinship, religion, education, State.

**Unit-III- The Individual and Society**

Culture, Socialization, Relation between individual and society.

**Unit-IV**

**The use of Sociology.**

Introduction to applied sociology-Sociology and social problems, Ecology and Environment: Pollution, Global warming and Green house effect. Impact of Industrialization and Urbanization on Environment.

**Essential Readings:**


- Bottommore. T.B. 1972, Sociology: A guide to problems and literature. Bombay: George Allen and Unwin (India)
- Harlambos, M.1998. Sociology: Themes and perspectives. New Delhi Oxford University Press.
- Inkeles, Alex, 1987. What is Sociology ? New Delhi: Prentice-Hall of India.
- Jaiaram, No. 1988. What is Sociology .Madras: Macmillan, India
- Johnson, Harry M. 1995. Sociology: A Systematic Introduction. New Delhi, Allied Publishers.
- Schaefer, Richard T. and Robert P. Lamm. 1999 Sociology. Tata-McGraw Hill, New Delhi.

## Philosophy

## 101- Indian Philosophy

**Marks- 100 Credits- 4**

**Unit- I**

Chief Characteristics of Indian Philosophy, Charvaka Philosophy- Epistemology, Mctaphysics and Ethics.

**Unit- II**

Jaina and Bauddha Philosophy-Jaina: Substance (Dravya) and it's kinds, Syadvada, Anekantavada, Bondage and Liberation, Bauddha: Four Noble Truth, Pratityasamutpad, Nirvana, Kshanikavad (Momentariness), Anatmavada.

**Unit -III**

**Nyaya-Vaishesika-**Epistemology-Pratyaksha; Anuman and their Kinds, Padartha and its Kinds.

**Samkhya:Yoga-** Purusha & Prakriti:nature and proofs for their existence, Evolution Theory, Satkaryavada,Yoga-Darshan Ashtangyoga and God,

**Unit-IV**

**Mimansa and Vedant-** Mimansa- Nature of 'Dharma' Pramanyavad. AdvaitaVedant-Brahman, Maya, Jiva, Bondage and Liberation Vishistadvaita- Refutation of Shankara's Conception of Maya. The Relation between Brahman and Jiva, Brahman, World (Jagat) and Jiva.

**Suggested Reading**


- M.Hiriyanna : Outlines of Indian Philosophy (Hindi and English Version).
- C.D. Sharma : A Critical Survey of Indian Philosophy (Hindi and English Version).
- Datta & Chatterji : Indian Philosophy (Hindi and English Version)
- S. Radhakrishnan : Indian Philosophy Vol. I & II (Hindi and English Version).
- हरेन्द्र प्रसाद सिन्हा : भारतीय दर्शन की रूपरेखा
- संगम लाल पाण्डेय : भारतीय दर्शन का सर्वेक्षण
- बी0एन0सिंह : भारतीय दर्शन की रूपरेखा
- बलदेव प्रसाद उपाध्याय : भारतीय दर्शन
- हृदय नारायण मिश्र : भारतीय दर्शन


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## History

## 101- History of India (1206-1739)

**Marks- 100 Credits- 4**

**Unit-I**

Foundation and Consolidation of the Delhi Sultanate-Aibak, Iltutmish, Razia and Balban.

**Expansion :-**

a. Khiljis-Conquests, Administrative and Economic Reforms, Deccan Policy
b. Tughlaqs-Mohammad-Bin-Tughlaq and Feroz Shah Tughlaq.

**Unit-II**

Timur's invasion.

Causes and Upshots First Battle of Panipat.

Humayun-His difficulties, Battle with Sher Shah and the Causes of his failure. Sher Shah-Administration and Reforms.

Akbar-Conquests, Rajput Policy, Religious Policy and Din-i-Ilahi, Akbar as National Monarch.

**Unit-III**

Jahangir-His administration and Nurjahan's Supremacy on his administration. Shah Jahan-His reign represents the Golden age of Mughal History, Deccan Policy. Aurangzeb-North-Western Frontier Policy, Rajput Policy, Shivaji and Mughal Relation, Religious Policy, Relation with Sikhs and Marathas, Deccan Policy.

**Unit-IV**

Central Structure of the Mughal Empire.

Administration of the Provinces.

Mansabdari and Land Revenue system.

Invasion of Nadir Shah.

Causes of the Downfall of the Mughal Empire.

**Books Recommended**

- Medieval India-Dr. Ishwari Prasad
- Mughal Rule in India-Edward Thomson & Garrat
- मुगल साम्राज्य का उत्थान एवं पतन– डॉ0 राम प्रसाद त्रिपाठी
- दिल्ली सल्तनत– राधेश्याम

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**Political Science**
**101- Political Theory** **Marks- 100 Credits- 4**

**Unit – I**

Definition, Nature and Scope of Political Science, Relation with other Social Science, Methods of Study, Approaches to the study of Political Science: The Behavioral Approach.

**Unit – II**

The State– Its Nature, Origin and Ends. Theories of State Action: Liberalism, Individualism, Idealism, Marxism; Welfare State; Concepts of Sovereignty, Law, Justice, Liberty and Equality.

**Unit – III**

Democracy and Dictatorship; Parliamentary, Presidential and Plural Types; Unitary and Federal forms of Government. Organs of Government: Executive, Legislature, Judiciary.

**Unit – IV**

Public Opinion, Political Parties, Pressure Groups, Electoral Systems.

**Recommended Books**

- E. D. Asirwatham : Political Theory
- A.C. Kapur : Principles of Political Science
- R.C. Agarwal : Political Science
- ज्ञान सिंह सन्धू : राजनीतिक सिद्धान्त
- पन्त, गुप्त, जैन : राजनीतिक शास्त्र के आधार

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## Economics

## 101- Principles of Economic Analysis

**Marks- 100 Credits- 4**

**Unit–I**

**Scope and Method:** Definition, Scope and Subject matter of Economics, Nature of Economic Laws, Equilibrium.

**Theory of Consumer Behavior:** Utility analysis-cardinal and ordinal approaches. Elements of revealed preference, consumer surplus. Indifference curve analysis: properties, consumer equilibrium, income, price and substitution effects.

**Demand Analysis:** Demand function and law of demand, price, cross and income elasticity of demand.

**Unit–II**

**Production:** Production function, combination of factors, laws of production: returns to scales, Law of variable proportions.

**Nature of Costs:** Short-run and long-run cost curves, Revenue analysis.

**Unit–III**

**Market and Price Determination:** Structure of Markets, optimum and representative firm, equilibrium of firm and industry under perfect competition. Price and output under monopoly and price discrimination, Nature of monopolistic competition.

**Unit–IV**

**Economic System:** Capitalism, socialism and mixed economy. Problem of resource allocation.

**Theory of Distribution and Factor Pricius:** Concept and measurement, Net economic welfare, distribution of national income, marginal productivity theory of distribution, theories of rent (Ricardian and Modern Theory, Quasi Rent) , wages (Marginal productivity theory and Modern theory), interest (Classical theory, Loanable funds theory, Liquidity preference theory and Modern theory) and profit (Risk, Uncertainty and Modern theory).

**Books Recommended:**

- Stonier and Hague:- A Text Book of Economic Theory
- R. G. Lipsey ;- An Introduction to Positive Economics
- Samuelson, Paul A:- Economics
- Gould and Ferguson:- Micro Economic Theory
- डॉ0 जे0पी0 मिश्र– आर्थिक विश्लेषण के सिद्धान्त
- एम0एल0 झिंगन– उच्च आर्थिक सिद्धान्त
- एच0एल0 आहूजा– उच्चतर आर्थिक सिद्धान्त

25.07.24

## Geography

## 101- Physical Geography

**Marks- 75 Credits- 3**

**Unit-I**

Lithosphere Nature and Scope of Physical Geography : Geological Time Scale, Origin of the Earth, Interior of the Earth Origin of Continents and Oceans, Isostacy, Earthquakes and Volcanoes, Geosynclines, Mountain Building with special reference to folded mountains, Concept of Plate Tectonics.

**Unit-II**

Rocks-their origin, classification and characteristics, Earth movements- Folding, Faulting and Warping, Weathering and Erosion, Cycle of Erosion by Davis and Penk, Drainage Pattern, Evolution of Land forms by River, Wind, Glacier and Underground water.

**Unit-III**

Atmosphere ; Composition and Structure of atmosphere : Insolation, Horizontal and Vertical distribution of temperature, Atmospheric pressure and winds, Air masses and Fronts, cyclones and anti-cyclones, Humidity, precipitation and rainfall types, Major climate types- Equatorial, Monsoon, Mediterranean, West European and Hot Desert.

**Unit-IV**

Hydrosphere: Ocean Floor, composition of marine water-temperature and salinity, Circulation of Ocean Water Waves, Currents and Tides, Ocean deposits, Corals and atolls, oceans as storehouse of resources for the future.

**Unit-V**

Biosphere Components of Biosphere, Plants and animals evolution, dispersal and distribution: Biotic succession, Biome types and Zoo-geographical regions of the world, Biosphere as a global Eco-System.

**Books Recommended**


- Strahler, A N and Strahler, A.H. : Modern Physical Geography.
- Barry, R.G and Chorley, R.J. Atmosphere, Weather and Climate Routledge, London.
- Trewartha, G.T. Elements of Physical Geography


25.07.24

- Pears, N.: Basis Biography.
- Sharma, R.C. and Hukku, M : Oceanography for Geographers.
- Singh, Savindra : Physical Geography (Eng./Hindi)
- Lal, D.S. : Climatology (Eng./Hindi)
- Singh, J. and Singh, K.N. Bhautik Bhoogol (Hindi)
- Agarwal, K.M.L.: Bhautik Bhoogol (Hindi)
- Tiwari, A.K. Jalvau Vijyan Ke mool tatva - Rajasthan Hindi Grantha Academy Jaipur 2000.
- Lake, P. (1979) Physical Geography, Cambridge University Press, Cambridge.
- Dayal P. Bhautik Bhoogol.

## Pedagogy Related

### 101- Philosophical Dimensions and Challenges of Education

**Marks- 100 Credits- 4**

**Objectives**

The student teacher will be able to:-

1. Understand the development of Indian Education in different periods of time.
2. Appreciate the problems of Indian education.
3. Spell out the importance and role of education in the progress of Indian society.
4. Give meaning to the divergent philosophies behind education.

**Contents**

**Unit-I: Concept of Education**

a) Education: Meaning, Nature and Scope of Education.

b) Functions of Education in the context of Individual, Social and National level.

c) Agencies of Education: school, community and family.

d) Four Pillars of learning in the 21st century context.

**Unit- II: Philosophical Dimensions of Education**

(a) Philosophy and Education: Significance of studying philosophy in understanding educational practices and problems. Relationship between philosophy and education.

(b) Major Philosophical thoughts: Idealism, Naturalism and Pragmatism with their educational implications.

(c) Educational thinkers and their contribution in developing principles of education- Mahatma Gandhi, Tagore, Aurobindo, Vivekanand and J. Krishnamurti.

**Unit-III: Development of Indian Education System**

(a) Vedic system of Education, Buddhist and Medieval system of education.

(b) Major committees and commissions in Pre-Independence period- Wood's Dispatch, Hunter commission and Sadler commission.

(c) Major commissions and policies in Post-Independence period- University

Education Commission, Secondary Education and National Education Commission ,NPE-1986 and Revised NPE-1992.

(d) Constitutional commitments for education: Fundamental rights & duties.

**Unit-IV: Current Problems in Indian Education**

(a) Elementary Education and its major problems: Universalization of Elementary Education, Wastage and Stagnation.

(b) Secondary Education and its major problems: Vocationalization, examination reform and its universalization.

(c) Higher Education and its major problems: Privatization and Autonomy.

(d) Problems of Teacher Education,

(e) Role and Functions of NCTE, NCERT, NIOS, UGC and IGNOU.

**Assignment**

The pupil-teacher is expected to conduct a study on school- community relationship and submit a report.

**Transactional Strategies**

Transaction of the course content will be through lectures, discussions, multimedia presentations and interactive sessions.

**Evaluation**

The course content will be of four (4) credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and 20 marks will be for evaluation which shall be done on the basis of sessional work.

**Readings**


- Anand, C.L. (1993). The Teacher Education in Emerging Indian Society, NCERT, New Delhi.
- Bokil, V.P. (1970), Foundation of Education, Modern Book Stall, Pune.
- Broudy, Harry. S (1961). Building a Philosophy of Education, Prentice Hall of India, New Delhi.
- Ghanta, R. and Dash, B.N. (2005), Foundations of Education, Neel Kamal Publications, Hyderabad.


25.07.24

- Humayun, K. (1957), Indian Philosophy of Education, George G. Harper & Co., New Delhi.
- Mishra, B.K. and Mohanty, R.K. (2003), Trends and Issues in Indian Education, Surya Publication, Meerut.
- Nayak B.K. (1997), Education in Emerging Indian Society, Taratarini Publications, Berhampur.
- Saraswati, T.S. (1999), Culture, Socialization and Human Development, Sage Publication, New Delhi.
- Taneja, V.R. (1998), Education Thoughts and Practice, Delhi University Publications, New Delhi.
- Young Pai and Joseph (1964), Philosophical Problems of Education, J.P. Hippin Co., New York.
- Pandey, K.P. (2010), Perspectives in Social Foundations of Education, Sipra Publication, New Delhi.
- Learning the Treasure Within, Jacques Delors Report, 1996.


25.07.24

**SEMESTER-II**

## हिन्दी
## 201– आधुनिक गद्य साहित्य

Credits- 4

इस प्रश्नपत्र में अंकों का विभाजन इस प्रकार रहेगा–

3 व्याख्या – 3 X 10 = 30 अंक, 2 निबन्धात्मक प्रश्न – 2 X 20 = 40 अंक

5 लघु उत्तरीय प्रश्न – 5 X 6 = 30 अंक **पूर्णांक : 100**

**पाठ्यग्रंथ :**

1. निबध नवनीत (परिवर्द्धित नवीन संस्करण) : सं0 डॉ0 सर्वजीत राय एवं डॉ0 श्रद्धानंद, अमृत प्रकाशन, ईश्वरगंगी, वाराणसी।

**संकलित निबन्धकार :** प्रताप नारायण मिश्र, महावीर प्रसाद द्विवेदी, पूर्ण सिंह, रामचन्द्र शुक्ल, हजारी प्रसाद द्विवेदी, हरिशंकर परसाई, विद्यानिवास मिश्र, कुबेरनाथ राय, विवेकी राय।

2. निर्मला (उपन्यास) : प्रेमचन्द

3. अलग–अलग वैतरणी (उपन्यास) : डॉ0 शिवप्रसाद सिंह

4. ध्रुवस्वामिनी (नाटक) : जयशंकर 'प्रसाद',

5. गद्य रूप (सामान्य सैद्धान्तिक परिचय) : निबन्ध, नाटक, उपन्यास, कहानी।

(विविध गद्य रूपों से दो तथा पाठ्यक्रम से तीन लघु उत्तरीय प्रश्न विकल्प सहित पूछे जायेंगे। लघु उत्तरीय प्रश्नों के उत्तर तीन सौ शब्दों से अधिक न हो।)

**अनुमोदित ग्रंथ :**

- हिन्दी उपन्यास – डॉ0 शिवनारायण लाल
- हिन्दी गद्य शैली का विकास – डॉ0 जगन्नाथ प्रसाद शर्मा
- हिन्दी उपन्यास और यथार्थवाद – डॉ0 त्रिभुवन सिंह
- हिन्दी उपन्यास शिल्प और प्रयोग – डॉ0 त्रिभुवन सिंह
- आधुनिक साहित्य निबन्ध – डॉ0 त्रिभुवन सिंह
- हिन्दी नाटक : उद्भव एवं विकास – दशरथ ओझा
- हिन्दी नाटक – डॉ0 बच्चन सिंह
- प्रेमचन्द – रामविलास शर्मा
- काव्य के रूप – गुलाब राय

**English Literature**
**201- Prose**

**Marks- 100 Credits- 4**

**Unit-I**

Ten short answer questions based on the entire course including three passages for explanation

**Unit-II**

Theory of Prose
Types of Prose
Types of Prose Style
Autobiography/Biography and Memoir
Travelogue
Periodical Essay
Formal Essay
Familiar Essay
Poetic Prose (Euphuism)
Prose of Thought

**Unit-III**

| | |
|---|---|
| Bacon | 'Of Studies' |
| Richard Steele | 'The Spectator Club' |
| Joseph Addison | 'Sir Roger at Church' |
| Charles Lamb | 'Dream Children: A Reverie' |

**Unit-IV**

| | |
|---|---|
| Oliver Goldsmith | 'On National Prejudices' |
| G.K.Chesterton | 'On the Pleasures of No Longer Being very Young' |
| R.L.Stevenson | 'Walking Tours' |
| A.G.Gardiner | 'On Superstitions' |

**Unit-V**

| | |
|---|---|
| Robert Lynd | 'On Holidays' |
| J.B.Priestley | 'First Snow' |
| HilaireBellock | 'In Praise of Ignorance' |
| E.V.Lucas | 'A Funeral' |

Q.N.1- Ten short answer questions based on the entire course includingthree passages for explanation 30 marks

Q.N.2 & 3- Long Answer Questions on any two of the prescribed essayists. 20+20=40 marks

Q.N.4- Five short questions to be asked on the forms of essays. 10 marks

Q.N.5- Two questions of 150 words each to critically analyse and appreciate any two of the essays. 20 marks

25.07.24

## संस्कृत

### 201– काव्य एवं व्याकरण

पूर्णांक– 100 Credits- 4

| | |
|---|---|
| इकाई (i) – कुमारसम्भवम् प्रथम सर्ग | 30 |
| इकाई (ii)– नीतिशतकम् श्लोक 1 से 50 तक | 20 |
| इकाई (iii)– लघुसिद्धान्तकौमुदी (संज्ञा एवं अच्–सन्धि–प्रकरण) | 20 |
| इकाई (iv) – लघुसिद्धान्तकौमुदी (हल्–सन्धि और विसर्ग–सन्धि–प्रकरण) | 20 |
| इकाई (v)– हिन्दी वाक्यों का संस्कृत में अनुवाद | 10 |

संस्तुत ग्रन्थ

- नीतिशतकम् – डॉ0 राजेश्वर मिश्र
- कुमारसम्भवम् – डॉ0 शेषराज शर्मा रेग्मी
- लघुसिद्धान्तकौमुदी – डॉ0 दीनानाथ तिवारी
- लघुसिद्धान्तकौमुदी – डॉ0 सुरेन्द्र देव स्नातक

25.07.24

## Psychology

## 201- Human Development

**Marks- 75 Credits- 3**

**Unit-I:** Human development : Nature and Scope. Principles of development, Laws of development, Stages of development, Methods of studying development-longitudinal and cross-sectional, Dynamics of human development- Role of maturation and learning, Heredity and environment, Imitation and identification.

**Unit-II:** Physical development – Meaning, stages, prenatal and postnatal determinants. Development of nervous system and motor abilities, Sensory and perceptual development, Sensory capacities of infant, Perceptual development- dimensions and determinants.

**Unit-III:** Development of cognition and understanding: Meaning and theory of cognitive development, Development of understanding: factors, concept development and language development. Social development : Criteria and stages, Concept and development of emotions, Watson and Bridge's theories. Development of morality- Kohlberg's theory and determinants.

**Unit-IV:** Adolescence: Meaning, characteristics, changes and problems. Exceptional children: Meaning and types- Mentally retarded child, Gifted child, Delinquent child, Backward child. Aging- meaning, characteristics, personal, social, vocational and family adjustment, Factors influencing adjustment during aging.

**Books Recommended**


- Berk, L.E. (2003) : Child Development, 6th Ed., Prentice-Hall, India.
- Hurlock, E.B. (2001) ; Child Development, 6th Ed. Tata McGraw-Hill.
- Libert (1980) : Development Psychology, Sage.
- Winder Zanden : Human Development, Alferd Knof, N.Y.
- लाल, जे.एन. (2000) : आधुनिक विकासात्मक मनोविज्ञान, अग्रवाल प्रकाशन, आगरा।
- सिंह, आर.एन. (2002) : आधुनिक विकासात्मक मनोविज्ञान, अग्रवाल प्रकाशन, आगरा।

सिंह, राजेन्द्र प्रसाद; उपाध्याय, जितेन्द एवं सिंह, राजेन्द्र (2009) : विकासात्मक मनोविज्ञान, मोतीलाल बनारसीदास, वाराणसी।


25.07.24

**Psychology**
**201- Practical**

**Marks- 50 Credits- 2**

(Any **8** of the following **10** practicals)

1. Span of attention (ध्यान विस्तार)
2. Negative after image (निषेधात्मक अनुसंवेदना)
3. Learning curve/Maze learning (अधिगम वक्र/भूल–भूलैया अधिगम)
4. Bilateral transfer (द्विपार्श्विक स्थानान्तरण)
5. Verbal intelligence test (शाब्दिक बुद्धि परीक्षण)
6. Simple Reaction Time (सामान्य प्रतिक्रिया काल)
7. Introvert -Extroversion Test (अन्तर्मुखता–बहिर्मुखता परीक्षण)
8. Measurement of self-esteem in children (बच्चों के आत्म–बोध का मापन)
9. Social/Emotion Maturity test (सामाजिक/संवेगात्मक परिपक्वता परीक्षण)
10. Measurement of moral values (नैतिक मूल्यों का मापन)

## Sociology

### 201- Society in India: Structure and Change

**Marks- 100 Credits- 4**

**Objectives**

It is presumed that student has some familiarity with Indian society by virtue Of the fact that he is a member of it and that he has observed and Experienced some facts of it. However this familiarity is likely to be Superficial selective and rather fragmentary. The course is aimed at rectifying these limitations by presenting a comprehensive, integrated and empirically –based profile of Indian society.

The continuity between the present and the past is an evident feature of Indian society. Though this continuity is reflected ink the structure of the course. The focus is on the contemporary Indian society. It is hoped that the sociological perspective on Indian society presented in this course

will also enable students to gain a better understanding of their own situation and region.

**Course outline**:

**Unit-I**: The structure and composition of Indian Society: Villages, Towns, Cities, Rural, Urban linkages, problem of tribes, weaker section, dalits and O.B.C.'s, efforts for their upliftment, women and minorities population profile and related issues.

**Unit-II:** Cultural and ethnic diversity, diversities in respect of language, caste, regional and religious beliefs and practices and cultural pattern .

**Unit-III:** Basic Institutions of Indian society: Caste, marriage, religion, class, joint family and democracy. Jagmani System.

**Unit-IV:** Culture: Material and Non material culture, cultural lag. Changes and transformation in Indian society ,factors affecting National integration: Regionalism Communalism and Naxalism.

**Essential readings**


- Bose, N.K. 1967, Culture and Society in India, Bombay : Asia Publishing House.
- Bose, N.K. 1975, Structure of Hindu Society. New Delhi.
- Dube, S.C. 1990, Society in India.(New Delhi: National Book Trust.)


25.07.24

- Dube, S.C. 1995, Indian Village (London : Routledge)
- Dube, S.C. 1958: India's changing Villages (London: Routledge and Kegan Paul).
- Karve, Irawati, 1961 : Hindu Society : An Interpretation(Poona : Deccan- College)
- Lannoy, Richard, 1971: The Speaking Tree : A study of Indian Society and Culture (Delhi: Oxford University Press).
- Mandelbaum, D.G. 1970 : Society in India (Bombay: Popular Prakashan)
- Srinivas, M.N. 1980 : India: Social Structure (New Delhi: Hindustan Publishing Corporation)
- Srinivas, M.N. 1963: Social Change in Modern India (California, Berkeley: University of California Press).
- Singh, Yogendra,1973 : Modernization of Indian Tradition ( Delhi: Thomson Press).
- Uberoi, Patricia, 1993: Family, Kinship and Marriage in India, Oxford University Press, New Delhi.


25.07.24

**Philosophy**
**201- Modern Western Philosophy**

**Marks- 100 Credits- 4**

**Unit-I:** Chief Characteristics of Modern Western Philosophy Descartes- Cartesian method, Cogito Ergo Sum, Proofs for the Existence of God, Nature of Substance, Mind Body Relation – Interactionism, Nature of Knowledge.

**Unit-II:** Spinoza & Leibnitz: –Spinoza Substance, Pantheism, Attributes and Modes, Mind- Body Problem- Parallelism,Leibnitz Substance, Nature of Monads, Pre-established Harmony and Mind Body Problem.

**Unit-III:** Locke & Berkeley- Locke-Epistemology- Refutation of Innate Ideas, Nature of Knowledge, Primary and Secondary Quality, Simple and Compound Ideas, Limit of Knowledge, Matter (substance)

Berkeley- Refutation of Abstract Ideas, Subjective Idealism.

**Unit-IV:** Hume- Impressions and Ideas, Association of Ideas, Refutation of self, God, causality, skepticism.

Kant- Criticism, Nature of Knowledge, Synthetic- Apriori Judgements.

**Suggested Reading**


- Fuller B.A.G. : A History of Philosophy
- W.T. Stace : A Critical History of Philosophy
- Falkenberg : A History of Modern Philosophy
- Thilly : A History of Philosophy
- W.K. Wright : A History of Modern Philosophy
- चन्द्रधर शर्मा : पाश्चात्य दर्शन
- याकूब मसीह : पाश्चात्य दर्शन का समीक्षात्मक इतिहास
- संगम लाल पाण्डेय : आधुनिक दर्शन की भूमिका
- जे०एस०श्रीवास्तव : आधुनिक पाश्चात्य दर्शन का इतिहास
- हरिशंकर उपाध्याय : पाश्चात्य दर्शन का उद्भव एवं विकास
- दयाकृष्ण : पाश्चात्य दर्शन Vol. I & II
- हृदयनारायण मिश्र : पाश्चात्य दर्शन :


25.07.24

## History

## 201- The Rise of Modern Western Thought (1453-1789)

**Marks- 100 Credits- 4**

**Unit-I**

Renaissance-Causes and Features.

Reformation-Causes and Upshots, Martin Luther, Calvin.

Counter Reformation-Jesuit Society and other agencies.

Rise and decline of Spain.

Charles V, Philip II.

**Unit-II**

Thirty Year's War-Causes, Expansion and Consequences.

France-Henry IV, Rechelieu, Mazarine and Louis XIV.

The age of Enlightened Despotism.

Frederick the Great.

Russia-Peter the Great and Catherine II.

**Unit-III**

England-Struggle between the Parliament and the first two Stuart Rulers, Growth of Cabinet system and Industrial Revolution.

Austria-Maria Theresa and Joseph II.

**Unit-IV**

The war of Austrian Succession.

The Seven year's war.

Division of Poland.

France on the eve of French Revolution.

**Books Recommended**

- History of Europe-H.A.L. Fisher.
- आधुनिक यूरोप का इतिहास–हीरालाल सिंह और रामवृक्ष सिंह
- आधुनिक यूरोप का इतिहास खण्ड–एक–लाल बहादुर वर्मा
- आधुनिक यूरोप का इतिहास–विमल इन्द्रपाल
- आधुनिक यूरोप का इतिहास–डॉ0 ईश्वरी प्रसाद

25.07.24

## Political Science
## 201- National Movement & Constitution of India

**Marks- 100 Credits- 4**

**Unit – I**

The Birth and Growth of Nationalism of India, The Indian National Congress, The Moderates and the Extremists; Landmarks of India National Movement; Non-Cooperation, Civil Disobedience and Quit India Movement; The Independence Act-1947

**Unit – II**

The Making of the Indian Constitution; Salient Features of the Constitution; Fundamental Rights and Dutics, Directive Principle of State Policy; Indian Federal System; Centre-State Relations

**Unit – III**

The Union Government. The President; The Prime Minister; The Council of Minister, The Parliament; The Supreme Court

**Unit – IV**

State Government; The Legislature; The Executive; The High Court; Panchayati Raj System in India.

**Recommended Books**

- Ruchi Tyagi: Indian Government and Politics
- J.C. Johari: Indian Government and Politics (हिन्दी में भी उपलब्ध)
- एस0एम0 सईदः भारतीय राजनीतिक प्रणाली
- गांधी जी रायः भारतीय शासन एवं राजनीति

25.07.24

## Economics
## 201- Indian Economic Problems

**Marks- 100 Credits- 4**

**Unit – I**

**Nature and Structure of Indian Economy:** Growth and composition. Sectoral development of the Indian Economy and their interrelationship. Utilization of resource human and natural. Problems of population and population policy of India. Need, Objectives and strategy of planning in India. Poverty, unemployment, its nature and extent, Employment policy.

**Unit – II**

**Agriculture:** Trends in production and productivity, reforms, tenurial system, distribution of land, ceilings consolidation of holdings. Agriculture labour and problem wages, employment and under-employment. Agriculture finance, Problems of irrigation and supply of inputs. Market cooperative farming, rural development programmes Technology.

**Change in Agriculture strategy:** Agricultural production strategy. Price policy in agriculture.

**Unit – III**

**Industry and Service Sector:** Growth and Structure of industry. Industrial and licensing policies of major industries, large, small and cottage industries. Industrial finance, foreign capital and multinationals. Industrial labour – wages and wage regulation, social security, housing, industrial peace, Trade Union movement.

**Service Sector:** Nature, Structure and Development.

**Unit – IV**

**Economy of Uttar Pradesh:** Nature, Structure and Development of U.P.'s Economy. U.P. Economy through plans. Demographic Scenario of U. P., Infrastructure: energy, ransport and water resources. Decentralization of planning in U.P. industrial development in U.P.: Public Sector Units, Small Scale Industries, Informal Sector, Hurdles and Prospects. Agriculture, Employment, Poverty, Inter-Regional Disparities and Policy Issues.

**Books Recommended:**

- Alak Ghosh – Indian Economy
- Rudra Dutt & Sundaram – Indian Economy
- Government of India Annual – Economic Survey
- Five Year Plans, Govt. of U. P.
- डॉ. जे. पी. मिश्र – भारतीय अर्थव्यवस्था
- मिश्रा एव ं पुरी – भारतीय अर्थव्यवस्था

## Geography

## 201- Human Geography

**Marks- 75 Credits- 3**

**Unit-I: Concept and Nature:** Meaning, Scope and Development of Human Geography, Man and Environment relationship-Determinism, Possibilism, Neodeterminism, Probabilism, Basic principles-Principle of Activity or Change, Principle of Terrestrial Unity or whole.

**Unit-II: Habitation (Population and Settlement):** Growth and Distribution of population and world pattern; global migration - causes and consequences, concept of over population and under population. Human Settlements - Origin, types (Rural-Urban) characteristics, size and distribution. (India & World: major ones to be emphasized), House types and their distribution with special reference to India.

**Unit-III: Economy:** Evolution of Human Economy; Sequence of human occupance, Primitive Economics-Food gathering, Hunting, Pastoral herding, Fishing, Lumbering and Primitive agriculture. Later major innovations and their impact.

**Unit-IV: Society and Culture:** Evolution of man (Australopithecus, Homo Erectus, Homo Sapiens. Man's spread over the earth during the Pleistocene) cultural Diffusion, Cultural realms. World Human Races-Classification, Characteristics and Distribution.

**Unit-V: Population Tribes:** Some typical modes of life of world Tribes-Eskimos, Kirghiz, Bushman, Masai, Semang and Pygmies.

Habitat, Economy and Society of Indian Tribes-Bhotias, Gaddis, Tharus, Bhil, Gond, Santhal, Nagas (with reference to their present-day transformation)

**Books Recommended**


- Spencer, J.E. and Thomas, W.L. Introducing Cultural Geography.
- Thomas, W.L. (ed.) Man's Role in Changing the Face of the Earth.
- Peripillou, Human Geography
- Smith, D.M. Human Geography-A Welfare Approach, Edwin Arnold, London.
- Forde, C.D., Habitat, Economy and Society
- Dicken, S.N. and Pitts. F.R., Introduction to Human Geography.
- Kaushik, S.D., Manav Bhoogol (Hindi)
- De Blij, H.J., Human Geography, Culture, Society and Space, John Wiley, New York, 1996.


25.07.24

- Chadna, R.C., Population Geography.
- Singh, J, Manav Bhoogol (Hindi)
- Bansal, S.C. Manav Bhoogol (Hindi)
- Srivastava, V.K. and Rao, B.P. Manav Bhoogol
- Singh, L.R.: Human Geography.
- Jordon, T.G. and Lawntre, The Human Mosaic
- Hira Lal, Jansankhya Bhoogol
- Fellman, J.L. Human Geography-Landscapes of Human Activities, Brown and Bench Man, Pub. U.S.A. 1997.
- Michael, Can, New Patterns: Process and change in Human Geography. Nelson, U.K. and Canada, 1996.


25.07.24

## Geography
## 201- Practicals

**Marks- 50 Credits- 2**

**Lab Work**

**Unit-I: The nature and scope of cartography, Scales-** Construction of Comparative, Diagonal and Vernier Scales, Enlargement and Reduction of maps. Calculation of area of maps of different shapes by graphical and arithmetical methods.

**Unit-II: Map Projections** : General Principles : Classification, properties and choice of map projections - Merits and demerits and Construction of Cylindrical Equal area, Mereator's, Conical with two Standard Parallels, Bonne's, Polyconic, Gnomonic Orthographic and Stereographic Polar Zenithal projections.

**Unit-III: Methods of showing relief:** Hachure, shading, contours & layer tints; representation of different landforms by contours. Drawing of profiles - cross & long profiles, superimposed, composite & projected profiles. Slopes & gradients.

**Unit-IV: Topographical Maps**

Introduction: Expansion and Indexing: Coverage, Scale and Topo Symbols. Study and Interpretation of One Inch/1:50,000 Survey of India Toposheetsrepresenting Plain, Plateau and Mountain areas under the following heads- Relief, Drainage Characteristics, Land-use, Settlement types and patterns, and means of Transport and communication with special reference to recognition of Land forms based on contours and profiles drawn on them.

**Division of Marks**

Lab Work-One question from each unit with internal.

| | |
|---|---|
| Choice (Duration - Three Hours) | 40 Marks |
| Viva-Voce & sessional records | 10 Marks |

**Books Recommended**


- Monk house, F.J.: Maps & Diagrams, (1985); Methuen, London.
- Robinson, A.H: Elements of Practical Geography.
- Singh, R.L. Elements of Practical Geography, Kalyani Publishers, New Delhi (English & Hindi).


25.07.24

- Mishra, R.P. and Ramesh, A: Fundamentals of Cartography.
- Singh, L.R. & Singh, R.N. Map work and Practical Geography (Eng./Hindi), Sharda
- Pustak Bhawan, Allahabad.
- Sharma, J.P. Practical Geography (Hindi)
- Lal, Hira : Prayogatmak Bhoogol Ke Adhar (Hindi)
- Tiwari, R.C.and Tripathi, Sudhakar : Abhinav Prayogic Bhoogol, Allahabad


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## Pedagogy Related

## 201- Psychological Dimensions of Education

**Marks- 100 Credits- 4**

**Objectives**

a) The student teacher will be able to:-

b) Understand the meaning and scope of Educational Psychology.

c) Acquire knowledge and understanding of various stages of human development.

d) Develop understanding of the process of learning in the context of various theories of learning and motivation.

e) Understand the concepts of personality, intelligence and creativity.

**Contents**

**Unit I: Educational Psychology and Development of Learner**

(a) Educational Psychology: Meaning, nature, methods, scope and importance of Educational Psychology for teachers.

(b) Concept and principles of growth and development, stages of human development.

**Unit II: Learning and Motivation**

(a) Concept and nature of learning, factors influencing teaching-learning process. Memory and Retention.

(b) Theories of learning: Trial and error, classical conditioning, operant conditioning, theory of insight, constructivism and social learning.

(c) Motivation: Nature, types, some selected content and process theories with special referenced to Abraham Maslow, Alderfer, McClelland and Skinner's reinforcement theory, techniques of enhancing learner's motivation.

**Unit III: Personality, Intelligence and Creativity**

(a) Personality: Meaning, Nature, Trait, Type and Psychoanalytic theories; Methods of assessing Personality.

(b) Intelligence: Nature and Theories, Types of Intelligence, IQ, EQ and SQ; Measurement of Intelligence.

(c) Creativity: Meaning, Nature and Development of creativity among school children.

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**Unit IV: Psychology of Adjustment**

(a) Behavioristic and Psychoanalytic models.

(b) Characteristics of a well-adjusted person.

(c) Stress in the context of Education: Types of stress; Stress management techniques, Role of teachers.

**Practical Work**

Each student will be required to administer any two psychological tests: Intelligence (verbal and non-verbal), creativity, personality, memory and aptitude.

**Assignment**

Conduct a case study on any child who has problems either in learning or in his/ her adjustment to the environment.

**Transactional Strategies**

Transaction of the course will be through lectures, discussion, multimedia presentations and interactive sessions.

**Evaluation**

The course content will be of four (4) credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and rest 20 marks will be credited on the basis of evaluation in respect of sessional work.

**Readings**


- Bernard, H.W. (1961), Mental Hygiene of Classroom Teachers, McGraw Hill, New York.
- Bhatia, H.R. (1965), A Text Book of Educational Psychology, Asia Publishing House, Bombay.
- Cronbach, L.J. (1958), Educational Psychology, Harcourt, New York (2nd ed.)
- Dandekar, W.N. (1976), The Psychological Foundations of Education, Macmillan, Delhi.
- Jacob, W. and Philip, W. (1962), Creativity and Intelligence, John Wiley, New York.
- Kuppuswamy, B. (1986), Social Change in India, Vikas Publishing House, New Delhi.
- Pandey, K.P. (2007), Advanced Educational Psychology, Vishwavidyalaya Prakashan, Varanasi.


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**SEMESTER-III**

## हिन्दी
## 301– आधुनिक काव्य

Credits-4

इस प्रश्नपत्र में अंकों का विभाजन इस प्रकार रहेगा–

3 व्याख्या – 3 X 10 = 30 अंक, 2 निबन्धात्मक प्रश्न – 2 X 20 = 40 अंक

5 लघु उत्तरीय प्रश्न – 5 X 6 = 30 अंक

**पूर्णांक : 100**

**पाठ्यग्रंथ :**

1. आधुनिक हिन्दी काव्य– सम्पादक : डॉ0 शिवकुमार मिश्र, विश्वविद्यालय प्रकाशन, चौक, वाराणसी।

**संकलित कवि :** मैथिली शरण गुप्त, जय शंकर 'प्रसाद', सूर्यकांत त्रिपाठी 'निराला', सुमित्रानन्दन पंत, महादेवी वर्मा, रामधारी सिंह 'दिनकर', सच्चिदानन्द हीरानन्द, वात्स्यायन 'अज्ञेय', वैद्यनाथ मिश्र, 'नागार्जुन', सुदामा पाण्डेय 'धूमिल'।

**अनुमोदित ग्रंथ :**

- कमलाकान्त पाठक – मैथिलीशरण गुप्त : व्यक्ति और काव्य
- रामेश्वर लाल खण्डेलवाल – जयशंकर प्रसाद : वस्तु और काव्य
- डॉ0 राम विलास शर्मा – निराला
- डॉ0 नगेन्द्र – सुमित्रानन्दन पंत
- डॉ0 प्रेमशंकर – स्वच्छन्दतावादी काव्य
- डॉ0 नामवर सिंह – आधुनिक हिन्दी कविता की प्रमुख प्रवृत्तियाँ
- डॉ0 युगेश्वर – प्रसाद काव्य का नया मूल्यांकन
- डॉ0 शम्भूनाथ सिंह – छायावाद युग

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## English Literature
## 301- Drama

**Marks -100 Credits- 4**

**Unit-I:**

Ten short answer questions based on the entire course including three passages for explanation

**Unit-II**

Theory of Drama

Elements of Drama

Tragedy and various types

Comedy and various types

Tragi-comedy

Expressionist Drama

Drama of Ideas

Poetic Drama

Closet Drama

The Problem Play

Theatre of Absurd

**Unit-III**

Shakespeare : Macbeth

**Unit-IV**

Oliver Goldsmith : She Stoops to Conquer

**Unit-V**

G B Shaw : Candida

Q.No. 1-Ten short answer questions based on the entire course including three passages for explanation 30 Marks

Q.No. 2 &3-Two Long Answer Questions from Plays 20+20=40 Marks

Q.No. 4-Five Short Answer Questions on theory and forms of Drama Marks 2X5=10 Marks

Q.No. 5-Two Analytical Questions of 150 words each on the Plays prescribed 10+10=20Marks

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## संस्कृत

### 301– वेद, व्याकरण एवं अनुवाद

पूर्णांक–100 Credits- 4

| | | |
|---|---|---|
| इकाई (i) | – वैदिक सूक्त | 45 |
| | अग्नि सूक्त ऋग्वेद 1–1 | |
| | विष्णु सूक्त " 1–154 | |
| | इन्द्र सूक्त " 2–12 | |
| | पुरुष सूक्त " 10–90 | |
| | शिवसंकल्प सूक्त शुक्ल यजुर्वेद 34/1–6 | |
| | पृथिवी सूक्त अथर्ववेद 12/1–10 | |
| इकाई (ii) | – ईशावास्योपनिषद् | 15 |
| इकाई (iii) | – लघुसिद्धान्तकौमुदी (विभक्त्यर्थ एवं समास प्रकरण) | 30 |
| इकाई (iv) | – अपठित संस्कृत पद्य से हिन्दी में अनुवाद | 10 |

संस्तुत ग्रन्थ

- न्यू वैदिक सेलेक्शन प्रथम भाग – बी0बी0 चौबे
- वेदचयनम् – डॉ0 विश्वरनाथ त्रिपाठी
- वेदचयनम् – डॉ0 कृष्णदत्त मिश्र
- ईशावास्योपनिषद् – डॉ0 कृष्णदत्त मिश्र
- ईशावास्योपनिषद् – डॉ0 विजय शंकर पाण्डेय
- ईशावास्योपनिषद् – डॉ0 गायत्री शुक्ल
- लघुसिद्धान्तकौमुदी – डॉ0 आद्या प्रसाद मिश्र
- श्रुतिसौरभम् – डॉ0 दीपक कुमार
- श्रुतिप्रभा – प्रो0 वृजेश कुमार शुक्ल
- ईशावास्योपनिषद् – डॉ0 शिवबालक द्विवेदी

25.07.24

## Psychology

## 301- Psychopathology

**Marks- 75 Credits- 3**

**Unit-I:** Introduction to psychopathology. Concept of normality and abnormality, View points about abnormality. Classification of mental disorders – DSM IV & ICD-10. Symptoms and syndromes of mental disorders.

**Unit-II:** Models of psychopathology - psychodynamic, behavioral and cognitive. Adjustment mechanisms : Frustration and Defense mechanisms, Conflict. Methods of psychopathology: Case history, interview and projective techniques.

**Unit-III:** Generalized Anxiety disorder: Definition, symptoms and causes. Phobic anxiety disorder- nature, symptoms, types and causes. Obsessive-compulsive disorder- symptoms and causes. Panic Disorder. Psychotic disorders- Schizophrenia : nature, symptoms, types and causes, Delusional disorder: nature, symptoms, types and causes, Mood disorders- nature and types.

**Unit-IV:** Personality disorders: Psychopath personality. Alcohol and drug abuse and dependence. Mental Retardation: Concept, characteristics, types and causes. Dissociative disorders- Nature, types, characteristics and etiology. Conversion disorder: Nature, Symptoms and causes.

**Books Recommended:**


- Carson, R.C.; Butcher, J. N. & Mineka, S. (2010). Abnormal Psychology and Modernlife. Pearson Education, Inc. and Dorling Kindersley publications Inc.
- Sarason, G. I. and Sarason, R. V. (2007). Abnormal Psychology: The Problem of Maladaptive Behaviours (11th Edition). Pearson Education Inc. and Dorling Kindersley Publishing Inc.
- त्रिपाठी, जयगोपाल एवं त्रिपाठी, विवेक (2007) : असामान्य मनोविज्ञान, हर प्रसाद भार्गव, आगरा।
- सिंह, लाभ एवं तिवारी, गोविन्द (2008) : असामान्य मनोविज्ञान, विनोद पुस्तक भण्डार, आगरा।
- सिंह, अरूण कुमार (2009): आधुनिक असामान्य मनोविज्ञान, मोती लाल बनारसी दास, वाराणसी।
- सिंह, आर.एन. (2010) आधुनिक असामान्य मनोविज्ञान, अग्रवाल प्रकाशन, आगरा।

## Sociology

### 301- Indian Society: Issues and Problems

**Marks 100 Credits- 4**

**Objectives:**

Society in India today is undergoing rapid and massive changes. Many of the Changes are such that they tend to call into question the age-old social norms and practices, thus giving rise to some critical social issues and problems.

This course is designed to indentify and analyze come of such emerging Social issues and problems form sociological perspective. In the interest of systematic ordering, the issues and problems have been classified into four sets: structural, familial development and organizational.

The course seeks to go beyond the commonsense understanding of the prevailing social issues and problems in order to project them into their structural context. Accordingly, it focuses on their structural linkages and interrelationships.

Hence the objectives of the course are to sensitize the students to the emerging social issues and problems of contemporary India, enable them to acquire sociological understanding of these issues and problems over and above their commonsense understanding, empower them to deal with these

issues and problems and to serve as change agents both in governmental and non-governmental and organizations.

**Course outlines**

**Unit-I**: STRUCTURAL: Poverty, inequality of caste and gender, Problemes of Religious, ethnic and regional, minorities, backward classes and dalits. Human Rights violation.

**Unit-II**: FAMILIAL: Dowry, domestic violence, divorce, intra and inter- Generational conflict, problemes of elderly.

**Unit-III**: DEVELOPMENTAL: Development induced displacement, ecological degradation, consumerism, crisis of Values.

**Unit-IV**: DISORGANIZATIONAL: Crime and Delinquency, White Collar crime and criminals, drug addiction, suicide, terrorism, cyber crime. Corruption in public sphere.

**Essential readings:**


- Beteille,Andre, 1974, Social Inequality, New Delhi, OUP
- Beteille, Andre, 1992, Backward classes in Contemporary India,New Delhi -OUP.
- Berreman,G.D. 1979, Caste and other inequalities: Essays in inequality- Meerut: Folkore Institute.


25.07.24

- Dube, Leela. 1997. Woman and Kinship. Comperative perspective on Gender in South and Southeast Asia. New Delhi: Sage Publications.
- Gadgil, Madhav and Guha, Ramchandra. 1996. Ecology and Equity:The Use and abuse of nature in Contemporary India. New Delhi. -OUP
- Gill, S.S. 1998. The Pathology of Corruption, New Delhi.:
- Guha, Ranjit, 1991. Subaltern Studies, New York: OUP
- Inden, Ronald.1990 . Imaging India, Oxford: Brasil Blackward.
- Lewis Oscar, 1966. "Culture of Poverty" Scientific American, Vol. II and V No. 4pp. 1925.
- Madan, T.N. 1991, Religion in India, New Delhi. OUP
- Ministry of Home Affairs. 1998. Crime in India. New Delhi. Govt.of India.
- Satya Murty. T.V. 1996 Region, Religion, Caste, Gender and Culture in Contemporary India. New Delhi. OUP.
- Sharma, S.L. 1997. "Towards Sustainable Development in India" In S.R. Mehta (Ed), Population, Poverty, and Sustainable development, Jaipur. Rawat Publications.
- Sharma, Ursula. 1983. Woman, Work and Property in North West India. London : Tavistock.


**References**


- Allen, Douglas (Ed).1991. Religion and Political Conflict in South Asia, West Port Conn. : Connecticut University Press.
- Bardhman .P.1984, Land.: Labour and Rural Poverty. New Delhi. OUP.
- Brekenbridge, C.1996, Consuming Modernity: Public Culture in Contemporary India, New Delhi. OUP.
- Singh, Anoop Kumar 2011. Ramification of Human Rights in India, New Delhi, Serials Publication.
- Guha,Ramchandra,1994. Sociology and the Dilemma of Development. New Delhi: OUP
- Juergensmeier, Mark 1993, Religious Nationalism Confronts the Secular State. New Delhi: OUP
- Sharma, .L. 2000 Empowerment without Antagonism: A case for Reformulation of Woman's Empowerment Approach .Sociological Bulletin. Vol.49. No.1.
- Waxman. 1983. The Stigma of Poverty: A Critique of poverty Theories and policies.


25.07.24

## Philosophy

### 301- Ethics

**Marks- 100 Credits- 4**

**Unit-I** : Definition and nature of Ethics, Nature and object of moral judgements, Freedom of will and moral responsibility- Determinism and Indeterminism, psychological basis of Ethics.

**Unit-II**: Teleological Theories – Utilitarianism-Bentham, and Mill, Evolutionism-Spencer

**Unit–III:** Deonotological Theories – Intutionism – Butler, Rationalism – Kant- Good will, Duty for the duty's sake, categorical imperative, Postulates of morality, Perfectionism.

**Unit-IV**: Niskam Karmyoga and Sthitprajna of Gita, Nietzshe- Revaluation of values, superman, Ethics of Gandhi

**Suggested Reading**

- William Lillie : An Introduction to Ethics
- Mackenzie : A Manual of Ethics
- C.D. Broad : Five types of Ethical Theories
- William K. Frankena : Ethics
- R.A.P. Rogers : A short History of Ethics
- A.C. Eving : Ethics
- S.K. Maitra : The Ethics of Hindus
- वेद प्रकाश वर्मा : नीतिशास्त्र के मूल सिद्धान्त
- संगम लाल पाण्डेय : नीतिशास्त्र का सर्वेक्षण
- बी०एन०सिंह : नीतिशास्त्र
- हृदय नारायण मिश्र : नीतिशास्त्र के प्रमुख सिद्धान्त

25.07.24

## History
## 301- History of India (1740-1947)

**Marks- 100 Credits- 4**

**Unit – I**

Anglo-French rivalry.

Rise of the British Power in Bengal.

Plassey and Buxar-Causes and Significance

Clive's second governship of Bengal

Warren Hastings-Reforms and relation with Avadh, Marathas and Maysore.

Cornwallis and his Reforms.

**Unit – II**

Wellesly-Subsidiary Alliance and Second Anglo-Maratha war.

William Bentinck-Reforms.

Lord Dalhousie-Reforms and Doctrine of Lapse.

Career and Achievenments of Ranjit Singh.

First and Second Anglo-Burmese war.

**Unit – III**

First Anglo-Afghan war.

Upheaval of 1857.

Administration of Lytton, Ripon and Curzon.

**Unit – IV**

The Government of India Act-1909, 1919 and 1935.

Growth of Communalism and the Partition of India.

**Books Recommended**

- History of British India-P.E. Roberts.
- आधुनिक भारत का इतिहास–जयशंकर प्रसाद मिश्र
- आधुनिक भारत–तीन खण्डों में–छाबड़ा
- आधुनिक भारत का इतिहास–रामलखन शुक्ला
- आधुनिक भारत–बी0आर0 ग्रोवर

25.07.24

**Political Science**

**301- An Outline History of Western Political Thought**

**Marks- 100 Credits- 4**

**Unit – I**

Plato, Aristotle, Cicero

**Unit – II**

Main Characteristics of Medical Political Thought and the Church-State Controversy; St. Thomas Aquinas; Machiavelli; Jean Bodin; Montesquieu

**Unit – III**

Thomas Hobbs; John Locke; J.J. Rousseau; Jeremy Bentham; J. S. Mill

**Unit – IV**

Hegel; Karl Mars; T.H. Green; H.J. Laski

**Recommended Books**

- C.L. Wayper: Political thought (हिन्दी में भी उपलब्ध)
- Dunning: A History of Political Theories, Vol. 1-4
- J.P. Suda: History of Political Thought, Vol. 1-3 (हिन्दी में भी उपलब्ध)
- जीवन मेहता : राजीतिक चिन्तन का इतिहास
- प्रभुदत्त शर्मा : राजनीतिक चिन्तन का इतिहास

25.07.24

## Economics

### 301- National Income Analysis, Money and Banking

**Marks- 100 Credits- 4**

**Unit – I: National Income Analysis:** Concept and methods of measurement; Circular flow of product and income, Government and foreign sectors in national income accounts. Determination of National income under classical and Keynesian system. Monatory theories of trade cycle.

**Unit – II: Value of Money:** Fisher and Cambridge approaches. Income-expenditure approach. Keynes' quantity theory. Prices: inflation, deflation. Monetary approach. Keynesian approach. Non-monetary theories of inflation. Effects of deflation. A brief discussion of relationship between inflation and unemployment (Philips curve and modified Philip's curve), Concept of stagflation.

**Unit – III: Banking:** Types and function. Structure and management, assets and liabilities, creation of money. Commercial Bankings: Principles and Practices. Central Banking: Instrument of monetary control and other functions of Central Banks. Indian Monetary Market: Structure, concept and sources of change in money supply, Reserve Bank of India, regulatory and promotional functions.

**Unit – IV: Foreign Exchange:** Concept , demand and supply of foreign exchange; external value of money-gold standard, exchange rate determination, purchasing power parity, theory, International monetary institution-IMF and IBRD. Exchange Control, Objectives and Methods.

**Books Recommended:**


- Manihara, K. K. – Monetary Theory
- Crowther, G. – An Outline of Money
- Halm, G. N. – Monetary Theory / Mudra Siddhant (in Hindi)
- Makinen, Gale – Money: The Price Level and Interest Rate
- Dilard, D. – Keynes Ka Arthashastra
- Ghosh, Alak – Indian Economy
- Rudra Dutt & Sudaram - Indian Economy
- Samuelson, P. A. – Economics
- Stonier & Hague – A Text Book of Economic Theory
- डॉ. जे. पी. मिश्र – मुद्रा बैंकिग एवं अन्तर्राष्ट्रीय व्यापार
- डॉ. एम. एल. सेठ – मुद्रा बैंकिग एवं अन्तर्राष्ट्रीय अर्थशास्त्र


25.07.24

## Geography

## 301- Economic Geography

**Marks- 75 Credits- 3**

**Unit-I:** Nature, Scope and development of Economic Geography. Major concepts-Economic landscape, Stages of economic development, typology of economic activities (Primary, secondary, tertiary, quaternary) Resource-concept and classification.

**Unit-II:** Soil and major soil types, Forest types and their products ; Agricultural Land use and Locational theory by Von Thunen; Distribution production and international trade of principal crops rice, wheat, sugarcane, cotton tea, coffee and rubber, Agricultural regions of the world by Whittlesey.

**Unit-III:** Marine resources and Aquaculture-Major Fishing Areas, their production and trade. Nature of Occurrence, distribution, production and trade of minerals- Iron ore, Manganese, Bauxite, Copper, Mica and Gold (in major producing countries) Power Resources Production and utilization of coal, Petroleum, Hydroelectricity and atomic energy.

**Unit-IV:** Location factors of Industries and their relative significance, Webers theory of Industrial location. Types of industries, Location patterns and development trends of Manufacturing industries-Iron and steel, Textiles, Ship Building, Sugar, Paper and Chemicals. Major Industrial regions of U.S.A. U.K. and Japan.

**Unit-V:** Means and modes of transport-major trans continental railways, International Air and Sea routes; inland water ways (Panama and Suez Canals); Changing pattern of international Trades, Major Trade organizations and trade blocks- COMECON, EFTA, ASEAN, NAFTA, OPEC-their objectives and trade relations.

**Books Recommended**


- Alexander, J.W., Economic Geography, Prentice-Hall, New Delhi.
- Robinson, A.H. Jones, C.F. and Darkenwarld G.G. Principles of Economic Geography.
- Boesh, Hans, A Geography of World Economy, Von Nostrand, New York.
- Bengston and Royen, Fundamentals of Economic Geography.
- Zimmerman, E.W. Introduction to World Resources.
- Chisholm, M., Modern World Development-A Geographical Perspective.
- Singh, K.N. & Singh, J., Arthik Bhoogol ke Mool tatva (Hindi), Gyanodaya Prakashan, Gorakhpur.
- Jain, P, Arthik Bhoogol ki Samiksha (Hindi)
- Srivastava, V.K. & Rao, B.P. Arthik Bhoogol.
- Wheeler, J.O. et al ; Economic Geography, John Wiley, New York 1995.
- Robertson, D (ed.) Globalization and Environment, E.Elgas Co. U.K.,2001.


25.07.24

**Pedagogy Related**

**301- Educational Management and Leadership**

**Marks- 100 Credits- 4**

**Objectives**

The student- teachers will be able to:-

1. Appreciate the Principles, Meaning, Scope, Importance and advantages of School Management.
2. Get acquainted with the concepts of School discipline, School administration, Management, Supervision and Human Relations.
3. Acquire the needed competencies to achieve excellence in managing a school/ classroom.

**Contents**

**Unit I: Concept of School Management**

(a) Meaning and Scope of School Management: Difference between management and leadership.

(b) Nature and Importance of Management processes.

(c) Fundamental Principles of School Management Leadership in the present context.

**Unit II: Maintaining a Secondary School for attaining excellence**

(a) Planning and Executing: Year-plan of the School activities, Work load, School timings, time-table.

(b) Controlling and Monitoring Duties and Functions of Head master, Supervisor, teacher and non-teaching staff. Forming committees, Co-ordination committee; governing body of the School and its role and functions. Supervision and Inspection-Meaning, type, purpose and procedure.

(c) Financing: Sources of grants, budgeting and auditing procedure, Income generation- Endowment funds, reserve funds and development funds.

**Unit III: Management and Leadership**

(a) Concept and Importance of Classroom Management and leadership differentiated.

(b) Difference between School and Classroom Management, School management and School Organization, School Management and School administration.

(c) School Administration: meaning and types. Aacadmemic leadership:Situational leadership style (SLS).

25.07.24

(d) School discipline: Concept and its development.

(e) Human Relations in a school set up.

**Unit IV: Achieving Excellence through leadership**

(a) Criteria of grading a School.

(b) Total Quality Management (TQM): Concept, objectives and importance.

(c) SWOT Analysis: Concept and its Educational Implications.

(d) Resource development- Human, Material and Finance.

**Assignment**

Locating Strength and Weaknesses of any Educational Institution.

**Transactional Strategies**

The course content will be transacted through lectures, discussions, tutorials and report preparations.

**Evaluation**

The course content will be of 4 credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and rest 20 marks will be awarded on the basis of sessional work.

**Readings**


- Agarwal, J.C. (1967), Educational Administration, Arya Book Depot, New Delhi.
- Bhatnagar and Varma, (1978), Educational Administration, Loyal Book Depot, Meerut.
- Bush, T. (1980), Approaches to School Management, Harper & Raw, London.
- Khanna and Others (1983), School Administration, Planning, Supervision and Financing, Doaba House, Delhi.
- Kochhar, S.K. (1964), Secondary School Administration, University Publishers, Delhi.
- Mathur and Kohli, (1970). School Administration and Organization, Krishna Brothers, Jalandhar.
- Mukhopadhyay, M., Management of Change in Education, In search of India Model, NUEPA, New Delhi.
- Neelam Sood (2003), Management of School Education, A.P.H, New Delhi.
- Saffaya and Shaida (1980), School Administration and Organization, Dhanpat Rai and Sons, Jalandhar.
- Mukhapadhyay, Marmer, Total Quality Management in Education, NIEPA, 2001, New Delhi.


25.07.24

## 302- Educational Measurement and Evaluation

**Marks- 100 Credits- 4**

**Objectives**

The student teacher will be able to:-

1. Grasp the basic concepts in measurement and evaluation.
2. Develop skills and competencies for the use of basic techniques in the field of measurement and evaluation.
3. Acquire skills about test designing.
4. Understand the use of relevant statistical measures and their applications.

**Contents**

**Unit- I: Concept and Techniques of Evaluation**

(a) Educational Measurement and Evaluation: Concept, Purpose, Tools and Techniques of evaluation: Levels of measurement-nominal, ordinal, interval and ratio. Taxonomy of educational objectives and its relevance for measurement and evaluation.

(b) New concepts of Evaluation – Formative, Summative and Continuous-and-Comprehensive-Evaluation (CCE).

(c) Norm Referenced and Criterion Referenced Testing (NRT and CRT).

**Unit- II: Designing of tests for evaluation of learning outcomes**

(a) Principles of test construction and standardization.

(b) Characteristics of a good test- reliability, validity, objectivity and practicability.

**Unit- III: Instructional Objectives and their use in test construction**

(a) Instructional Objectives and objective based evaluation.

(b) Classification of test items-essay type and objective type test items and their construction procedures.

**Unit -IV: Educational Statistics**

(a) Concept of statistics, Graphical representation of data.

(b) Measures of Central Tendency- Mean, Median and Mode.

(c) Measures of Variability- Quartile deviation, Average Deviation and Standard Deviation.

(d) Percentiles and Percentile Rank.

(e) Coefficient of correlation- Rank difference and Product moment.

(f) Concept of scaling- C scaling and T scaling.

25.07.24

**Assignment**

Preparation and administration of an achievement test.

**Transactional Strategies**

The course content will be implemented mainly through lectures integrated with Information & Communication Technology (ICT). In addition to this, discussion, brainstorming and quiz sessions will be used as the transactional strategies particularly for units- I, II and III.

**Evaluation**

The course content will be of 4 credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and rest 20 marks will be credited on the basis of evaluation of sessional work.

**Readings**


- Allen, J.P.B. and Davis (1977), Testing and Experimental Methods, Oxford University Press, London.
- Anastasi, A. (1968), Psychological Testing : McMillan and Co .London.
- Bloom, B.S. (1968),Taxonomy of Educational Objectives, David McKay Co., New York.
- Ebel, R.L. (1979), Essential of Educational Measurement and Evaluation, Prentice Hall, New Delhi.
- Garrett, Henry E. (2004), Statistics in Psychology and Education (Tenth Indian Reprint), Vakils, Feffer and Simons Ltd, New Delhi.
- Gupta, S.P. (1993), Measurement and Evaluation, Sharda Publications, Allahabad.
- Nunally, J.C. (1972), Educational Measurement and Evaluation, McGraw Hill Book Company, New York.
- Singh, A.K. (2006), Tests, Measurement and Research Methods in Behavioral Sciences, Bharti Bhawan Printers, Patna.
- Thorndike R.L. & Hagen, E. (1969), Measurement and Evaluation in Psychology and Education, Tata McGraw, New Delhi.
- Pandey, K.P., Fundamentals of Educational Measurement and Evaluation, Vishwavidyalaya Prakashan, Varanasi.


25.07.24

**SEMESTER-IV**

## हिन्दी
## 401– हिन्दी साहित्य का इतिहास

Credits-4

इस प्रश्नपत्र में अंकों का विभाजन इस प्रकार रहेगा–
निबन्धात्मक प्रश्न – 4 x 20 = 80 अंक
4 लघु उत्तरीय प्रश्न – 4 x 5 = 20 अंक

**पूर्णांक : 100**

1. हिन्दी साहित्य के इतिहास का काल–विभाजन, सीमा और नामकरण (प्रमुख विद्वानों के मत)।
2. आदिकाल की प्रमुख रचनाएँ और प्रवृत्तियाँ।
3. भक्ति आन्दोलन के कारण तथा भक्ति का उदभव और विकास।
4. भक्तिकाल की प्रमुख काव्यधाराओं की प्रमुख प्रवृत्तियाँ।
5. भक्तिकाल की सामान्य विशेषताएँ।
6. रीतिकाल का नामकरण, विभिन्न धाराएँ तथा प्रवृत्तियाँ।
7. श्रृंगारेत्तर काव्य प्रवृत्तियाँ–नीति काव्य, भक्ति काव्य तथा वीर काव्य की प्रवृत्तियों का सामान्य परिचय।
8. आधुनिक काल (कविता)–(क) भारतेन्दुयुगीन काव्य प्रवृत्तियाँ (ख) द्विवेदीयुगीन काव्य और उसकी प्रवृत्तियाँ (ग) छायावाद, प्रगतिवाद, प्रयोगवाद तथा नयी कविता : स्वरूप और प्रवृत्तियाँ।
9. आधुनिक हिन्दी (गद्य) की विभिन्न विधाओं (निबन्ध, नाटक, एकांकी, कहानी, उपन्यास, आलोचना) का विकासात्मक परिचय।

**सहायक ग्रंथ :**


- पं0 रामचन्द्र शुक्ल – हिन्दी साहित्य का इतिहास
- डॉ0 लक्ष्मीसागर वार्ष्णेय – हिन्दी साहित्य का इतिहास
- डॉ0 रामकुमार वर्मा – हिन्दी साहित्य का आलोचनात्मक इतिहास
- डॉ0 वासुदेव सिंह – हिन्दी साहित्य का समीक्षात्मक इतिहास
- डॉ0 त्रिभुवन सिंह – हिन्दी साहित्य : एक परिचय
- डॉ0 रामस्वरूप चतुर्वेदी – हिन्दी साहित्य और संवेदना का विकास
- डॉ0 रामचन्द्र तिवारी – हिन्दी का गद्य साहित्य
- डॉ0 बच्चन सिंह – हिन्दी साहित्य का दूसरा इतिहास।


25.07.24

**English Literature**

**401- Fiction**

**Marks-100 Credits-4**

**Unit-I :** Ten short-answer questions based on the entire course.

**Unit-II :** Forms and Techniques, Elements of Novel, Elements of Short Story, Picaresque Novel, Historical Novel, Gothic Novel Epistolary Novel, Regional Novel, Dystopia, Detective Novel, Campus Fiction, Science Fiction, Space Fiction, Metafiction, 'Chic Lit', Junk Fiction Plot, Characterization, Narrative Technique and Structure

**Unit-III:**

Jane Austen Pride and Prejudice

**Unit-IV:**

Charles Dickens David Copperfield

**Unit-V:**

Thomas Hardy The Mayor of Casterbridge

Q.No.1- Ten short-answer questions based on the entire course. 20 Marks

Q.No.2-4- Long answer questions on prescribed novels. 20+20+20 = 60 Marks

Q.No.5- Two questions one on technique and one on forms of novel. 20 Marks

25.07.24

## संस्कृत

### 401– काव्य एवं कवि–परिचय

पूर्णांक–100 Credits- 4

| | | |
|---|---|---|
| इकाई (i) | – किरातार्जुनीयम् प्रथम सर्ग | 40 |
| इकाई (ii) | – शुकनासोपदेशः | 30 |
| इकाई (iii) | – वाल्मीकि एवं व्यास | 10 |
| इकाई (iv) | – अधोलिखित कवि और उनकी कृतियाँ | 20 |

भास, शूद्रक, अश्वघोष, भवभूति, श्रीहर्ष, विशाखदत्त, भट्टनारायण, सुबन्धु, दण्डी और जयदेव।

संस्तुत ग्रन्थ

- किरातार्जुनीयम् – प्रो0 राजेन्द्र मिश्र
- किरातार्जुनीयम् – डॉ0 शिवबालक द्विवेदी
- किरातार्जुनीयम् – प्रो0 श्रीनिवास ओझा
- किरातार्जुनीयम् – डॉ0 रामसेवक दूबे
- शुकनासोपदेशः – डॉ0 तारणीश झा
- संस्कृत–कविदर्शन – डॉ0 भोलाशंकर व्यास
- संस्कृत–साहित्य की रूपरेखा – पं0 चन्दशेखर पाण्डेय
- संस्कृत–साहित्य का इतिहास – पं0 बलदेव उपाध्याय
- संस्कृत–साहित्य का समालोचनात्मक इतिहास – प्रो0 रामविलास चौधरी

25.07.24

## Psychology

## 401- Social Psychology

**Marks-75 Credits-3**

**Unit-I :** Social Psychology : Nature and Scope, Historical background, Theories – Role, Learning and Cognitive theories. Methods of Study- Experimental, Quasi-experimental, Field study, Survey, Interview and Cross-Cultural method

**Unit-II :** Social Perception : Meaning and determinants. Person perception : Impression formation, determinants, Causal Attribution theory. Attitude: Meaning, components, characteristics, measurement- Thurston, Likert, Semantic Differential. Attitude formation and Change: Persuasion and resistance to change, Theories-Balance and Cognitive Dissonance.

**Unit-III :** Interpersonal Attraction: Meaning, measurement, determinants. Social influence-Conformity, Obedience and Compliance. Aggression and Violence : Influencing factors, Violence in society. Helping and Prosocial Behaviour - Meaning, theories and determinants.

**Unit-IV :** Social group : Meaning, Types, Characteristics – cohesiveness, effectiveness, group dynamics. Leadership- Meaning, types, theories. Intergroup behaviour – Prejudice and Discrimination. Intergroup conflict : causes and methods of resolution.

**Books Recommended :**


- Alcock, J. E. Carment, D.W. Sadava, S.W. Collins, J. E., Green, J. M. (1997). A Text Book of Social Psychology. Scarborough, Ontario: Prentice Hall.
- Baron, R. A. Byrne, D. (2002). Social psychology. New Delhi: Prentice Hall.
- Feldman, R. S. (1985). Social Psychology: Theories, Research and Application. New York: McGraw Hill.
- Myers, David, G (1994). Exploring Social Psychology. New York: McGraw Hill
- सिंह, अरूण कुमार (2003) : सामाजिक मनोविज्ञान की रूपरेखा, मोतीलाल बनारसी दास, वाराणसी
- त्रिपाठी, एल.बी. (2005) : आधुनिक सामाजिक मनोविज्ञान, हर प्रसाद भार्गव, आगरा
- सिंह, आर.एन. (2005) : आधुनिक सामाजिक मनोविज्ञान, द्वितीय संस्करण, अग्रवाल प्रकाशन, आगरा।

**Psychology**
**401- Practical**

**Marks-50 Credits-2**

**(Any 8 of the following 10 practicals)**

(निम्नलिखित 10 में से कोई 8 प्रायोगिक कार्य)

1. Person Perception (व्यक्ति प्रत्यक्षण)
2. Sociometry (समाजमिति)
3. Measurement of attitude (अभिवृत्ति का मापन)
4. Measurement of Social conformity (सामाजिक अनुरूपता का मापन)
5. Study of Caste Prejudice (जाति पूर्वाग्रह का अध्ययन)
6. Measurement of Adjustment (समायोजन का मापन)
7. Measurement of Depression (अवसाद का मापन)
8. Measurement of Anxiety (चिन्ता का मापन)
9. Measurement of Mental Health ( मानसिक स्वास्थ्य का मापन)
10. Measurement of Insecurity (असुरक्षा का मापन)

## Sociology

## Social Change and Social Control

**Marks-100 Credits-4**

**Objectives**

Social change and Social Control have always been a central concern of Sociological study. So far as Social Change is concern, it has gained in salience Partly because of its unprecedented rapidity and partly because of its planned character. The course is designed to achieve all aspect of social change as well as of Social Control.

**Unit-I**: Social Change: Meaning. Nature and factors of Social Change: Biological Factors. Demographic Factors, Technological Factors, Economic Factors Cultural Factors, Info-tech factors.

**Unit-II**: Theories of Social Change: Demographic and Biological Theories: Evolutionary, Diffusionist and Marxist theory, Technological Deterministic Theory, Linear and Cyclical theories of Social change.

**Unit-III**: OTHER CONCEPTS RELATING TO SOCIAL CHANGE: Social process: Industrialization, Urbanization, Mordernization and Sanskritization Social Evolution, Social Change in India

**Unit-IV**: Social Control: Definition, Need and Importance of Social Control, Types of Social Control, Theories of Social control Agencies of Social Control: Family, Propaganda, Public Opinion, Education and State, Religion.

**Essential Reading** :


- Bottommore. T.B. 1972, SOCIOLOGY: A guide to problems and literature.
- Bombay : George Allen and Union (India).
- Gillin and Gillin, Cultural Sociology : The Mac millan and co.New York. 1950.
- Kingsley Davis- Human Society, The Mac millan and co.New York. 1959.
- W.E. Moore, Social Change, Prentice-Hall of India. New Delhi 1965.
- Herbert Spencer; First principles, New York 1906.
- W.F. Ogburn and M.F. Nimkoff: A handbook of Socioloty, Routledge and Kegan Paul Ltd. London 1960.
- MacIver and Page, Society, London 1953.


25.07.24

**Philosophy**
**401- Logic**

**Marks-100 Credits-4**

**Unit-I** : Definition, nature and importance of Logic, Truth and Validity, Induction and deduction, Sentence and Proposition, Kinds of Definition, Informal fallacies, Chief functions of Language.

**Unit-II** : Categorical Proposition, Aristotle's Traditional Square of Opposition and other Immediate Inferences, Existential Import, Categorical Syllogism. Testing Validity and Invalidity of Categorical Syllogisms through Vein Diagram and Laws regarding it.

**Unit-III** : Symbolic Logic, Simple and Compound Propositions, Kinds of Compound Propositions- Negative, Conjunctive, Disjunctive and Implicative Propositions, Testing Validity and Invalidity of Propositions through Truthtable method. Argument- form and Sentence- Form, Kinds of Sentence- Form, Determination of Tautology, Contingent and Contradictoriness through Truth- table Method.

**Unit-IV** : Inductive logic – Scientific Hypothesis, Scientific Explanation, Importance of Science, Methods of Mill for Inductive Generalization.

**Suggested Readings**


- Introduction to Logic : Irving M. Copi
- L.S. Stebbing : A Modern Introduction to logic
- W.V. Quine : Methods of Logic
- Cohen & Nagel : Logic and Scientific Method.
- राम मूर्ति पाठक : तर्कशास्त्र प्रवेशिका
- अविनाश तिवारी : तर्कशास्त्र के सिद्धान्त
- बद्रीनाथ सिंह : तर्कशास्त्र की रुप रेखा
- संगम लाल पाण्डेय : तर्कशास्त्र का परिचय


25.07.24

## History

## 401- History of Modern Europe (1789-1919)

**Marks-100 Credits-4**

**Unit – I**

French Revolution-Causes, Main phases and Consequences.

Emergence of Napolean Bonaparte-Expansion, Consolidation and Downfall.

The Congress of Vienna 1815

Metternich-Forces of Conservation.

**Unit – II**

Making of the National States: Italy and Germany.

Revolutionary movements-1830, 1848 and Europe since 1871-1914.

**Unit – III**

Bismarakian Diplomacy, System of Alliances.

Easterns Question, Power Blocks and Alliances.

First World War-Causes, Expansion and Consequences.

**Unit – IV**

Economic Depression after First World War.

Russian Revolution of 1917-Causes and Effects.

Paris Peace Conference of 1919.

League of Nations-Achievements and Failure.

**Books Recommended**

- History of Modern Times-Hazen
- A Short History of Europe-H.A.L. Fisher
- आधुनिक यूरोप का इतिहास (द्वितीय खण्ड)–लाल बहादुर वर्मा
- आधुनिक यूरोप का इतिहास (द्वितीय खण्ड)–दीनानाथ वर्मा
- आधुनिक यूरोप का इतिहास–पार्थसारथी गुप्ता

25.07.24

**Political Science**
**401- Comparative Government**

**Marks-100 Credits-4**

**Unit – I**

United Kingdom– General Features; Constitutional Conventions; The Crown; Parliament; Cabinet System; The Rule of Law and Judicial System; The Party System.

**Unit – II**

U.S.A.– General Features; Federalism; President; Congress; Federal Judiciary; Method of Amendment of Constitution; Party System.

**Unit – III**

Switzerland– Main Features; Federal Executive; Federal Legislature; Judicial System; Devices of Direct Democracy; Method of Amendment in the Constitution.

**Unit – IV**

China– Social and Economic System, Historical Background and features, Central Executive-President and State Council, Central Legislature– National People's Congress and its Permanent Committee, Judicial System, Communist Party.

**Recommended Books**

- A.C. Kapur: Select Modern
- K.R. Bombwall: Select Constitutions
- J.C. Jauhari: Major Modern Political Systems
- हरिमोहन जैनः तीन संविधान
- पुखराज जैनः विश्व के प्रमुख संविधान

25.07.24

## Economics

### 401- Public Finance and International Trade

**Marks-100 Credits-4**

**Unit – I**

Private and Public Goods, Principle of maximum social advantage Government Budget: Preparation and classification, Sources of Public Revenue, Taxation. Theories of Taxation the benefit approach, the ability to pay approach; incidence and effects of taxation.

**Unit – II**

Public Expenditure: Wagner's law, Wiseman-Peacock hypothesis, the critical limit hypothesis.

Classification of Public Expenditure: Effects of public expenditure on production and distribution. Public Debt: Classification, effects, burden, repayment and management.

**Unit – III**

Fiscal Policy: Stability and Economic growth. Indian Public Finance: Sources of income Central, State, Indian Tax System. Public expenditure in India. Indian Federal Finance.

**Unit – IV**

International Trade: Theory of comparative cost. Refinements-Opportunity cost. Reciprocal demand analysis. Terms of Trade: Concepts and measurement. Free trade and protection. Tariff and non-tariff methods. The balance of payments: Equilibrium and disequilibrium. Foreign trade of India and trade policy.

**Books Recommended:**

- H. Dalton – Public Finance
- H. L. Bhatia - Public Finance
- Alen and Brownley - Public Finance
- Samuelson, P. A. – Economics
- डॉ. जे. पी. मिश्र – लोक वित्त
- डॉ. जे. पी. मिश्र – अन्तर्राष्ट्रीय अर्थशास्त्र
- डॉ. टी. एन. हजेला – राजस्व के सिद्धान्त

25.07.24

## Geography

### 401- Geography of India

**Marks-75 Credits-3**

**Unit-I**

India in the context of Asia and the world : Structure, Relief and Drainage System; Major Physiographic regions of India; The Indian Monsoon-origin and characteristics, effect of El Nino and La Nina, climatic division, Soil types and conservation.

**Unit-II**

Natural vegetation and Forest resources-their utilization and conservation ; Power resources (water, Coal, Mineral oil and Atomic) and Mineral resources (Iron ore, Bauxite, Mica, Manganese) their reserve, distribution, production, trade and conservation. River Valley Projects with special reference to Tehri dam & Narmada Valley project.

**Unit-III**

Indian Economy: Agriculture - main characteristic and problems of Indian agriculture; Irrigation, mechanization and Green Revolution; post revolution scenario-recent trends; Major Agricultural regions. Industries - Location factors; development and spatial pattern of major industries (Iron and Steel, Textiles, Cement, Sugar, Paper, Oil Refinery and Fertilizers) Major Industrial regions/complexes.

**Unit-IV**

Population growth, distribution and density, demographic and occupational structure, Population problems, Literacy, Urbanization with special reference to post-Independence eriod, Population problems. Transport and Trade- Development of Transport Net-work ail and road development and air routes; Foreign trade-salient features, recent trends id trade direction, Major ports and cities.

**nit-V**

egional development & disparities after Independence; Major issues and planning of me problem areas Flood prone areas, Drought prone areas and Tribal areas. Detailed ographical study of Uttar Pradesh.

25.07.24

**Book Recommended**


- Spate, O.H.K. & Learmonth A.T.A. India and Pakistan
- Singh R.L. (ed), India-A Regional Geography, NGSI, Varanasi
- Sen Gupta, P., Economic Regions and Regionalization of India.
- Mitra Ashok, Levels of Economic Development of India.
- Singh, J., India-A Comprehensive Systematic Geography, Gyanodaya Prakashan, Gorakhpur.
- Sharma, T.C. & Countino, O., Economic Geography of India.
- Verma, R.V. Geography of India (Hindi)
- Bansal, S.C., Geography of India (Hindi)
- Gopal Singh, Geography of India
- Ramamurti, Geography of India Systematic.
- Tiwari, R.C., Geography of India, Prayag Pustak Bhawan, Allahabad.
- Nag, P and Sivita Sen Gupta (1992) India, Concept Publishing Co., New, Delhi.


25.07.24

## Geography

## 401- Practical

**Marks-50 Credits-2**

**Lab Work**

**Unit-I: Statistical Analysis** (i) Measures of Central Tendency- Mean, Median, Mode. Measures of Dispersition-Quartile range, Standard Deviation, Variance and Coefficient of variation. Correlation and Co-efficient of correlation.

(ii) Graphial Representation of Statistical Data-Historgram, Polygon, Frequency Curve, Scatter Diagram.

**Unit-II: Cartographic Representation of Statistical Data**

(i) Graphs: Band graph, Hythergraph, Climograph.

(ii) Diagrams: Compound Bar, Wheel, Rectangle, Circle.

(iii) Distribution Maps: Using Dots, Isopleth and Choropleth method.

**Unit-III: Weather Maps** Use of weather instruments and weather symbols (Indian) Study and Interpretation of Indian daily Weather maps/ reports especially of January, March, July and October, Weather forecasting.

**Unit-IV: Geological Maps** Identification of rock-outcrops, bedding planes, Drawing of cross-section and determination of dip and bed thickness-simple and folded.

**(B) Viva-Voce & Sessional Records**

**Division of Marks**

(A) Lab Work: One question from each unit with internal choice, Duration three hours. 40 Marks

(B) Viva-Voce & Sessional Records - 10 Marks

**Books Recommended**

- Monkhouse, F.J. Maps & Diagrams.
- Robinson, A.H., Elements of Cartography.
- Gregory, S., Statistical Method and the Geographer.
- Smith, H.T.V. Aerial Photographs and their Applications.

25.07.24

- Singh, R.L., Elements of Practical Geography.
- Sing, L.R. & Singh, R.N. Map work and practical Geography (Eng./Hindi).
- Sharma, J.P. Prayogatmak Bhoogol Ki Rooprekha (Hindi).
- Hira Lal, Prayogatmak Bhoogol Ke Adhar (Hindi).
- Singh, J. et. al, Bhaumikiya manchitro ki Rooprekha (Hindi).
- Lal, Hira, Matratmak Bhoogol (Hindi).
- Tiwari, R.C. and Tiwari, Sudha, Abhinav Prayogic Bhoogol.

**Pedagogy Related**
**401- Action Research in Education**

**Marks-100 Credits-4**

**Objective** – After taking this course, the student will be able to:

1. Explain the meaning and importance of action research with reference to Indian schools.
2. Use various steps involved in action research in a school.
3. Design and implement school based action research project.
4. Use Action research strategy for improving school practices.

**Content**

**Unit-I:** Meaning and types of research- fundamental, applied and action research, difference between traditional (fundamental and applied) research and action research.

**Unit-II:** Action research for improving class room and school based programmes: Illustrative example in specific areas for use of action research interventions in teaching, learning, co-scholastic areas and organizational climate of a school.

**Unit-III:** Procedure of designing action research: Selection of problem, Formulation of action hypotheses and developing a suitable design for testing of such hypotheses, Evaluation of results in action research and their use.

**Unit-IV:** Developing school based projects for action research; Format of a project and s implementation. Determining intervention based effects in terms of pre-post mparison: Precautions needed. Formulating an action research based report for the nefit of other practitioners.

**signment**

dy on any one environmental problem. The report on the study must include efforts of pupil teacher in developing awareness among people about that environmental blems.

**nsactional Strategies**

course will be transacted through lecture-cum-demonstration sessions with major ment of the course devoted to formulation, implementation and evaluation of action esearch interventions relevant for a secondary school. The course transaction will also include group-discussions, brainstorming and interactive sessions.

25.07.24

**Evaluation**

The course content will be of four (4) credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and rest 20 marks will be credited on the basis of evaluation of sessional work.

**Readings**


- Best, John W. (1998), Research in Education, Prentice Hall of India, New Delhi.
- Cohen, L. and Manion, L.(1980), Research Methods in Education, Croom Helm London.
- Koul, L. (1984), Methodology of Educational Research, Vikas Publishing House, New Delhi.
- Pandey, K. P. (2010), Action Research in Education, Vinod Pustak Mandir, Agra.
- Pandey, K.P. (2008), Fundamental of Educational Research, Vishwavidyalaya Prakashan, Varanasi.

## 402- Environmental Education

**Marks-100 Credits-4**

**Objectives**

The student-teachers will be able to:-

1. Understand the problems of environment and its use.
2. Acquire various skills in training the students about environmental education.

**Contents**

**Unit-I: Information about Environmental Education**

(a) Concept of Environmental Education and Need of Environmental Education.

(b) Objectives of Environmental Education at Secondary School Level.

(c) Methodologies of Environmental Education.

(d) Curriculum Development in Environmental Education.

**Unit-II: Global Environmental Issues**

(a) Components of Environment.

(b) Concept of healthy environment & efforts made in this direction.

(c) Global Environment issues:

i. Conservation of environment: government commitment in national and international fields.

ii. Depletion of ozone layer.

iii. Global warming (greenhouse effect).

**Unit-III: Pollution**

Environmental Pollution: Various types of pollution and strategies for addressing them.

**Unit-IV: Role of Schools and teachers in improving the quality of environment**

(a) What can schools do?

(b) What can teachers do?

(c) What are the various agencies with which schools can collaborate?

(d) Environmental management at micro and macro level.

**Assignment**

Study on any one environmental problem. The report on the study must include efforts of the pupil teacher in developing awareness among people about the concerned environmental problems.

25.07.24

**Transactional Strategies**

The course will be transacted through lecture-cum-demonstration sessions with major segment of the course devoted to formulation, implementation and evaluation of action research interventions relevant for a secondary school. The course transaction will also include group- discussions, brainstorming and interactive sessions.

**Evaluation**

The course content will be of four (4) credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and rest 20 marks will be credited on the basis of evaluation of sessional work.

**Readings**


- Center, E.W. (1977), Environmental Impact Assessment, McGraw Hill Co., New York.
- Fedron, E. (1980), Man and Nature, Progress Publishers, Moscow.
- Gupta, V.K. (1998), Environmental Education, New Academic Publishing House, Jalandhar.
- Kormondy, E. (1991), Concept of Ecology, Prentice Hall of India, New Delhi.
- Odem, E.P. (1975), Ecology, Oxford and IBH Publishing Co., New Delhi.
- Plamer, J. & Philips, N. (1994) The Handbook of Environmental Education, Routledge, London & New York.
- Purdom, P.W. & Anderson, S.H. (1980), Environmental Science, Charles E. Merril Publishing Co., Columbus.
- Pandey, K.P., Bhardwaj and Pandey, Asha (2005), Environmental Education (Hindi), Vishwavidyalaya Prakashan, Varanasi.
- Saxena, A.B. (1966), Education for the Environmental Concerns: Implications and Predices, Radha Publications, New Delhi.
- Sharma, P.D. (1998), Environmental Biology, Rastogi & Co., Meerut.
- Sharma, R.C., & Tan, M.C. (1990), Source Book of Environmental Education for Secondary School Teachers(ed); UNESCO, Bangkok.
- UNESCO (1977), Trends in Environmental Education, UNESCO, Paris.


25.07.24

**SEMESTER-V**

## हिन्दी

## 501– साहित्य सिद्धान्त और आलोचना

Credits-4

अंक–विभाजन : 4 निबन्धात्मक प्रश्न – 4 X 20 = 80 अंक (तीन प्रश्न साहित्य–सिद्धान्त तथा एक प्रश्न हिन्दी–आलोचना से करना अनिवार्य होगा।)

4 लघुउत्तरीय प्रश्न – 4 X 5 = 20 अंक **पूर्णांक : 100**

### प्रथम खण्ड

**1. भारतीय साहित्य सिद्धान्त**

(क) काव्य लक्षण, काव्य हेतु, काव्य प्रयोजन

(ख) शब्द–शक्ति–अभिधा, लक्षणा तथा व्यंजना का लक्षण–उदाहरण सहित सामान्य परिचय।

(ग) काव्य–गुण–माधुर्य, ओज तथा प्रसाद।

(घ) काव्य–दोष–श्रुतिकटु, च्युतसंस्कृति, क्लिष्ट, ग्राम्य, न्यूनपद, अधिकपद, दुष्क्रम, स्वशब्द, वाच्य, पुनरूक्ति तथा अश्लील।

(ङ) रस, अलंकार तथा ध्वनि सम्प्रदाय का सामान्य परिचय।

**2. पाश्चात्य साहित्य–सिद्धान्त–**

(अ) प्लेटो की काव्य सम्बन्धी मान्यता।

(ब) अरस्तू का अनुकरण एवं विरेचन सिद्धान्त।

(स) मार्क्सवादी समीक्षा पद्धति।

(द) शास्त्रवाद और स्वच्छन्दतावाद।

**सहायक ग्रंथ :**

- भारतीय साहित्य शास्त्रकोश – डॉ0 राजवंश सहाय, हीरा
- भारतीय काव्यशास्त्र की भूमिका – डॉ0 नगेन्द्र
- भारतीय काव्यशास्त्र की नयी व्याख्या – डॉ0 राममूर्ति त्रिपाठी
- भारतीय काव्यशास्त्र के सिद्धान्त – डॉ0 जगदीश प्रसाद मिश्र
- पाश्चात्य काव्यशास्त्र – डॉ0 रामपूजन तिवारी

## द्वितीय खण्ड

**हिन्दी आलोचना**

1. आलोचना : स्वरूप एवं प्रकार।
2. आलोचक के प्रमुख गुण।
3. हिन्दी के प्रमुख आलोचकगण
    - (क) आचार्य पं0 रामचन्द्र शुक्ल।
    - (ख) आचार्य पं0 हजारी प्रसाद द्विवेदी।
    - (ग) पं0 नन्ददुलारे वाजपेयी।
    - (घ) डॉ0 रामविलास शर्मा।

**सहायक ग्रंथ :**

- आलोचक और आलोचना – डॉ0 बच्चन सिंह
- रामचन्द्र शुक्ल और हिन्दी आलोचना – डॉ0 रामविलास शर्मा
- हिन्दी प्रत्यालोचना का उदभव और विकास – डॉ0 रामस्वारथ ठाकुर
- हिन्दी समीक्षा : स्वरूप और संदर्भ – डॉ0 रामदरश मिश्र
- हिन्दी में ऐतिहासिक आलोचना (विकास और परम्परा) – डॉ0 विजया त्रिपाठी
- समीक्षा के मानदण्ड और हिन्दी समीक्षा की विशिष्ट प्रवृत्तियाँ – डॉ0 प्रताप नारायण टण्डन
- हिन्दी आलोचना की आधुनिक प्रवृत्तियाँ और उन पर पाश्चात्य प्रभाव –डॉ0 शंकर लाल गुप्ता
- शुक्लोत्तर हिन्दी आलोचना (नव्य हिन्दी समीक्षा) – डॉ0 कृष्णवल्लभ जोशी
- शुक्लोत्तर काव्य–चिन्तन – डॉ0 श्यामबिहारी राय
- शुक्लपूर्व आधुनिक हिन्दी आलोचना – डॉ0 मंगला प्रसाद सिंह
- आधुनिक हिन्दी आलोचना – डॉ0 मक्खनलाल शर्मा
- आधुनिक हिन्दी साहित्य में आलोचना का विकास – डॉ0 वेंकट शर्मा
- आधुनिक हिन्दी साहित्य में आलोचना का विकास – डॉ0 रामकिशोर कक्कड़
- आधुनिक हिदी आलोचना – डॉ0 हरिमोहन मिश्र
- आचार्य रामचन्द्र शुक्ल के साहित्य सिद्धान्त – डॉ0 रामकृपाल पाण्डेय
- आचार्य रामचन्द्र शुक्ल के समीक्षा सिद्धान्त – डॉ0 रामलाल सिंह
- नगेन्द्र की सैद्धान्तिक एवं व्यावहारिक समीक्षा – एस0 लक्ष्मी
- पं0 महावीर प्रसाद द्विवेदी का समीक्षा साहित्य – रामशंकर शर्मा

## English Literature

## 501- History of English Literature

**Marks-100 Credits-4**

**Unit-I :** Ten short-answer questions based on the entire course.

**Unit-II :** From Renaissance to Seventeenth Century

Renaissance and Reformation

Miracle and Morality Plays

University Wits

Authorised version of the Bible

Metaphysical Poetry

Neo-classicism

Elizabethan Songs and Sonnets

**Unit-III :** Eighteenth Century and the Romantic Age

Growth of the Novel

Precursors of Romanticism

Romanticism and the French Revolution

Growth of Romantic Literature (Prose, Poetry, Drama and Novel)

**Unit-IV:** Nineteenth Century

Characteristics of Victorianism

Growth of Victorian Literature (Prose, Poetry, Drama and Novel)

Pre-Raphaelite Poetry

Naughty Nineties.

**Unit-V :** The Twentieth and Twenty-first centuries

Trends in twentieth century literature with special reference to

Georgian poetry, Imagism and Symbolism, Movement Poetry.

Twentieth Century Novel

Twentieth Century Drama, Problem Play, Theatre of the Absurd,

Expressionism, Epic Theatre.

Growth of Postcolonial literature: Feminism, Post modernism etc.

Q No. 1. Ten Short Answer questions based on the entire course. 20 Marks

Q No.2-5 One Long Answer question from each unit 4x20= 80 Marks

25.07.2018

## संस्कृत
## 501– काव्य

पूर्णांक–100 Credits- 4

| | | | |
|---|---|---|---|
| इकाई (i) | – शिशुपालवधम् | प्रथम सर्ग–श्लोक 1–35 | 30 |
| इकाई (ii) | – शिशुपालवधम् | प्रथम सर्ग–श्लोक 36–75 | 30 |
| इकाई (iii) | – शिवराजविजयः | प्रथम निःश्वास | 40 |

संस्तुत ग्रन्थः

- शिशुपालवधम् – डॉ0 आद्याप्रसाद मिश्र
- शिशुपालवधम् – डॉ0 केशवराम मुसलगॉवकर
- शिशुपालवधम् – डॉ0 शिवबालक द्विवेदी
- शिवराजविजयः – डॉ0 श्रीनिवास ओझा
- शिवराजविजयः – प्रो0 ओमप्रकाश पाण्डेय

25.07.24

## Psychology

### 501- Psychological Assessment and Statistics

**Marks-75 Credits-3**

**Unit-I:** Scaling techniques and Measurement: Scaling techniques: Paired comparison, Rating and Ranking. Levels of Measurement: Nominal, interval, ordinal and ratio scales. Tests: Meaning and characteristics. Types of tests.

**Unit-II:** Nature of psychological data. Categorical and continuous variables. Application of statistics in psychology. Frequency Distribution : Drawing of frequency distribution, Graphical representation of data. Measures of Central Tendency: Characteristics and computation of Mean, Median and Mode. Measures of Variability: Range and Semi interquartile range, Standard deviation and Variance

**Unit-III:** Normal Distribution: Concept of probability, Characteristics of Normal Probability Curve, Deviations from Normal Probability Curve (NPC)–Skewness and kurtosis. Normalization of skewed distributions, Applications of NPC. Correlation: The concept of correlation. Linear and nonlinear correlation. Product moment correlation, Rank order correlation, Biserial and Point-biserial correlation.

**Unit-IV:** Standard error of mean, standard deviation and correlation, Nature and assumption of t- distribution, Computation of t-values for independent and dependent samples, Interpretation of t-values, level of significance, Type-I and Type-II errors in inference making. Chi square Test, Purpose and assumptions of Analysis of Variance (ANOVA): One-way analysis of variance.

**Books Recommended**


- Broota, K.D. (1992) Experimental Design in Behavioural Research, New Delhi, Wiley Eastern, Delhi
- Minium, E.W., King, B.M. & Bear, G. (1993). Statistical Reasoning in Psychology and Education, New York: John Wiley.
- Garrette, H.E. (1996). Statistics in Psychology and Education. Vakils, Feffer and Simons Ltd., Bombay
- मिश्रा, बी. एवं त्रिपाठी, एल.बी. (1990) : मनोवैज्ञानिक सांख्यिकी, हर प्रसाद भार्गव, आगरा।
- कपिल, एच.के: (2006) : सांख्यिकी के मूल तत्व, मोतीलाल बनारसी दास, वाराणसी।
- सिंह, राजवीर एवं राधेश्याम (2007) व्यवहार विज्ञानों के लिए वृहद सांख्यिकीय, सजय प्रकाशन, दिल्ली.
- भाटिया, आर.एस. (2007) आधुनिक मनोवैज्ञानिक सांख्यिकी, लावण्य प्रकाशन, उरई.

## Sociology

## 501- Foundations of Sociological Thought Marks-100 Credits-4

**Objectives**

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two century since then has been influenced by a variety of socio-economic and political conditions where it has been taught and practiced. It is know established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized, Nevertheless, some of its original concerns have persisted and some of its classical theoretical and methodological landmarks are relevant even now. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. Its objective is to help students gain an understanding of some of the classical contributions in sociology and their continuing relevance to its contemporary concerns.

**Course Outlines**

**Unit-I: The Emergence of sociology**: Transition from social philosophy to sociology- The intellectual context. Enlightenment- The social, economic and political forces : The French and Industrial Revolutions.

**Unit-II: Sociological Concepts:** Sociological concepts and facts, Relation between concept and theory, Social system, Social structure

**Unit-III: The pioneers Comte:** positivism- Spencer: Social Darwinism superorganic evolution. The classical tradition: Durkheim: social solidarity, and suicide- Weber: authority and the concept of ideal type- Marx:materialist conception of History, Dialectical Materialism, and class struggle – Pareto: circulation of elites.

**Unit-IV: Development of Sociological Thought in India:** Indian Social Thought. Indiological Approach. Vedic Tradition. Shraman Tradition (Buddhism and Jainism). Indian Renaissance- Raja Ram Mohan Roy, Swami Dayanand Saraswati, Swami Vivekanand, Mahatma Gandhi.

25.07.24

**Essential readings**


- Aron, Ramond. 1967(1982 reprint). Main currents in sociological thoughts (2 columes). Harmondsworth, Middlesex: Penguin Books.
- Barnes, H.E. 1959. Introduction to the history to the sociology. Chicago The University of Chicago press.
- Coser, Lewis A. 1979. Masters of Sociological Thought. New York : Harcourt Brance Jovanovich
- Fletcher, Ronald. 1994.The Making of Sociology (2 volumes) Jaipur-Rawat.
- Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage.
- Ritzer, George. 1996. Sociological Theory. New Delhi. Tata-McGraw Hill.
- Singh, Yogendra. 1986 Indian Sociology: social conditioning and emerging Trends. New Delhi: Vistaar.
- Zeitlin, Irving.1998 (Indian Edition). Rethiking sociology: A critique of Contemporary Theory. Jiapur: Rawat.
- Pandey, Ravi Prakash, 2009. (Hindi Edition). Sociological Theories: Approach & Perspective, Allahabad, Shekhar Prakashan.
- Pandey, Ravi Prakash, 2010 (Hindi Vth Edition). Indian Social Thought, Allahabad, Shekhar Prakashan.


25.07.24

**Philosophy**

**501- Problems of Philosophy (Indian &Western)**

**Marks-100 Credits-4**

**Unit-I:** Nature of Knowledge, Prama, Praman, Pramcya & Pramaryavad, Theories of causation- Satkaryavad, Asatkaryavad, Parinamvad Vivartvad &Pratitysamutpad.

**Unit-II:** Theories regarding soul; Bhutachaitanyavad Anatmvad, Anekatmvad & Ekatmvad, Theories regarding reality Monism Dualism & Pluralism

**Unit-III:** Nature of Knowledge – Plato, Rationalism, Empiricism, & Criticism, Theories of Causation– Aristotle, Hume & Kant, Theories of Truth– Correspondence theory, Coherence Theory and Pragmatism.

**Unit-IV:** Creationism & Evolutionism, Creative evolutionism and Emergent evolutionism, Problem of Universal-Realism, Conceptualism & Nominalism, Problem of space & Time – Leibnitz & Kant.

**Suggested Reading**


- A.C. Eving : Some Fundamental questions of Philosophy
- A.D. Woozley : Theory of Knowledge
- H.M. Bhattacharya : Principles of Philosophy
- B. Russell : Problems of Metaphysics
- Machinen : Problems of Metaphysics
- A.J. Ayer : The Central Questions of Philosophy
- R.K. Tripathi : Problems of Philosophy and Religion
- K.C. Raja : Some Fundamental Problems of Indian Philosophy
- S.C. Chatterji : Nyaya Theory of Knowledge
- D.M. Datta : Six Ways of Knowing
- Radhakrishnan : Indian Philosophy Vol. I & II
- S.K. Maitra : Fundamental Questions of Indian Metaphysics & Logic
- राजेन्द्र प्रसाद : दर्शन की रुप रेखा
- हरिशंकर उपाध्याय : ज्ञानमीमांसा के मूल प्रश्न
- केदार नाथ तिवारी : तत्त्वमीमांसा एवं ज्ञानमीमांसा


25.07.24

- अशोक कुमार वर्मा : तत्त्वमीमांसा एवं ज्ञानमीमांसा
- बी०एन०सिंह : पाश्चात्य दर्शन की समस्याएँ एवं समकालीन दर्शन
- बी०एन०सिंह : प्रमाण परिचय
- वद्रीनाथ शुक्ल : तर्कभाषा (हिन्दी अनुवाद)
- डी० वंदिष्टे : भारतीय दार्शनिक निबन्ध
- नन्द किशोर शर्मा : भारतीय दर्शन की समस्याएँ
- गीता रानी अग्रवाल : भारतीय ज्ञान मीमांसा
- वशिष्ट नारायण सिन्हा : भारतीय दर्शन की समस्याएँ
- डॉ0 हृदय नारायण मिश्र पाश्चात्य दर्शन

## History

### 501- Indian National Movement (1857-1947)

**Marks-100 Credits-4**

**Unit-I**

Revolt of 1857-Causes, Nature, Failure and Aftermath.

Birth of Nationaslism.

Foundation of Indian National Congress.

Policies of Indian National Congress from 1885-1905.

Extremism-Ideas, Means and Movement.

**Unit-II**

Partition of Bengal and Swadeshi Movement.

Revolutionary Movement-Causes of its emergence and main activities in India.

Ghadar Party-Formation and Activities.

Hindustan Socialist Republican Association-Bhagat Singh and Batukeshwar Dutt.

Subhash Chandra Bose and Azad Hind Fauj.

**Unit-III**

Home Rule movement and Khilafat movement.

Gandhian Era.

Non-Co-Operation movement.

Simon Commission and Nehru Report.

Civil-Disobedience movement.

**Unit-IV**

Quit-India movement.

Rise of Communalism.

Partition of India.

**Books Recommended**

- History of Freedom Movement Vol-I, II, III-Dr. Tarachand.
- History of the Freedom Movement in India-R.C. Majumdar
- भारत का मुक्ति संग्राम–अयोध्या सिंह
- भारत का राष्ट्रीय आन्दोलन–इकबाल नारायण
- भारतीय स्वतन्त्रता संग्राम–शैलेन्द्र पान्थरी

25.07.24

## Political Science
## 501- Principles of Public Administration

**Marks-100 Credits-4**

**Unit- I:** Meaning, Nature and Scope of Public Administration, Relation of Public Administration to other Social Sciences; Public and Private Administration; The Role of Public Administration in the Modern State; Responsive Administration.

**Unit-II:** Bases of Organization–Primacy of the Functional base; Principles of Organization; Hierarchy; Span of Control; Delegation of Authority; Centralization and decentralization; Control over Administration; Legislative, Executive and Judicial

**Unit-III:** The Chief Executive; Line, Staff and Auxiliary Agency; The Department; Public Corporation; Independent Regulatory Commission; Field Service agencies; Bureaucracy

**Init-IV:** Personnel Administration: Recruitment, Training and Promotion; Position lassification; Public Relations; Financial Administration; Budget Audit

**commended Books**

- अवस्थी एवं माहेश्वरी : लोक प्रशासन (अंग्रेजी में भी उपलब्ध)
- सी0पी0 भाम्भरी : लोक प्रशासन के सिद्धान्त (अंग्रेजी में भी उपलब्ध)
- इन्द्रजीत कौर : लोक प्रशासन– नए आयाम
- बी0एल0 फाड़िया : लोक प्रशासन

25.07.24

## Economics

### 501- Economics of the Less Developed Countries

**Marks-100 Credits-4**

**Unit-I: Economic growth and economic development:** Meaning measurement and distinction; Diverse structure and common characteristics of developing nations; obstacles to development, economic and non-economic factors in economic development, Patterns of resource endowments agricultural, Mineral energy.

**Unit-II: Analytical perceptions of problems and policies:** Vicious circles of poverty; Dualistic economic theories, Lewis model of labour surplus economy, Rosenstein Rodan's theory of big push, Leibestein's critical minimum effort thesis, Nelson's level equilibrium trap; balanced versus unbalanced, Rostow's stages in theory of growth, poverty and inequality and unemployment.

**Unit-III: Towards an equitable world economy:** Trade and Economic development; Terms of trade, concepts, measurement, movements and prospects, international finance and financial restructuring, south-south cooperation, W.T.O. and development countries.

**Unit-IV: Development and planning:** need, concept, types, planning and the market, Formulation of plans. Objectives, strategy, Plan models, Mahalanobis model, Financing and achievements of Indian Five Year Plans.

**Books Recommended:**

- Todaro, M. P. – Economic Development in the Third World
- Thirlwal, A. P. – Growth and Development
- Ghatak, S. – Development Economics
- Meier, G. M. (Eds.) – Leading Issues in Economic Development
- Salvatore, D and E. Dowling - Development Economics, Schaum, Outline series in Economics
- Agarwala, A. N. and S. P. Singh (Eds.) – Economics of Under-development
- डॉ. जे. पी. मिश्र – संवृद्धि एवं विकास का अर्थशास्त्र
- डॉ. जे. पी. मिश्र – अल्प विकसित देशों का अर्थशास्त्र
- डॉ. एम. एल. झिंगन – विकास का अर्थशास्त्र एवं आयोजन

## Geography

## 501- Geographical Thought

**Marks-75 Credits-3**

**Unit-I:** The field of geography; its place in the classification of sciences; geography as a selected concepts of geography-distributions; relationships, interactions, area differentiation and spatial organization.

**Unit-II:** Dualisms in geography; systematic & Regional geography; physical & human geography. Systematic geography & its relation with systematic sciences and with regional geography. The myth and reality about dualisms.

**Unit-III:** Geography in ancient period- Contribution of Indian, Greek & Roman geographers Geography in middleage- Arab geographers, Renaissance period in Europe. Renowned travellers and their geographical discoveries.

**Unit-IV:** German school of thought- Kant, Humboldt, Ritter, Richthofen, Ratzel, Hettner. French school of thought - Contribution of Blache & Brunhes.

**Unit-V:** Soviet geographers, American school- Contribution of Davis, Sample, Hunthington & Carl Sauer. British school- Contribution of Mackinder, Herbertson & L.D. Stamp.

**Books Recommended**


- Abler, Ronald; Adams, John S. Gould Peter: Spatial Organization: The Geographers View of the World, Prentice Hall, N.J. 1971.
- Ali S.M. : The Geography of Puranas, Peoples Publishing House, Delhi, 1966.
- Amedeo, Douglas: An introduction to Scientific Reasoning in Geography, John Wiley, U.S.A. 1971.
- Dikshit, R.D. (ed.) The Art & Science of Geography Integrated Readings, Prentice Hall of India, New Delhi-1994.
- Hartshorne, R: Perspective on Nature of Geography, Rand McNally & Co. 1959.
- Husain, M.: Evolution of Geographic Thought, Rawat Pub.: Jaipur. 1984.
- Johnston, R.J.: Philosophy and Human Geography, Edward Arnold London, 1983.
- Johnston, R.J.: The Future of Geography, Mehtuen, London, 1988.
- Minshull R.: The Changing Nature of Geography, Hutchinson University Library, London, 1970


25.07.24

## Pedagogy Related

## 501- Educational Technology

**Marks-100 Credits-4**

**Objectives**

The student teachers will be able to:-

1. Develop a total perspective of the role of technology and information science in modern educational practices.
2. Make various technological applications available for improving instructional practices.
3. Acquire knowledge about different aspects of teaching and communication process.
4. Acquire information about innovation in Educational Technology.
5. Learn skills required for effective instruction.

**Contents**

**Unit-I: Concept of Educational Technology and Information Technology**

(a) Concept, Nature and Scope of Educational Technology; Difference between Technology in Education and Technology of Education

(b) Approaches of Educational Technology- Hardware, Software and System Approach.

(c) Applications of Educational Technology in improving theory and practices of education.

(d) Concept and significance of Information Technology.

(e) Different types of network: LAN, WAN, E- mail, Internet and World Wide Web.

**Unit-II: Teaching and Communication Technology**

(a) Meaning, principles, levels and phases of teaching.

(b) Concept, process, principles and barriers of communication.

(c) Classroom Communication (Verbal and Non- Verbal).

(d) Systematic observation of classroom interaction; FIAC- encoding and decoding procedures.

25.07.24

**Unit-III: Models of Teaching & Instructional Strategies**

(a) Concept, elements and needs of a teaching model.

(b) Classification of Teaching Models, Glaser's basic teaching model, Bruner's concept attainment model.

(c) Instructional Strategies- Group discussion, Brainstorming, Tutorial and Role Playing.

**Unit-IV: Innovation in Educational Technology and Modification of Teaching Behavior**

(a) CAI, Teleconferencing and Language Laboratory.

(b) Microteaching and Simulation.

(c) Programmed learning: psychological basis, principles and types- linear, branching and mathematics.

**Assignment**

Preparation of a linear or branching type of programming as instructional material in the relevant teaching subject.

**Transactional Strategies**

The course content will be implemented through lectures, discussions, laboratory sessions, demonstrations and multimedia presentations.

**Evaluation**

The course content will be of 4 credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and rest 20 marks will be awarded on the basis of sessional work.

**Readings**


- Aian Cleary (1976), Educational Technology, Wiley & Sons, New Delhi.
- Antani, H. (1997), Internet for Beginners, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Bruce, Joyce and Marsha Weil (1992), Models of Teaching, Prentice Hall of India, New Delhi.


25.07.20

- Curtin (1998), Information Technology in the Breaking Wave, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Hota (1996), Communications, IGNOU, New Delhi.
- Jain, V.K. (1997), Information Technology, BPB Publication, New Delhi.
- Kumar, A and S.Goswami (1996), The Information Society, IGNOU, New Delhi.
- Leon, Mathews (1996), Internet for Everyone, Leon Teach Work Publication, Chennai.
- Oshea T. and Selt J. (1983), Learning and Teaching with Computers, The Harvest Press, Sussex.
- Rao, V.K. (2005), Instructional Technology, A.P.H. Publishing, New Delhi.
- Rojers, William (1984), Communication in Action, Rinehart and Winston, Holt.
- Sinha, P.K.(1998), Computer Fundamentals, BPB Publications, New Delhi.
- Yogendra K. Sharma (2004), Fundamental Aspect of Educational Technology, Kanishka Publishers, New Delhi.
- Pandey, K.P.(2007), A First Course in Instructional Technology, Amitash Prakashan, Delhi.
- Pandey, K.P. (2007), Technology of Programmed Instruction, Amitash Prakashan, Delhi.


25.07.24

**SEMESTER-VI**

## हिन्दी
## 601– भाषा विज्ञान एवं हिन्दी भाषा

**Credits-4**

अंक विभाजन, 4 निबन्धात्मक प्रश्न – 4 X 20 = 80 अंक

4 लघुत्तरीय प्रश्न – 4 X 5 = 20 अंक **पूर्णांक–100**

**पाठ्य–विषय :**

1. भाषा विज्ञान : सामान्य परिचय (क) भाषा विज्ञान के अंग (ख) विषय–क्षेत्र (ग) अध्ययन की पद्धतियाँ।
2. भाषा : (क) भाषा का स्वरूप (ख) भाषा की उत्पत्ति (ग) भाषा की प्रवृत्ति एवं विशेषताएँ (घ) भाषा, विभाषा और बोली।
3. ध्वनि विज्ञान : (क) हिन्दी ध्वनियों का सामान्य परिचय (ख) ध्वनि–परिवर्तन की दिशाएँ।
4. रूप विज्ञान : अर्थतत्व तथा सम्बन्धतत्व का परिचय, प्रकार और संयोग।
5. अर्थविज्ञान : सामान्य परिचय : (क) अर्थ का तात्पर्य और महत्त्व (ख) शब्द और अर्थ का सम्बन्ध (ग) अर्थ–परिवर्तन की दिशाएँ एवं कारण।
6. भारतीय आर्य भाषा परिवार : प्राचीन मध्यकालीन और आधुनिक भारतीय आर्यभाषा का सामान्य परिचय।
7. हिन्दी : (क) हिन्दी शब्द की व्युत्पत्ति, (ख) हिन्दी का क्षेत्र–विस्तार, (ग) हिन्दी भाषा का विकास. (सामान्य परिचय)।
8. हिन्दी की प्रमुख बोलियाँ : खड़ी बोली, ब्रज, अवधी तथा भोजपुरी का सामान्य परिचय।
9. हिन्दी भाषा के विभिन्न रूप : राष्ट्रभाषा, राजभाषा, सम्पर्कभाषा।
10. हिन्दी–शब्द–भण्डार : तत्सम, तदभव, देशज तथा आगत शब्द।
11. देवनागरी लिपि : (क) उद्भव और विकास (ख) गुण–दोष (ग) सुधार के प्रयत्न।

**सहायक ग्रंथ :**

- भाषा विज्ञान – डॉ० भोलानाथ तिवारी
- हिन्दी भाषा – डॉ० भोलानाथ तिवारी
- भाषा विज्ञान की भूमिका – डॉ० देवेन्द्रनाथ शर्मा
- भाषाशास्त्र की रूपरेखा – डॉ० उदयनारायण तिवारी
- हिन्दी भाषा और नागरी लिपि – डॉ० देवेन्द्रनाथ शर्मा
- सामान्य भाषा विज्ञान – डॉ० बाबूराम सक्सेना
- भाषा विज्ञान – डॉ० कर्ण सिंह
- भाषा विज्ञान व हिन्दी भाषा की भूमिका – डॉ० त्रिलोचन पाण्डेय

25.07.24

**English Literature**
**601- Indian English Literature**

**Marks-100 Credits-4**

**Unit-I:** Ten short answer questions based on the entire course including three passages for explanation

**Unit-II: Poetry**

| | |
|---|---|
| NissimEzkiel | 'A Poem of Dedication' |
| JayantMahapatra | 'A Country' |
| R.N. Tagore | 'Song Nos10 &11 from *Gitanjali*' |
| A K Ramanujan | 'A River' |
| Keki N Daruwala | 'The Unrest of Desire' |

**Unit-III: Drama**

| | |
|---|---|
| Mahesh Duttani | Seven Steps around the Fire |

**Unit-IV: Fiction**

| | |
|---|---|
| Mulk Raj Anand | The Untouchable |

**Unit-V: Prose**

| | |
|---|---|
| JawaharLal Nehru | 'The Early Civilizations' from *Letters from a father to His Daughter* |

Q.No.1. Ten short answer questions based on the entire course including three passages for explanation.

Q No,2-5. One Long answer question from each unit (Unit II to V)

## संस्कृत

### 601–काव्यशास्त्र, व्याकरण एवं निबन्ध

पूर्णांक–100 Credits- 4

| | | | |
|---|---|---|---|
| इकाई (i) | – साहित्यदर्पण के आधार पर अधोलिखित का परिचय– काव्यलक्षण, काव्यप्रयोजन, शब्दशक्ति, गुण तथा रस। | | 40 |
| इकाई (ii) | – लघुसिद्धान्तकौमुदी | पूर्वकृदन्त, उत्तरकृदन्त | 30 |
| इकाई (iii) | – लघुसिद्धान्तकौमुदी | तद्धित एवं स्त्री प्रत्यय (तद्धित में अपत्याधिकार एवं शैषिक् तथा स्त्री प्रत्यय में ङीप, टाप्) | 20 |
| इकाई (iv) | – संस्कृत निबन्ध | | 10 |

संस्तुत ग्रन्थ

- साहित्यदर्पणः – डॉ0 निरूपण विद्यालंकार
- साहित्यदर्पणः – डॉ0 शालग्राम शास्त्री
- साहित्यदर्पणः – प्रो0 सत्यव्रत सिंह
- संस्कृत आलोचना – पं0 बलदेव उपाध्याय
- लघुसिद्धान्तकौमुदी – पं0 श्री धरानन्द शास्त्री
- संस्कृत निबन्ध मकरन्दः – डॉ0 कृष्णदत्त मिश्र एवं डॉ0 विजय शंकर पाण्डेय
- संस्कृत निबन्ध मंजरी – डॉ0 शिवप्रसाद शर्मा

25.07.24

## Psychology
## 601- Systems of Psychology

**Marks-75 Credits-3**

**Unit-I:** Development of Psychology: Contribution of Weber, Fechner, Helmholtz, Galton, William James and Cattell.

**Unit-II:** Structuralism: Contribution of Wundt and Titchner, Criticism of Structuralism. Functionalism: Chicago school- Contribution of John Dewy, Angell, Carr. Columbia school: Contribution of Thorndike and Woodworth. Criticism of functionalism, Difference between structuralism and functionalism.

**Unit-III:** Behaviourism : Watson's behaviorsim - Characteristics and evaluation. Gestalt psychology: Gestalt psychology as a school, Elements of Gestalt theory- Perception, learning and thinking.

**Unit-IV:** Psychoanalysis: Freudian contribution- Theory of mind, Repression, Dream theory, Theory of Instinct. Stages of Psychosexual development, Defence mechanism. Adler's individual psychology, Jung's collective unconscious. Levin's Field theory, Maslow's Hierarchy of needs.

**Books Recommended :**


- Singh, A.K. (1991): The Comprehensive History of Psychology, Motilal Banarasi Das, Delhi.
- Wolman, B.B. (1979): Contemporary Therories and Systems in Psychology, Delhi, Freeman Book Co.
- Marx, M.H. & Hillix, W.A.C. (1989): Systems and theories in Psychology, New York: Mc raw-Hill.
- सिंह, ए.के. एवं सिंह, ए.के. (2006): मनोविज्ञान के सम्प्रदाय एवं इतिहास, मोतीलाल बनारसी दास, दिल्ली।
- शर्मा, ए.के. (2002): मनोवैज्ञानिक विचारधारायें, भार्गव बुक हाउस, आगरा।
- अजीमुर्रहमान एवं अशरफ, जावेद (2004): मनोविज्ञान का संक्षिप्त इतिहास, मोतीलाल बनारसी दास, दिल्ली।


25.07.24

## Psychology
## 601- Practical

**Marks-50 Credits-2**

**(Any 8 of the following 10 practicals)**

(निम्नलिखित 10 में से कोई 8 प्रायोगिक कार्य)

1. Paired-comparison method of scaling (मापन की युग्मित–तुलना विधि)
2. Rank order method of scaling (मापन की कोटि क्रम विधि)
3. Rating Scale (क्रमिक मापनी)
4. Measurement of stress (प्रतिबल का मापन)
5. Measurement of Job satisfaction (कार्य–तोष का मापन)
6. Measurement of Coping Strategies (प्रवरण युक्तियों का मापन)
7. Measurement of Aptitude (अभिक्षमता का मापन)
8. Measurement of Intelligence (बुद्धि का मापन)
9. Measurement of Achievement (उपलब्धि का मापन)
10. Measurement of Interest (रूचि का मापन)

25.07.24

## Sociology
## 601- Social Research Methods

**Marks-100 Credits-4**

**Objectives:**

This course aims to provide an understanding of the nature of social Phenomena, the issues involved in social research and the ways and means of understanding and studying social reality.

Thus the emphasis is there on the study of research method as a means of understanding social reality. There are different perspectives and methods (both quantitative and qualitative research) are to be covered.

**Course outline:**

**Unit-I:** Meaning, scope and significance of social research. Conceptualization and and formulation of hypothesis.

**Unit-II**: scientific Study of social Phenomena. The scientific method, logic in social Science. Objectively and subjectivity in social science. Positivism and Phenomenology.

**Unit-III**: Methods of Research : Quantitative- Social Survey and qualitative methods, - observation, case study, content analysis.

**Unit-IV**: Types of Research- basic and applied, historical and empirical, Descriptive, exploratory, explanatory experimental.

**Unit-V:** Techniques of Data Collection:- Sampling techniques, Questionnaire, schedule and interview guide, primary and secondary data.

**Unit-VI:** Classification and presentation of data coding, tables, graphs, Measures of central tendency: Mean, Median, Mode, Standard Deviation.

**Essential Readings:**


- Bajaj and Gupta. 1972, Elements of Statistics. New Delhi: R.Chand and Co.
- Beteille, A. and T.N. Madan.1975, Encounter and experience: Personal Accounts of Fieldwork. New Delhi: Vikas Publishing House.
- Bryman, Alan. 1988 Quality and Quantity in Social Research, London: Unwin Hyman.
- Garrett, Henry. 1981 Statistics in Psychology and Education. David Mckay. Indian Publication-Mrs. A.F.Sheikh for Vakils, Bombay. Tenth Reprint.


25.07.24

- Jayram, N.1989. Sociology: Methods and Theory. Madras: MacMillan.
- Kothari, C.R.1989. Research Methodology: Methods and Techniques, Bangalore, Wiley Eastern.
- Punch, Keith. 1996. Introduction to Social Research, London: Sage.
- Shipmen, Martin. 1988. The Limitations of Social Research.London Sage.
- Srinivas, M.N. and A.M.Shah 1979. Fieldworker : The Field, Delhi Oxford.
- Young, P.V. 1988. Scientific Social Survey and Research. New Delhi: Prentice Hall.

## Philosophy

### 601- Philosophy of Religion

**Marks-100 Credits-4**

**Unit-I:** Definition and Nature of Philosophy of Religion. It's Relation to 'Dharma' and Philosophy, Definition and nature of 'Dharma' and its relation to science.

**Unit-II:** Nature of Religious Consciousness- Origin of the Religious Consciousness- Knowledge, Emotion and Will, Basis of Religious Belief: Reason, Faith, Belief, Revelation.

**Unit-III:** Nature of God and attributes Various Ideas of God- Deism, Pantheism, Panentheism, Theism. Proofs for the existence of God: Ontological, Causal, Teleological and Moral proofs.

**Unit-IV:** Problems of Evil and its solutions. Atheism and its Kinds, Immortality of Soul and it's Importance for Religion. Thoughts of Vivekananda, Gandhi, Bhagwandas and Radhakrishnan about unity of Religions.

**Suggested Reading**


- John Hick : Philosophy of Religion
- D.M. Edwards : The Philosophy of Religion
- Radhakrishnan : Eastern Religion and Western Thought
- G. Galloway : The philosophy of Religion
- John Caird : An Introduction to Philosophy of Religion
- E.S. Brightman : Philosophy of Religion
- Wright : A Student's Philosophy of Religion
- हरेन्द्र प्रसाद सिन्हा : धर्म दर्शन की रुपरेखा
- बी०एन०सिंह : धर्म दर्शन
- वेद प्रकाश वर्मा : धर्म दर्शन के मूल तत्त्व
- याकूब मसीह : सामान्य धर्म दर्शन
- दुर्गादत्त पाण्डेय : धर्मदर्शन का सर्वेक्षण
- शिवभानु सिंह : धर्म दर्शन का आलोचनात्मक अध्ययन
- लक्ष्मी निधि शर्मा : धर्म दर्शन
- हृदय नारायण मिश्र धर्म दर्शन


25.07.24

## History

### 601- Cultural and Economic History of India (1206-1900)

**Marks-100 Credits-4**

**Unit-I**

Bhakti movement-Causes of its emergence, main principles, prominent Saints of Bhakti movement-Kabir, Nanak, Chaitanya, Tulsi Das.

Sufism-Origin, Concept and Practices.

Society in Sultanate and Mughal India.

**Unit-II**

Economic policy of Allauddin Khilji.

Land Revenue system under Sher Shah and Akbar.

Mahalwari and Rayyatwari System.

Permanent Settlement of Cornwallis in Bengal.

**Unit-III**

Renaissance in 19th Century.

Ram Mohan Roy and Brahmo Samaj.

Dayanand Saraswati and Arya Samaj.

Ram Krishna Paramhansa and Swami Vivekanand.

**Unit-IV**

Mughal Industries and Foreign Trade.

East India Company's Trade from 1757 to 1833.

Zamindari System in Mughal Empire.

Development of Railways in 19th Century.

Transport in India (1556-1900).

**Books Recommended**

- Some Aspect of Religion and Society during the Mughal Period-R.P. Tripathi.
- Life and Condition of the pepole of Hindustan-K.M. Ashraf.
- Religion and Politics in 13th Century-Prof. Nizami.
- भारत का सामाजिक, सांस्कृतिक, आर्थिक इतिहास, खण्ड–I, II पुरी, चोपड़ा, दास
- भारत का सामाजिक, आर्थिक इतिहास–प्रो0 अशोक कुमार श्रीवास्तव
- मध्यकालीन भारतीय संस्कृति–डॉ0 लईक अहमद
- 18वीं सदी के जमींदार–प्रो0 एस0एस0आर0 रिजवी
- मध्यकालीन भारतीय संस्कृति–आशीर्वादी लाल

25.07.24

**Political Science**
**601- Indian Political Thought**

**Marks-100 Credits-4**

**Unit-I**

Main Features of Ancient Indian Political Thought; Manu; Kautilya; Bhishma

**Unit-II**

The Indian Renaissance; Raja Ram Mohan Roy; Dayanand Saraswati; Swami Vivekanand

**Unit-III**

Gopal Krishna Gokhale; Bal Gangadhar Tilak; Arvindo Ghosh; Mahatma Gandhi

**Unit-IV**

Dr. Bhimrao Ram Ji Ambedkar; Jawahar Lal Nehru; M.N. Roy; Acharya Narendra Deo; Jai Prakash Narayan

**Recommended Books**

- V.R. Mehta: Indian Political Thought
- V.P. Verma: Modern Indian Political Thought (हिन्दी में भी उपलब्ध)
- Donald Bishap: Thinkers of Indian Renaissance
- ओम प्रकश गाबा: भारतीय राजनीतिक चिन्तन
- के0एल0 कनल: भारतीय राजनीतिक चिन्तन

25.07.24

## Economics

### 601- Economic Policy of India

**Marks-100 Credits-4**

**Unit-I: Objectives of Macro:** Economic Policy in Developed and Developing countries. Formulation of Economic Policy: the Process, Policy for Controlling Inflation and Unemployment. An overview of Population Policy in India. Policy For Poverty Eradication. Overview of New Economic Policy.

**Unit-II: Industrial Policy in India:** Role and Objectives of Industrial Policy Private and Public Sector, Relation of Industry, MRTP and concentration of Economic Power. Private Foreign Investment in Indian Industries and its Regulation; Multinational corporations and Industrial Growth; Policy for Small-Scale Industries; India's Industrial Policy and Regional Development

**Unit-III: Agriculture Policy:** Objectives and Overview of Agricultural Policy in India. Agrarian Structure and Economic Policy; Brief Overview of Community centred Approach: community Development Project and Panchayati Raj. Genesis and Evaluation of the New Agricultural Strategy. Evaluation of MGNREGA. Green Revolution. Agricultural Price Policy. Food Policy and the Public Distribution system.

**Unit-IV: Trade Policy:** Export Policy and Import Policy. Exchange Rate policy and Devaluation. General Overview of Policies For Foreign Capital Inflow and Multi-national Assistance.

25.07.24

## Economics

### 601- Economic Policy of India

**Marks-100 Credits-4**

**Unit-I: Objectives of Macro:** Economic Policy in Developed and Developing countries. Formulation of Economic Policy: the Process, Policy for Controlling Inflation and Unemployment. An overview of Population Policy in India. Policy For Poverty Eradication. Overview of New Economic Policy.

**Unit-II: Industrial Policy in India:** Role and Objectives of Industrial Policy Private and Public Sector, Relation of Industry, MRTP and concentration of Economic Power. Private Foreign Investment in Indian Industries and its Regulation; Multinational corporations and Industrial Growth; Policy for Small-Scale Industries; India's Industrial Policy and Regional Development

**Unit-III: Agriculture Policy:** Objectives and Overview of Agricultural Policy in India. Agrarian Structure and Economic Policy; Brief Overview of Community centred Approach: community Development Project and Panchayati Raj. Genesis and Evaluation of the New Agricultural Strategy. Evaluation of MGNREGA. Green Revolution. Agricultural Price Policy. Food Policy and the Public Distribution system.

**Unit-IV: Trade Policy:** Export Policy and Import Policy. Exchange Rate policy and Devaluation. General Overview of Policies For Foreign Capital Inflow and Multi-national Assistance.

## Geography
## 601- Environmental Studies

**Marks-75 Credits-3**

**Unit-I:** Geography as a study of Environment, concepts & components of environment, Development of environmental studies, Approaches to environmental studies, concept of ecology and ecosystem. Man-Environment relationship, Agricultural and Industrial practices, science, technology, Society and environment.

**Unit-II:** The problems and causes of environmental degradation, Deforestation, soil erosion, Earthquakes and Tsunamis soil exhaustion, Desertification, Air pollution, water Pollution Noise Pollution, Disposal of solid waste, Population pressure.

**Unit-III:** Environmental management: Environmental education, preservation of ecological balance at local, regional and National level, Major environmental policies and programs.

**Unit-IV:** Sample studies - Ganga Action Plan, Tiger project, Tehri dam & Narmada Valley project.

**Unit-V:** Emerging environmental issues; population explosion, food security, global warming, bio-diversity and its conservation, sustainable development.

**Books Recommended**


- Jagadish Singh, Vatavaran Niyojan Aur Samvikas.
- P.S. Negi. Eco-Development and Environmental Geography (Hindi).
- G.P. Yadav & Ram Suresh, Paryavaran Adhyayan.
- V.K. Srivastava, Environmental and Ecology (Hindi).
- Griffith Taylor, Environmental race and migration.
- Sharma, H.S. and Chattopadhyay, S.K. Sustainable Developments concepts and issues, concept, New Delhi-2000.
- Reid, D., Sustainable Development, Earthscan, Pub. London, 1995.
- Kayastha, S.L. and Kumra, V.K. (1985) Environmental Studies, Tara Book Agency, Varanasi.


25.07.24

## Geography
## 601- Practicals

**Marks-50 Credits-2**

**(A) Field Work**

Unit-I Plane table Surveying; Radiation, Inter section & Resection method, two point problem and three Point problem.

Unit-II Surveying by Prismatic Compass, open traverse. Close traverse, Elimination of error. Bowditch Method, Axis Method.

Unit-III Use of Sextant; measurement of height-accessible and inaccessible method.

OR

Indian clinometers; Measurement of height-accessible and inaccessible method.

**(B) Field Study Report :**

Select a village or a town or a ward of a city and prepare a report based on primary and secondary data with the help of maps and diagrams

**(C) Viva-Voce & Sessional Records**

**Division of Marks:**

| | |
|---|---|
| (A) Field work (One exercise from each unit. Duration four hours) | 10+10+5= 25Marks |
| (B) Field Study report | 15Marks |
| (C) Viva-Voce & Sessional Records | 10Marks |

**Books Recommended**

- Singh, R.L., Elements of Practical Geography, Kalyani Pub. New Delhi.
- Khan, Z.A., Text book of practical Geography, Concept, New Delhi-1998.
- Sharma J.P.-Prayogik Bhugol.

25.07.24

## 601- Practical (B.Ed.)

**Marks-100 Credits-4**

1. Micro Teaching- at least 8 skills. **25**

   सूक्ष्म शिक्षण– कम से कम 8 कौशल।

2. Action Research Project- Based on School/Class/Community Problem. **20**

   क्रियात्मक अनुसंधान योजना– विद्यालय/कक्षा/सामुदायिक समस्याओं पर आधारित।

3. Use of ICT and development of power point presentation (PPT) including improvisation of teaching aids. **20**

   सूचना एवं सम्प्रेषण तकनालजी का अनुप्रयोग तथा पावर प्वाइंट प्रस्तुतियों का विकास जिसमें शिक्षण उपकरणों का निर्माण भी शामिल है।

4. Personality development with emphasis on- Communication skill including language use and improvement of speech. **15**

   व्यक्तित्व विकास– सम्प्रेषण कौशल (भाषा प्रयोग एवं वाक् सुधार सहित) पर बल देते हुए।

5. Internship - I (4 weeks) **20**

   School visit: primary/upper primary/secondary and preparation of status report about various facilities provided in the school.

   विद्यालय भ्रमण : प्राथमिक/उच्च प्राथमिक/माध्यमिक विद्यालय एवं विद्यालयों में उपलब्ध विभिन्न संसाधनों की एक रिपोर्ट तैयार करना।

25.07.24

**SEMESTER- VII**

| | | | |
|---|---|---|---|
| 701- Pedagogy of School Subject – 1 | विषय शिक्षण–1 | 100 Marks | 4 Credits |
| 702 -Pedagogy of School Subject – 2 | विषय शिक्षण–2 | 100 Marks | 4Credits |

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**Pedagogy of School Subjects – Paper Code 701 and 702**

Pedagogy of two school subject have to be selected from the following groups in which only one subject is to be selected from each group:

निम्नलिखित संवर्गों में से किन्हीं दो विषयों का चयन करना है जिसमें एक संवर्ग से एक ही विषय का चयन करना है :

| Group A | Group B |
|---|---|
| 1. Hindi teaching<br>हिन्दी शिक्षण | 1. History teaching<br>इतिहास शिक्षण |
| 2. Sanskrit teaching<br>संस्कृत शिक्षण | 2. Geography teaching<br>भूगोल शिक्षण |
| 3. English teaching<br>अंग्रेजी शिक्षण | 3. Civics teaching<br>नागरिक शास्त्र शिक्षण |
| | 4. Economics teaching<br>अर्थशास्त्र शिक्षण |

25.07.24

## Group- A

### 1- Hindi Teaching (हिन्दी शिक्षण)

**उद्देश्य** – इस प्रश्नपत्र के अध्ययन के उपरान्त विद्यार्थी :

1. शिक्षा में मातृ–भाषा शिक्षण के महत्व से अवगत हो सकेंगे।
2. हिन्दी भाषा शिक्षण के विभिन्न उद्देश्यों का निरूपण कर सकेंगे।
3. हिन्दी भाषा में उच्चारण, ध्वनि विज्ञान एवं उच्चारण संबंधी दोषों, कारणों एवं उनके निवारण से अवगत हो सकेंगे।
4. हिन्दी भाषा शिक्षण हेतु विभिन्न विधियों का उपयोग कर सकेंगे।
5. भाषा शिक्षण में दृश्य–श्रव्य साधनों का प्रभावी अनुप्रयोग कर सकेंगे।

**इकाई 1अ.** माध्यमिक स्तर पर उ0प्र0 बोर्ड द्वारा निर्धारित पाठ्यक्रम का समीक्षात्मक अध्ययन।

**ब.** निर्धारित पाठ्यक्रम का भाषिक पक्ष एवं शिक्षण हेतु निहितार्थ।

**इकाई 2अ.** मातृभाषा शिक्षण एवं उसका महत्व, राष्ट्रीय एकता के विकास में हिन्दी की भूमिका, हिन्दी शिक्षण के उद्देश्यः ज्ञानात्मक, कौशलपरक, रसात्मक एवं सर्जनात्मक।

**ब.** भाषा शिक्षण एवं भाषा विज्ञानः ध्वनि विज्ञान, पद विज्ञान, वाक्य विज्ञान एवं अर्थ विज्ञान, भाषा शिक्षण एवं उच्चारणः शुद्ध उच्चारण का महत्व, उच्चारण में दोष, कारण एवं निदान।

**इकाई 3 अ.** हिन्दी शिक्षण की विधियाँ – गद्य शिक्षण, पद्य शिक्षण एवं व्याकरण शिक्षण के सन्दर्भ में पाठ्योजना : आवश्यकता, विभिन्न प्रकार, निर्माण के पद।

**ब.** भाषा शिक्षण में पाठ्य पुस्तकों का महत्व, उद्देश्य एवं उनके प्रकार।

**इकाई 4अ.**भाषा शिक्षण में दृश्य–श्रव्य साधनों की भूमिकाः दृश्य उपकरण, श्रव्य उपकरण, दृश्य–श्रव्य उपकरण एवं कम्प्यूटर।

**ब.** हिन्दी शिक्षण एवं मूल्यांकन की नवीन प्रविधियाँ ।

**अध्ययन ग्रन्थ–**


- गुप्त, मनोरमा : भाषा शिक्षण सिद्धान्त और प्रविधि, केन्द्रीय हिन्दी संस्थान, आगरा।
- चतुर्वेदी, सीताराम : भाषा की शिक्षा, हिन्दी साहित्य कुटीर, वाराणसी।
- तिवारी, उदयनारायण : भाषा विज्ञान।
- तिवारी, भोलानाथ : भाषा विज्ञान, किताब महल, 22ए, सरोजनी नायडू मार्ग, इलाहाबाद।
- दूबे, मीरा : हिन्दी शिक्षण।
- पाण्डेय, रामशंकल : हिन्दी शिक्षण, विनोद पुस्तक मन्दिर, आगरा।
- वर्मा, रामचन्द्र : हिन्दी प्रयोग।
- चतुर्वेदी, शिखा : हिन्दी शिक्षण, आर. लाल बुक डिपो, मेरठ।


25.07.24

## 2- Sanskrit Teaching (संस्कृत शिक्षण)

**उद्देश्य** – इस प्रश्नपत्र के अध्ययन के उपरान्त विद्यार्थी :

1. शिक्षा में संस्कृत शिक्षण के महत्व से अवगत हो सकेंगे।
2. संस्कृत भाषा शिक्षण के विभिन्न उद्देश्यों का उल्लेख कर सकेंगे।
3. संस्कृत भाषा में उच्चारण, ध्वनि विज्ञान एवं उच्चारण संबंधी दोषों, कारणों एवं उनके निवारण से अवगत हो सकेंगे।
4. संस्कृत भाषा शिक्षण हेतु विभिन्न विधियों का उपयोग कर सकेंगे।
5. भाषा शिक्षण में दृश्य–श्रव्य साधनों का प्रयोग कर सकेंगे।

**इकाई 1अ.** उ0प्र0 माध्यमिक बोर्ड द्वारा निर्धारित संस्कृत विषय का पाठ्यक्रम उसका भाषिक पक्ष एवं शिक्षण हेतु निहितार्थ।

**ब.** संस्कृत विषय का अन्य विषयों/भाषाओं से सम्बन्ध।

**इकाई 2अ.** संस्कृत भाषा में उच्चारण सम्बन्धी छात्रों की कठिनाइयाँ, ध्वनि विज्ञान, उच्चारण–दोष, कारण एवं निवारण।

**ब.** भाषा शिक्षण में पाठ्यपुस्तकों का महत्व उद्देश्य एवं उनके प्रकार।

**इकाई 3अ.** संस्कृत शिक्षण में शैक्षणिक उपकरण एवं सहायक सामग्री– भाषा प्रयोगशाला, दृश्य सामग्री, दृश्य एवं श्रव्य सामग्री, कम्प्यूटर समर्थित अनुदेशन।

**ब.** संस्कृत शिक्षण हेतु पाठयोजना निर्माण, अर्थ, प्रकार, विभिन्न पद एवं उपयोगिता।

**इकाई 4अ.** संस्कृत शिक्षण की विधियाँ– गद्य के सन्दर्भ में, पद्य के सन्दर्भ में, व्याकरण के सन्दर्भ में,

**ब.** संस्कृत में मूल्यांकन की नवीन प्रविधियाँ।

**अध्ययन ग्रन्थ–**


- गुप्त, मनोरमा : भाषा शिक्षण, सिद्धान्त और प्रविधि, केन्द्रीय हिन्दी संस्थान, आगरा।
- चान्फे, बी0 एन0 : संस्कृत शिक्षण विधि।
- चौबे, विजयनारायण : संस्कृत शिक्षण विधि, हिन्दी संस्थान, लखनऊ।
- पाण्डेय, रामशकल : संस्कृत शिक्षण, विनोद पुस्तक मन्दिर, आगरा।
- तिवारी, भोलानाथ : भाषा विज्ञान, किताब महल, 22 ए, सरोजनी नायडू मार्ग, इलाहाबाद।
- द्विवेदी वाचस्पति : संस्कृत शिक्षण विधि, सुशील प्रकाशन, चौक पटना।


25.07.24

## 3- English Teaching

**Objective**- After Studying this paper, the student will be able to :

1. Explain the principles of language teaching.
2. Formulate the objectives of English teaching at different levels.
3. Use the appropriate method of teaching prose, poetry and grammar.
4. Make use of teaching aids appropriate for second language.
5. Prepare the lesson plan for teaching at different stages.

**Unit-I-**

A. A critical study based on the survey of the english language course prescribed at the school level and the implications for pedagogy of English.

B. Aspects of English language prescribed: English Grammar, Vocabulary and Usage.

**Unit-II**

A. Nature of English language: Some implications for organizing teaching of English as a second language, role of English language in India today, Objectives of teaching English at junior and senior stages of school.

B. English sounds: Segmental and supra segmental phonemes in English, English morphemes: derivational and inflectional, English syntax: Basic and transformed sentences in English.

**Unit-III**

A. Methods of teaching English: direct method, bilingual method: pattern practice, teaching methods for prose, poetry, grammar, reading, writing and composition.

B. Drills and exercises in teaching of English.

**Unit-IV**

A. Use of audio-visual and technological aids in teaching of English.

B. Testing and evaluation in English as a second language.

C. Uses of the mother tongue and teaching of translation in English.

25.07.24

**Reference Books**


- Bisht, Abha Rani, Teaching English in India, Vinod Pustak Mandir, Agra.
- Jain & Sharma, Essentials of English Teaching, RSA, International Publication, Agra.
- Nagaraj, G., English Language teaching: Approaches methods Techniques, Orient Longman, Kolkata.
- Pandey K.P. & Amita: Teaching English in India, Viswavidyalaya Prakashan, Varanasi.


25.07.24

## Group-B

### 1- History Teaching

**Objective-** After Studying this paper, the student will be able to:

1. Understand the place, scope, need, importance and utility of History Teaching in Education.
2. Understand relationship between History and other subjects and objectives of history teaching according to different periods.
3. Critically analyze concept of curriculum, and principles underlying present curriculum of history at various stages.
4. Apply special techniques by using various methods of History Teaching.
5. Prepare lesson plans in History teaching and understand the utility of teaching materials in History teaching.
6. Design tests for continuous evaluation in History Teaching.

**Unit-I**

A. A critical study of content of history prescribed at school level and its pedagogic implication.

B. History Teaching– Concept, Scope, Need and Place of History teaching in school curriculum, Aims and Objectives of history teaching at different stages.

**Unit-II**

A. Curriculum of History: concept and principles of curriculum in construction, Relationship of history with other subjects.

B. Different method of History teaching- Story, Explanation, Project and Discussion method.

**Unit-III**

A. Teaching material in History teaching and its importance, teaching chronology.

B. Lesson planning in History Teaching: meaning, different types of lesson plans.

**Unit-IV**

A. Evaluation in history, Construction of achievement test based on objective type items and determination of its reliability and validity.

B. History class and history teacher, Excursions and Museum: its importance.

25.07.24

**Practical Work –**

1. Developing a Unit- test on any topic.
2. Essay writing on any research related to history.

**Reference Books-**


- Tyagi, G.S. : Teaching History, Vinod Pustak Mandir, Agra (1990).
- Kochar, S.K. : Teaching of History, Sterling Publisher, Delhi (1967).
- Singh, Y.K.: Teaching of History: Modern Methods, Ashish books, Delhi (2010).
- Ghate V.D. : History Teaching, Hariyana Academy, Chandigarh (1989).
- Vajneshwari, R.: A handbook for History Teaching, Allied Publisher, Bombay (1996).
- Choudhary K.P.: Audio visual aids in Teaching Indian History, Atma Ram and Sons, Delhi (1968).
- Sharma, R.A. : History Teaching (Hindi), International Publishing House, Meerut (2001).
- Hartwell, E.C.: The Teaching of History (History Teaching Resources), Create space Independent publishing Platform, U.K. (2013).
- Husband, C. : What is History Teaching, Open University Press, U.K. (1996)

## 2- Geography Teaching

**Objective-** After studying this paper, the student will be able to:

1. Explain the importance and objectives of Geography Teaching in school curriculum.
2. Use different methods for Geography Teaching.
3. Prepare lesson plan of Geography Teaching.
4. Use teaching aids for making Geography Teaching effective.
5. Construct test in Geography Teaching.

**Unit-I**

A. A critical study of content of geography prescribed at school level and its pedagogic implication.

B. Geography teaching: Meaning, Nature, Need and Place of Geography in curriculum.

**Unit-II**

A. Aims and objectives of Geography teaching.

B. Curriculum of Geography- Concept and Principles of curriculum construction.

**Unit-III**

A. Methods of Geography Teaching – Observation method, Inductive and Deductive method, Lecture method, Excursion method, Demonstration method, Regional method, Comparative method, Project method, Sample study method, Concentric method and Problem solving method.

B. Lesson plan for Geography Teaching: techniques, related materials and their utility.

**Unit-IV**

A. Evaluation procedures for measuring achievement in Geography, construction of test, for evaluation of learning outcomes in geography based on Objective type items and determination of its reliability and validity.

B. Geography lab, library and club.

25.07.24

**Practical Work**

1. Making of a model and drawing maps related to the subject.
2. A Critical analysis of the teaching methods used in geography teaching in any two schools of Varanasi.
3. Writing an essay based on innovative practices and events related to geography.

**References Books**


- Arora K.L., The Teaching of Geography. R. Lal Pub. Meerut.
- Biswas Bhaskar Chandra, Learn and Teach Geography. Authors Press New Delhi.
- Cans, G.J., Handbook for Geography Teacher, London, Mathur Educational Ltd. 1957.
- Hal, Devid, Geography and the Geography Teacher, Landon, Geography Hall, 1976.
- Long and Robertson, Teaching of Geography, London, Honeman Educational Books, Ltd. 1958.
- Mesney, E.A., Teaching of Geography, London, Oxford University Press, 1952.
- Rao, M.S., Teaching of Geography, Anmol Pub. 1995.
- Singh, H.N., Geography Teaching, Vinod pustak mandir, Agra, 1985.
- Song, M.L., Handbook for Geography Teacher, London, Mathur Educational Ltd. 1974.
- Srivastava, K.M., Teaching of Geography, Sahitya Prakashan, Agra.
- Verma, J.P., Teaching of Geography, R.Lal book depot, meerut, 2012.
- Verma, O.V, Geography Teaching, Strling pub. 1991.
- Walford, R. Ed., Directions in Geography Teaching, London, longman's co. 1973.


25.07.24

## 3- Civics Teaching

**Objective-** After studying this paper, the student will be able to :

1. Explain the place, scope, need and importance of civics teaching in education.
2. Formulate the objectives of civics teaching according to different time periods and the correlation of civics with other subjects.
3. Critically analyze the present curriculum of civics at different levels, concept and construction of civics curriculum.
4. To use different methods of civics teaching.
5. To develop lesson plans on civics teaching and understand the importance of the content in civics teaching.
6. Construct test in civics teaching.

**Unit-I**

A. A critical study of the content of civics prescribed at school level and its pedagogic implications.

B. Teaching of Civics – Meaning, nature, need, importance and relation with other school subjects.

**Unit-II**

A. Aims and Objectives of Civics teaching at the school level.

B. Curriculum of Civics Teaching– Concept and Principles of curriculum construction.

**Unit-III**

A. Methods of Civics Teaching– Lecture method, Discussion method, Source method, Project method, Brain storming method, Simulated Teaching method and Problem solving method.

B. Format of various lesson plans: importance and construction of lesson plan for Civics Teaching.

**Unit-IV**

A. Importance and application of teaching aids in Civics Teaching, Activities for civics teaching, civics room and library, civics teacher.

B. Evaluation in Civics– Construction of achievement test based on objective type items and determination of its Reliability and Validity.

25.07.24

**Practical Works**

1. Constructing Unit- tests based on Civics curriculum at school level.
2. Writing an essay based on amendments in constitution.

**Reference Books-**


- Singh, Rampal : Teaching of civics, R. Lal Book Depot. Meerut (2012).
- Singh, Satnam. : Modern Methods of Teaching Political Science, Srishti Book Distributors, New- Delhi.
- Tyagi, Gurusaran: Teaching of civics, Vinod Pustak Mandir, Agra (2013).
- Yadav, Nirmal. : Teaching of Civics and Political Science.


25.07.24

## 4- Economics Teaching

**Objective** – After studying this paper, the student will be able to:

1. Indicate the importance and Objectives of Economics Teaching in school curriculum.
2. Use different methods of Teaching in Economics.
3. Make lesson plan of Economics Teaching.
4. Use Teaching aids for making Economics Teaching effective
5. Construct objective based objective type test items in Economics.

**Unit-I**

A. Content of Economics as a school subject at a glance: Its pedagogic implications in terms of interdisciplinary approach.

B. Economics Teaching: Nature, Scope and Place of economics teaching in school curriculum, Aims and Objectives of Economics teaching at different levels.

**Unit-II**

A. Economics curriculum – Concept, Principles of Curriculum construction in economics: critical analysis of present curriculum implemented at different levels of Education, Correlation of Economics with other subjects.

B. Methods of Economics Teaching – simulated Teaching, project method, lecture method, discussion method, brain storming and methods based on small groups.

**Unit-III**

A. Teaching aids & their use in Economics teaching.

B. Lesson planning in Economics Teaching: Meaning, types and importance.

**Unit-IV**

A. Methods of evaluation in Economics Teaching, Construction of tests for evaluation on the basis of objective type items and determination of its reliability and validity.

B. Economics library and club.

25.07.24

**Practical Work**

1. Construction of Unit- test in subject of economics at school level.
2. Essay writing on new researches and events related to economics.

**Reference Books**


- Agrawal, J.C.: Teaching of Economics, RSA International Publication, Agra.
- Anuja. Amrish Kumar : Economics of Education, Authors Pub.
- Roi, B.C.: Methods of Teaching of Economics, Prakashan Kendra, Lucknow.
- Singh, Satnam: Modern Methods of Teaching Economics, Srishti Book, New Delhi.

## Practical (B.Ed.)

**Internship -II (16 weeks) (School Attachment)** **200 Marks** **8 Credits**

1. Participation in school chores such as praycrs, assembly, organization of co-curricular activities etc. 10Marks
   विद्यालयी क्रियाकलापों यथा प्रार्थना, दैनिक सभा एवं पाठ्यक्रम सहगामी क्रियाओं के आयोजन में प्रतिभाग।
2. Practice teaching-30 lesson each subject total 60 lesson, supervised by B.Ed. faculty. 80+80= 160Marks
   शिक्षण अभ्यास– बी0एड0 पर्यवेक्षकों के निर्देशन में प्रत्येक विषय से 30 पाठ कुल 60 पाठ।
3. Community work 10Marks
   सामुदायिक कार्य
4. Scouting and Guiding -Under the guidance of an authorized trainer with certificate. 10 Marks
   स्काउटिंग एवं गाइडिंग– प्राधिकृत प्रशिक्षक के निर्देशन में प्रमाण पत्र सहित
5. Yoga Education – Under the guidance of a formally trained yoga expert with certification from the concerned institution. 10 Marks
   योग शिक्षा– औपचारिक रूप में प्रशिक्षित योग विशेषज्ञ के निर्देशन में प्रमाण पत्र सहित।

25.07.24

**SEMESTER-VIII**

## हिन्दी

### 801– उपन्यास, कहानी, एकांकी तथा अन्य लघु गद्य विधाएँ

**Credits-4**

अंक विभाजन– 3 व्याख्या –3 X 10 =30 अंक, 2 निबन्धात्मक प्रश्न– 2 X 20 = 40 अंक

5 लघु उत्तरीय प्रश्न – 5 X 6 = 30 अंक **पूर्णांक : 100**

**पाठ्य ग्रंथ :**

1. लोक ऋण (उपन्यास) – विवेकी राय, विश्वविद्यालय प्रकाशन, चौक, वाराणसी।
2. हिन्दी कहानी– सं0 डॉ0 उर्मिला मिश्र, विश्वविद्यालय प्रकाशन, वाराणसी।
   **संकलित कहानीकार** : प्रेमचन्द, जय शंकर 'प्रसाद', सच्चिदानन्द, हीरानन्द, वात्स्यायन 'अज्ञेय', मोहन राकेश, कमलेश्वर, राजेन्द्र यादव, शिवप्रसाद सिंह, निर्मल वर्मा, सूर्यबाला, ओमप्रकाश वाल्मीकि।
3. एकांकी धारा – सं0 डॉ0 लक्ष्मीशंकर गुप्त, अमृत प्रकाशन, वाराणसी।
   संकलित एकांकीकार : रामकुमार वर्मा, भुवनेश्वर, उपेन्द्रनाथ अश्क, हरिकृष्ण प्रेमी, जगदीशचन्द माथुर, विष्णु प्रभाकर, भारत भूषण अग्रवाल, धर्मवीर भारती।
4. विविधा (नवीन संस्करण) – सं0 डॉ0 श्रद्धानन्द, अमृत प्रकाशन, वाराणसी।
   संकलित विधाएँ : रेखा चित्र (महादेवी वर्मा) रिपोर्ताज (रांगेय राघव), जीवनी (विष्णु प्रभाकर), आत्म कथा (हरिवंश राय बच्चन), संस्मरण (बनारसी दास चतुर्वेदी)। यात्रा वृत्त (सच्चिदानन्द हीरानन्द वात्सायन अज्ञेय)।

**सहायक ग्रंथ :**

- नयी कहानी की भूमिका – कमलेश्वर
- नयी कहानी : संदर्भ और प्रवृत्ति – देवीशंकर अवस्थी
- हिन्दी कहानी – राजेन्द्र यादव
- हिन्दी रेखाचित्र – माखन लाल शर्मा
- हिन्दी जीवनी साहित्य : स्वरूप और विकास – भगवानदास महाजन
- हिन्दी में आत्मकथा साहित्य – एन0डी0 वर्मा
- हिन्दी का संस्मरण साहित्य – के0एस0 सहाय
- हिन्दी साहित्य में आत्मकथा – सरोज जोगी
- यात्रा साहित्य का उदभव और विकास – एस0एम0 माथुर

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## English Literature

### 801- New Literatures in English

**Marks-100 Credits-4**

The paper has been framed to familiarize the students with the writings in English all over the world.

**Unit-I:** Ten short answer questions based on the entire course including three passages for explanation

**Unit-II:**

**Australian Literature (Poetry)**

| | |
|---|---|
| W C Wentworth | 'The Wild Colonial Boy' |
| Ada Cambridge | 'An Answer' |
| Chris Wallace | 'Melbourne' |
| Kevin Gilbert | 'Mister Man' |

**Unit-III**

**American Literature (Drama)**

| | |
|---|---|
| Edward Albee | The Zoo Story |

**Unit-IV**

**Canadian Literature (Fiction)**

| | |
|---|---|
| Alice Munro | 'Menesceteung' from *Friend of my youth* |

**Unit-V**

**Afro-American Literature (Prose)**

| | |
|---|---|
| Alice Walker | In Search of Our Mother's Garden |
| | (Only 1st essay from Part Three) |

Q. No. 1. Ten short answer questions based on the entire course including three passages for explanation.

Q No. 2-5. One Long Answer Question from each unit (Unit II-V)

25.07.24

## संस्कृत

## 801– भारतीय दर्शन एवं संस्कृति

पूर्णांक–100 Credits- 4

| | | | |
|---|---|---|---|
| इकाई (i) | – श्रीमद्भगवद्गीता अध्याय 16 से 18) | | 40 |
| इकाई (ii) | – कठोपनिषद् | प्रथम अध्याय | 20 |
| इकाई (iii) | – तर्कसंग्रहः | प्रत्यक्ष प्रमाणपर्यन्त | 20 |
| इकाई (iv) | – भारतीय संस्कृति | वर्णाश्रम व्यवस्था एवं पुरुषार्थ | 20 |

संस्तृत ग्रन्थ

- श्रीमद्भगवद्गीता – गीता तत्त्वविवेचनी, जयदयाल गोयन्दका
- श्रीमद्भगवद्गीता – डॉ0 श्रीकृष्ण तिवारी
- कठोपनिषद् – डॉ0 आद्या प्रसाद मिश्र
- कठोपनिषद् – गीता प्रेस, गोरखपुर
- तर्कसंग्रहः – डॉ0 आद्या प्रसाद मिश्र
- तर्कसंग्रहः – प्रो0 दयानन्द भार्गव
- भारतीय संस्कृति – डॉ0 शिवदत्त ज्ञानी
- भारतीय संस्कृति – डॉ0 हरेन्द्र प्रसाद सिन्हा
- भारतीय संस्कृति – डॉ0 शिवबालक द्विवेदी
- हिन्दू संस्कार – डॉ0 राजबली पाण्डेय
- भारत की सांकृतिक साधना – डॉ0 रामजी उपाध्याय

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## Psychology

### 801- Organizational Behaviour

**Marks-100 Credits-4**

**Unit-I:** Introduction: Nature and Scope, contribution of Taylor, F.W. and Elton Mayo. New challenges and opportunities. Selection and Placement: Basic selection models, measurement of individual differences. Techniques of selection: Interview and psychological testing.

**Unit-II:** Personnel Training and Development: Training, Methods of Training on the job and off the job. Techniques of management development. Evaluation of training programmes. Major Theories: Maslow, Adams and Vroom. Financial and non-financial incentives. Job characteristics; two models: job enrichment, quality of work life.

**Unit-III:** Job Satisfaction and Industrial Moralc:Nature, determinants and theories, (Herzberg, Vroom). Performance Appraisal: Appraisal process, methods of performance appraisal and factors distorting performance appraisal. Organizational Stress: Nature, sources, role stress and its effect

**Unit-IV:** Human Engineering: Man-machine system. Designs, display, controls and action Accident and Safety: Risk taking behaviour. Accident proneness. Causes of accidents: Physical and human factors. Safety measures in industries.

**Books Recommended:**


- Blum, M. L. and Naylor J. C. (1968). Industrial Psychology: Its Theoretical and Social Foundations.
- Luthans, F (2005). Organizational Behaviour (10th Ed.). New York: TataMcGraw Hill.
- Rastogi, G. D. (1992). Vyavaharik Manovigyan. Agra: Har Prasad Bhargava.
- Singh, A. P. (1995). Vyavaharik Manovigyan. Varanasi: Abhishek Publications.


25.07.24

## Sociology

### 801- Pioneers of Indian Sociology

**Marks-100 Credits-4**

**Objectives**

The impact of various social thoughts and philosophies is very important in The formation of Indian Society. To have a proper understanding of Indian Social system, one must be acquainted to those thoughts. India has a rich philosophical tradition. Their contributions to sociology is very remarkable In this paper the students are introduced to some of the Pioneers of Indian Sociology.

**Unit I:** Radha Kamel Mukerjee: Social structure of values. Social Ecology.

D.P.Mukerjee: Cultural diversities, Modernization.

Andre Betille: Social Stralification, Peasant Society and Folk Culture.

**Unit II:** G.S.Ghurye: Caste, Rural Urban Community.

Iravati Karve : Kinship in India.

**Unit III:** M.N.Srinivas: Sankritization, Secularization, and Dominant Caste.

S.C.Dubey: Indian Village, Tradition, Modernization and Development.

**Unit IV:** M.S.A. Rao, TK Ooman: Social Movements in India.

Yogendra Singh: Modernization of Indian Tradition,

Social change in India: Culture and resilence.

**Essential readings:**


- Dubey, S.C.: Society in India, New Delhi.National Book Trust.
- Dubey, S.C. : Indian Village, London Routledge (1995)
- Dubey, S.C.: India's Changing Village, London Routledge (1958)
- M.N.Srinivas: India: Social Structure New Delhi, Hindustan Publishing Corporation, 1980.
- M.N.Srinivas: Social Change in Modern India, California, Berkeley University of California University Press 1963.
- Singh,Yogendra: Modernization of Indian Tradition,Delhi: Thomson Press 1973.
- Karve Irawati: Hindu Society: An interpretation. Poone. Deccan College 1961.

- G.S.Ghurye : Caste , Class and occupation, Popular Prakashan Bombay- 1950
- G.S.Ghurye: Culture and Society. Popular Prakashan Bombay-1945
- D.N.Majumdar: Races and Culture of India, Asia Publishing House, Bombay 1958.
- D.P.Mukerjee: Diversities. Peoples Publishing House, Delhi-1958
- Ooman,T.K. and R.N.Mukerjee: Indian Sociology : Reflections and Introspections, Popular Prakashan, Bombay 1986
- Andre Beteille: Essays in Comparative Sociology: Oxford University Press New Delhi.
- Andre Beteille: Society and Politics in India. Essays in Comparative Perspective: Oxford University Press: New Delhi.


25.07.24

## Philosophy

### 801- Social and Political Philosophy

**Marks-100 Credits-4**

**Unit-I:** Definition nature and scope of Social Philosophy. It,s relation to Sociology, Political Science and Ethics,Psychological basis of Social Philosophy.

**Unit-II:** Theories regarding the relation between Individual and Society (i) Individualistic Theory (ii) Idealistic Theory (iii) Organic Theory Principles regarding the origin of Society. Nature and Role of Family and Marriage in the Society as a Social institution.

**Unit-III:** Nature and Role of Secularism in the Society. Theories regarding the social change– Constitutionalism, Revolutionalism, Terrorism and Satyagrah, Politial Ideals-Idealistic Socialism and Scientific Socialism, Democracy.

**Unit-IV:** The Thorghts of Veda, Bhagvadgeeta, Gandhi, Bhagvandas & Dr Ambedkar regarding-Varna, Caste and Ashram, Tradition, Change, Modernity.

**Suggested Readings**


- D.D. Raphael – Problems of Political Philosophy
- J.S. Machanji– An outlines of social Philosophy
- Dr. Ramnath– Social Philosophy for the Beginners
- डॉ० अशोक कुमार वर्मा– समाज दर्शन
- डॉ० ह्रदय नारायण मिश्र– समाज दर्शन
- डॉ० गीतारानी अग्रवाल– धर्म शास्त्रों का समाज दर्शन
- डॉ० जगदीश सहाय श्रीवास्तव– समाज दर्शन की भूमिका
- डॉ० शिव भानु सिंह– समाजदर्शन
- डॉ० संगम लाल पाण्डेय– समाज दर्शन की एक प्रणाली
- वी०एन०सिन्हा– समाजदर्शन : सामाजिक एवं नैतिक


25.07.24

## History

### 801- History of Modern World (1920-1947)

**Marks-100 Credits-4**

**Unit-I:**

League of Nations-Nature, Organization, Achievements and Failure

Search for Security

Problem of Disarmament

Foreign Policy of France after First World War.

Foreign Policy of Britain after First World War.

**Unit-II:**

Rise of Dictatorship

Italy-Fascism and Mussolini

Germany-Nazism and Hitler

Turkey-Mustafa Kamal Pasha and Regeneration of Turkey

Rise of Japan after First World War

**Unit-III:**

Russia after Revolution

Era of Lenin and Stalin

Great Economic Depression (1929-1932)

New Deal Policy of Roosevelt

Foreign Policy of America between two World Wars

**Unit-IV:**

Second World War-Causes and Result

United Nations Organization-Structure and Achievements

China-Rise of Komintang Party

Sun Yat Sen and Chiang Kai Sek

**Books Recommended**

- International Relation between the Two World Wars-E.H. Carr
- दो विश्वयुद्धों के बीच अन्तर्राष्ट्रीय सम्बन्ध (1919–1939)–ई0 एच0का0
- अन्तर्राष्ट्रीय सम्बन्ध (1919–1945)–मदन गोपाल गुप्ता
- आधुनिक विश्व का इतिहास–ए0के0 मित्तल

## Political Science

## 801- International Politics

**Marks-100 Credits-4**

**Unit-I**

Meaning Nature and Scope of International Politics; Approaches to the Study of International Politics – Idealist, Realist and Systems

**Unit-II**

The Modern State System; Power and its Elements; National Interest; Balance of Power; Collective Security; Role of Ideology; Foreign Policy– its determinants

**Unit-III**

Cold War; Détente; New-Cold War; Post-Cold War International Politics; Non-Aligned Movement; Problems of the Third World

**Unit-IV**

New International Economic Order and New-Colonialism; Foreign Policy of U.S.A. Russia and China in the post-Second World War era; India's Foreign Policy – India and its neighboring Nation; India and ASEAN

**Recommended Books**

- Mahendra Kumar: Theoretical Aspects of International Politics **(हिन्दी में भी उपलब्ध)**
- Prakash Chandra: International Relation
- Prakash Chandra: International Politics
- पुष्पेश पंत एवं अन्य: अन्तर्राष्ट्रीय सम्बन्ध
- वी0एस0 खन्ना: भारत की विदेश नीति
- आर0एस0 यादव: भारत की विदेश नीति

25.07.24

## Economics

## 801- Quantitative Methods

**Marks-100 Credits-4**

**Unit-I**

**Algebra:** Theory of numbers, Factorization, A.P., G.P. and H.P. series, Surds and indices, Identities and equations; Simple, quadratic and simultaneous. Logarithimic and exponential functions, Determinants. Matrices, basic operations, applications.

**Unit–II**

**Calculus:** Limits and functions, Derivations of functions of one and two variables, Higher order derivatives, Maxima and minima, Convexity and concavity and homogeneous functions.

**Unit–III**

Nature, Scope and importance of statistics for economists, Methods of data collection, Classification, Tabulation, Measures of central tendency, Arithmetic mean, Median, Mode, Measures of dispersion, Range, Mean Deviation and Standard Deviation and Coefficient of variation.

**Unit–IV**

Relationship between two variables and correlation coefficient. Definition index numbers and computation of simple indices. Time series, Concept and components. Agricultural statistics, Industrial statistics and population census.

**Books Recommended:**

- R. G. D. Allen – Mathematics for Economics
- Mehta & Madnani - Mathematics for Economics
- Taro Yamaney - Mathematics for Economics
- A. L. Nagar & R. K. Das – Basic Statistics (latest edition)
- D. N. Elhance – Fundamentals of Statistics
- डॉ. जे.पी. मिश्र – गणितीय अर्थशास्त्र
- मेहता एवं मदनानी – अर्थशास्त्र में प्रारंभिक गणित

25.07.24

## Geography

### 801- Regional Studies of any one of the following Regions

**Marks-100 Credits-4**

**(A) South West Asia**

**Unit-I:** Region as a geographical entity and as a component of global system. Basis of regionalization/ grouping of countries - Geographical, political, historical, cultural, etc.

**Unit-II:** Structure Relief, climate and climatic regions, vegetation. Irrigation, Power and Mineral resources.

**Unit-III:** Population distribution, growth, distribution pattern, migration. Agriculture, Industries Transport and Trade.

**Unit-IV:** Strategic importance of the region, Suez Canal, Geographical background of the modern problems.

**Unit-V:** Detailed regional study of Turkey. Iraq. Israel and Saudi Arabia.

**Book Recommended**

- W.B. Fisher: The Middle East
- Cressey: Cross-Road
- East and Spate: Changing Map of Asia
- N.S. Ginsburg: Pattern of Asia
- W. Willcocks: The Irrigation of Mesopotamia.
- J.Jones: Turkey
- The Statesman's Year book: 2001-2002
- Vishwanath Tiwari - Asia, Ka Bhugolik Swaroop
- Mahesh Narain Nigam And B.L. Garg-Pashchimi Asia

25.07.24

**(B) South East Asia**

**Unit-I:** Region as a geographical entity and as a component of global system. Basis of regionalization/ grouping of countries. Geographical, political, historical, cultural etc.

**Unit-II:** Structure, Relief, Climate and climatic regions, vegetation. Irrigation power and Mineral resources.

**Unit-III:** Population - distribution, growth, distribution pattern, migration - Agriculture, industries, Trade and Transport.

**Unit-IV:** Strategic importance of the region, Geographical background of the modern problems.

**Univ-V:** Detailed regional study of Myanmar, Thailand, Malaysia and Indonesia.

**Book Recommended**

- Dudely Stamp : Asia
- Fisher, Charles, A : South East Asia
- Dobby : South East Asia
- Dr. Jagdish Singh - Monsoon Asia
- Dr. V.K. Srivastava - Asia
- Vishwanath Tiwari Asia Ka Bhugolik Swaroop
- Dr. M.N. Nigam & B.L. Garg - Mansoon Asia

25.07.24

**(C) Far East Asia**

**Unit-I:** Region as a geographical entity and as a component of global system. Basis of regionalization/ grouping of countries geographical, political, historical, cultural, etc.

**Unit-II:** Structure, Relief, climate and climatic regions, vegetation, Irrigation, Power and Mineral resources.

**Unit-III:** Population- distribution, growth, distribution pattern, migration, Agriculture, Industries, Trade and Transport.

**Unit-IV:** Strategic importance of the region, Geographical background of the modern problems.

**Unit-V:** Detailed regional study of China and Japan.

**Book Recommended**

- Dr. M.N. Nigam- Mansoon Ka Asia
- Vishwanath Tiwari - Asia Ka Bhaugolik Swaroop
- Trewartha ; G.T. Japan.

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## Pedagogy Related

### 801 & 802- A: Human Rights, Non-Violence & Peace Education

**Marks-100 Credits-4**

**Objectives**

The student teachers will be able to:-

1. Develop an understanding and awareness of human rights, duties and co-existence of all living beings.
2. Prepare teachers to believe that alternative and less destructive measures tend to eradicate the social evils.
3. To help them to understand the methodology of behavioral modification through training in non-violence.
4. To enable the student teacher to identify and understand the role of peace education vis-a-vis the aim of transforming the prevalent society in a peaceful state.
5. To acquaint the student teachers with the various perspectives of environmental ethics and help them to reframe their life style for a harmonious relation with nature.

**Contents**

**Unit-I: Human Rights: Issues and Perspectives**

(a) History of the idea of Human Rights.

(b) Political, Civil, Economic, Social and Cultural Rights.

(c) Indian perspective of Rights and Duties.

(d) Problem of Violation of Human Rights: some emerging issues.

**Unit-II: Non-violence**

(a) Conceptual development.

(b) Vedic, Jain, Buddhist & Gandhian Tradition.

(c) Non-violence in Practice-Respect for all living beings, cruelty against animals, Animal Rights and Non-violence

(d) Non-violent Resistant methods and few examples of victory without violence.

25.07.24

**Unit-III: Training in Non-violence**

(a) Conceptual development and necessity.

(b) Change in Heart: Training of the Mind, Change in attitude: Training in open mindedness.

(c) Change in life style: Training in life style modification and structural change: Training for change in the system.

(d) Conflict & conflict Management.

**Unit-IV: Peace Education**

(a) Concept of Peace and Peace Education.

(b) Development of Peace Education.

(c) Peace Education and Disarmament Education for a new world order.

(d) Legitimacy and limitation of Peace Education.

**Assignment**

Preparing a Training programme and conducting a Training of Mind/Training in open mindedness / training in life style/ Training for change in the system.

**Transactional Strategies**

The course content will be transacted through interactive sessions, lectures, tutorials and demonstrations.

**Evaluation**

The course content will be of four (4) credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and 20 marks will be for evaluation which shall be done on the basis of sessional work.

**Readings**


- Chitkara, M. G. (2003), Education and Human Values, A.P.H. Publishing Corporation, New Delhi.
- Prashad, D. (1984), Peace Education and Education for Peace, G.P.F., New Delhi.
- Doris, H. and Mullick, K. (1990), Non-violence: A Reader in the Ethics of Action, G.P.F., New Delhi.


25.07.24

- Jawahar, L. K. (1998), Human Rights: Issues and Perspectives, Regency Publication, New Delhi.
- Meyer, J. R. (1976), Reflections on Values Education, Wilfrid Laurier U. Press, Canada.
- M. Raja (1998), Human Rights, Soorya Pathippakalm, Tiruchirapalli.
- Talesra, H. L., N. Pancholy, and M.L. Nagda (2001), Human Rights Education (Edited), Regency Publication, New Delhi.
- Talesra, H. L. and N. Pancholy (2003), Human Rights and Education (Hindi), Ankur Publication, Udaipur.
- Venkataiah, N. (2004), Value Education, A.P.H. Publishing Corporation, New Delhi.
- White, J. P. (1990), Education and the Good Life, Kogan Page, London.

## 801 & 802- B: Special Education

**Marks-100 Credits-4**

**Objectives**

The student teachers will be able to:-

1. Acquaint themselves with the need and characteristics of special children.
2. Gain the knowledge about identification and prevention of special children.
3. Understand various problems of special children.
4. Know about various educational remediations to be provided for special children.

**Contents**

**Unit-I:**

(a) Concept, Nature, types and objectives of Special Education.

(b) Education of Mentally Retarded: Concept, Characteristics, Teaching Strategies, Remedial Programme and Prevention of Mental Retardation.

(c) Role of various regulatory bodies in special education with particular reference to RCI.

**Unit-II:**

(a) Education of the Visually Impaired: Concept, Characteristics, Prevention and Educational Programmes for Visually Impaired.

(b) Education of the Hearing Impaired: Concept, Characteristics, Prevention and Educational Programmes for Hearing Impaired.

(c) Education of the Orthopedically Handicapped: Concept, Types, Characteristics and Educational Programmes for Orthopedically Handicapped.

**Unit-III:**

Education of the Gifted and Creative Children: Concept, Characteristics and Educational Programmes. Creativity and Identification Process.

**Unit-IV:**

(a) Learning Disabled Children: Concept, Characteristics, Identification and Educational Programmes.

(b) Education for Juvenile Delinquents: Concept and Characteristics. Anti Social and Character Disorder. Educational Programmes for Rehabilitation

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**Assignment**

Preparing a lesson plan using role play/street play Model and implementing the same in the class of special children.

**Transactional Strategies**

The course content will be transacted through lectures, discussions, interactive sessions and multimedia presentations.

**Evaluation**

The course content will be of four (4) credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and rest 20 marks will be for evaluation which shall be done on the basis of sessional work.

**Readings**


- Bhargava, M. (2004), Exceptional Children: Their Education and Rehabilitation, H.P. Bhargava Book House, Agra.
- Dash, M. K. (2008), Inclusive Education, Harprasad Institute of Behavioural Studies, Agra.
- NCERT (1987), Scheme of Integrated Education for Disabled Children, NCERT, New Delhi.
- NCTE (2004), Some Specific Issues and Concerns of Teacher Education, NCTE, New Delhi.
- Panda, K.C. (1997), Education of Exceptional Children, Vikas Publishing House, New Delhi.
- Pandey, R.S., & Advani L. (1995), Perspectives in Disability and Rehabilitation, Vikas Publishing House, New Delhi.
- Rao, V.K. (2004), Special Education, APH Publishing Corporation, New Delhi.
- Sharma, P. (1988), Teachers Handbook on IED Helping Children with Special Needs, NCERT, New Delhi.
- Sharma, R.A. (2008), Fundamentals of Special Education. R. Lall Book Depot., Meerut.
- Sharma, S. (1999), Understanding and Educating Blind, National Psychological Corporation, Agra.
- Singh U.K. (2004), Special Education, Commonwealth Publishers, New Delhi.

## 801 &802 -C: Elementary Education

**Marks-100 Credits-4**

**Objectives**

The student teachers will be able to:-

1. Understand the role of Elementary and Non- Formal Education in India.
2. Develop proper understanding of various components of NPE-1986 and review of NPE- 1992 related to Elementary Education.
3. Understand the role of local bodies, state government and non-government organizations.
4. Know about various programmes related to Elementary Education.
5. Identify suitable methods of teaching For Non-Formal Education.
6. Understand the place of Non-Formal Education in the teacher training curriculum.

**Contents**

**Unit-I:**

Brief history and concept of elementary education and its Constitutional Provisions. National Policy on Education 1986 and the revised policy of 1992 with special reference to Elementary Education.

**Unit-II:**

(a) Role of Panchayats, local bodies, state governments and non-governmental organizations in Elementary Education: Special qualities of an Elementary school teacher. Need for orientation and refresher courses for elementary school teacher. Role of basic training centres and DIETs in providing training to Elementary school teacher.

(b) Programmes related to Elementary Education- MLL, ECCE, DPEP, EGS & AIE, SSA.

**Unit-III:**

(a) Introduction to Non-formal Education: meaning, nature, scope and importance, difference between Non-Formal, Formal and Informal Education. Agencies of Non-Formal Education.

(b) Functions of Non-Formal Education with special reference to all round development of rural people. Psychological and sociological bases of Non-Formal Education.

**Unit-IV:**

(a) Curriculum for Elementary and Non-Formal Education.

(b) Modern methods of teaching in Elementary and Non-Formal Education.

25.07.24

(c) The place of Non-formal Education in the Teacher Training Curriculum. Organization of Non-Formal Education.

**Assignment**

Visit to an elementary school and preparation of status report about various facilities provided in the school.

**Transactional Strategies**

The course content will be transacted through lectures, interactive sessions, group discussions and field trips.

**Evaluation**

The course content will be of four (4) credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and 20 marks will be for evaluation which shall be done on the basis of sessional work.

**Readings**


- Jolly K.G. (1992), Literacy for all by 2001: Strategies at District Level, D.K. Publishers, New Delhi.
- Mehta, P.L. & Poonga, R. (1997), Free and Compulsory Education, Deep & Deep Publications, New Delhi.
- Mich, Ivan (1972), Deschooling Society, Penguin, London.
- Naik, J.P. (1975), Elementary Education in India: A Promise to Keep, Allied Publishers, Bombay.
- Rajput, J.S. (1994), Universalization of Elementary Education: Role of Teacher Education, Vikas Publishing House, New Delhi.
- Rao, D. (1998), Economics of Primary Education, Rawat Publications, Jaipur.
- Rao, Digumarti Bhaskara (1997), Success Story of a Primary Education Project, APH Publishing Corporation, New Delhi.
- Reimer (1972), The school is Dead, Penguin, London.
- Report of the National Seminar on Non-Formal Education (1980), Department of Education, South Gujarat University, Surat.
- Shah, A.B. & Bhan, S. (1980), Non-Formal Education and the NAEP, Oxford University Press, Delhi.
- Talesra, H. (1978), Non Formal Education, Himanshu Publications, New Delhi.


25.07.24

## 801 &802- D: Educational and Vocational Guidance

**Marks-100 Credits-4**

**Objectives**

The student teachers will be able to:-

1. Understand the Importance of Guidance in school.
2. Identify the difficult areas in learning of various school subjects.
3. Understand the types of guidance.
4. Acquaint themselves with various services in Guidance.
5. Realize the importance of counseling services in school programmes and career orientations.
6. Gain knowledge about organization of guidance services in schools for children having problems in learning.

**Contents**

**Unit-I:**

(a) Meaning, nature, principles and needs of guidance.

(b) Objectives and functions of guidance services at Primary, Secondary and Higher education levels.

**Unit-II:**

(a) Types of Guidance:-Educational, Vocational and Personal.

(b) Concept of informatory, preparatory, placement and follow- up services.

**Unit-III:**

Counselling: meaning, types, methods and techniques for children with specific learning disabilities.

**Unit-IV:**

(a) Anecdotal and cumulative records.

(b) Role of guidance services in the measurement of intelligence and personality tests.

(c) Role of guidance in school management.

**Assignment**

Preparing a special guidance programme for secondary students to meet out the challenges in the present day scenario.

**Transactional Strategies**

The course content will be implemented through lectures, discussions, interactive sessions and multimedia presentations.

**Evaluation**

The course content will be of four (4) credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and 20 marks will be for evaluation which shall be done on the basis of sessional work.

**Readings**


- Aggarwal, J. C. (1999), Educational and Vocational Guidance and Counselling, Doaba House, New Delhi.
- Clifford, P.F. (1958), Guidance Services in Schools, McGraw Hill Book Co. Inc., New York.
- Super, Donald B. (1962), Appraising vocational fitness, Harper and Brothers, New York.
- Erickson, Clifford E. (1947), A Basic Text for Guidance Workers, Prentice Hall Inc., New York.
- Hoose, Willian N. Van (1979), Counselling and Guidance in the 20th Century, Houghton Mifflin Co., Boston.
- Jones, A.J. (1963), Principles of Guidance and Pupil Personnel Work, McGraw Hall, New York.
- Kochhar, S.K. (1997), Educational and Vocational Guidance in Secondary Schools, Sterling publication, New Delhi.
- Peters, H.J. and Hanson, J.C. (1968), Vocational Guidance and Career Development, Macmillan, New York.
- Strang, Ruth (1933), The Role of Teacher in Personnel Work, Teacher College, Columbia University.
- Singh, R. (1994), Educational and Vocational Guidance, Commonwealth Publication, New York.
- Pandey, K.P. and Bhardwaj, Amita. (2007), Educational and Vocational Guidance in India, Vishwavidyalaya Prakashan, Varanasi.


25.07.24

## 801 & 802 E- Value Education

**Marks-100 Credits- 4**

**Objectives**

The student teachers will be able to:-

1. Understand the nature, meaning, need and sources of values.
2. Get acquainted with various bases of values.
3. Get familiar with main categories of human values.
4. Gain the knowledge of various ways and means of inculcating values among students.
5. Acquire the ability of achieving the objectives of value education at School level.

**Contents**

**Unit-I:**

(a) Meaning, nature and need of values.

(b) Meaning, nature, objectives, importance and scope of value education. Approaches to value education.

**Unit-II:**

Theoretical bases-

i. Philosophical perspective Four Purusharthas- Virtue, Wealth, Pleasure, Self-realization. Self-Realization- Panchakosha- Annamaya, Pranamaya, Manomaya, Vijnanamaya, Anandmaya.

ii. Social Cultural Basis- Family, Neighbourhood, Religion, Education, Institute, Constitution, Traditions.

iii. Psychological Basis of value development- Cognitive development approach by Lawrence Kohlberg- pre conventional, conventional and post conventional.

**Unit-III:**

Eight Categories of Human Values-

i. Social Values- friendship, love, brotherhood.
ii. Aesthetic Values- beauty.
iii. Intellectual Values- knowledge, attainment of truth.
iv. Ethical Values- truthfulness, Justice, benevolence, self-control.
v. Religious Values- worship, devotion, commitment.
vi. Health Values- Sound, Mental and Physical health, efficiency and productivity.
vii. Recreation Values- Leisure activities that enrich the life of an individual.
viii. Economic Values- instrumental in other values.

25.07.24

**Unit-IV:**

(a) Ten values to be inculcated through education: Dignity of Labour, National Integration, Patriotism, Sensitivity, Gender Equality, Courtesy, Secularism, Tidiness and Scientific temper

(b) Learning Value through various activities: Student self-government, celebration of festivals of different religions and communities, tree plantation, organizing campaigns on sanitation, nutrition etc. Participation in community development activities, service to needy, carrying out relief activities.

**Assignment**

1. Study of essays and articles on value concerns, autobiographies and biographies, parables, episodes from real life. Listening speeches, poems and songs. Discussion, debates and competitions for value clarification.
2. Dealing with value dilemmas: Enactment, role play, simulation, jurisprudential Model, street plays.
3. Preparing a lesson plan using role play /simulation/ jurisprudential/ street play model and implementing it.
4. Visit to community affected by a calamity and writing a report regarding relief programme based on group work.

**Transactional Strategies**

The course content will be transacted through interactive sessions, lectures, tutorials, demonstrations and group work.

**Evaluation**

The course content will be of 4 credits which are equivalent to 100 marks. Out of this 80 marks will be for summative evaluation (final exam) and rest 20 marks will be awarded on the basis of sessional work.

**Readings**


- Damle, Y.B. (1967); 'Education and Social Values', paper presented in the conference of Indian Sociologists (October, 14-16, 1967): Indian Sociological Society, Bombay.
- Hartog Philip; 'Some aspects of Indian Education: Past and Present': Oxford University Press, London.
- Havighurst R.J. (1953); 'Human Development and Education' : Longman's Green & Company, New York.


25.07.24

- Jois, Justice M. Rama; 'Human Rights and Value Education': NCTE, New Delhi.
- Kabir Humayun (1961); 'Education in New India': Asia Publishing House, New Delhi.
- Meyer J.R. (1976); 'Reflections on Value Education': Wilfrid Laurier University Press, Canada.
- Mukerji R.K. (1949); 'The Social Structure of Values': Macmillan & Company, London.
- Mukerji R.K. (1964); 'The Dimension of Values, A Unified Theory': George Allen and Unwin Limited, London.
- Mukerji S.N. (1960); 'Education in India: Today and Tomorrow': Acharya Book Depot, Baroda.
- Piaget, J. (1960); 'The Moral Judgment of the Child': Free Press, New York.
- Smith H.C. (1966); 'Sensitivity to People': Mc Graw Hill Company, New York.


25.07.24

# Course structure of 4 years B.Sc. B.Ed.

The student opting for B.Sc. Bed. Shall be choose three subjects from the list given below in addition to the compulsory subjects Pedagogy related course.

***Group A. Chemistry, Physics, Mathematics.***

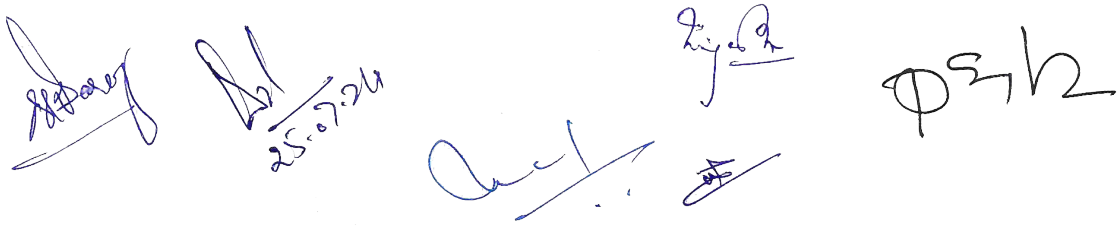
***Group B. Chemistry, Botany, Zoology.***

## Semester-I

| S.N. | Name of Subject | Paper | Course Title | Marks | Credits |
|---|---|---|---|---|---|
| 1. | Chemistry | 101 | *INORGANIC CHEMISTRY* | 75 | 3 |
| 2. | Physics. | 101 | *MECHANICS* | 75 | 3 |
| 3. | Mathematics. | 101 | *Algebra and Co-ordinate Geometry of Two Dimensions* | 100 | 4 |
| 4. | Botany | 101 | *ALGAE, LICHENS AND BRYOPHYTES* | 75 | 3 |
| 5. | Zoology | 101 | *Animal Diversity and Evolution* | 75 | 3 |
| | Pedagogy Related (B.Ed) | 101 | Philosophical Dimensions of Education | 100 | 4 |

## Semester-II

| S.N. | Name of Subject | Paper | Course Title. | Marks | Credits |
|---|---|---|---|---|---|
| 1. | Chemistry | 201 | *Organic Chemistry*<br>*Practical* | 75<br>50 | 3<br>2 |
| 2. | Physics. | 201 | *OPTICS*<br>*Practical* | 75<br>50 | 3<br>2 |
| 3. | Mathematics. | 201 | *Calculus* | 100 | 4 |
| 4. | Botany | 201 | *MYCOLOGY, MICROBIOLOGY AND PHYTOPATHOLOGY*<br>*Practical* | 75<br>50 | 3<br>2 |
| 5. | Zoology | 201 | *Biology of Nonchordates*<br>*Practical* | 75<br>50 | 3<br>2 |
| | Pedagogy Related (B.Ed) | 201 | Psychological Dimensions of Education | 100 | 4 |



**Semester-III**

| S.N. | Name of Subject | Paper | Course Title. | Marks | Credits |
|---|---|---|---|---|---|
| 1. | Chemistry | 301 | *Inorganic Chemistry and Physical Chemistry* | 75 | 3 |
| 2. | Physics. | 301 | *ELECTROMAGNETICS & STATISTICAL AND THERMAL PHYSICS* | 75 | 3 |
| 3. | Mathematics. | 301 | *Co-ordinate Geometry of 3-Dimensions and Vector Calculus & Differential Equations* | 100 | 4 |
| 4. | Botany | 301 | *PALAEOBOTANY,PTERIDOPHYTES AND GYMNOSPERMS,ECONOMIC BOTANY, ETHENOBOTANY* | 75 | 3 |
| 5. | Zoology | 301 | *Chordate Structure and Function And Developmental Biology* | 75 | 3 |
| | Pedagogy Related (B.Ed) | 301<br>301 | Educational Management and leadership<br>Educational Measerment and Evaluation | 100<br>100 | 4<br>4 |

**Semester-IV**

| S.N. | Name of Subject | Paper | Course Title. | Marks | Credits |
|---|---|---|---|---|---|
| 1. | Chemistry | 401 | *ORGANIC CHEMISTRY*<br>*Practical* | 75<br>50 | 3<br>2 |
| 2. | Physics. | 401 | *QUANTUM MECHANICS AND SPECTROSCOPY*<br>*Practical* | 75<br>50 | 3<br>2 |
| 3. | Mathematics. | 401 | *Numerical Analysis and Linear Programming* | 100 | 4 |
| 4. | Botany | 401 | *TAXONOMY, ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS*<br>*Practical* | 75<br>50 | 3<br>2 |
| 5. | Zoology | 401 | *Immunology, Microbiology and Biotechnology*<br>*Practical* | 75<br>50 | 3<br>2 |
| | Pedagogy Related (B.Ed) | 401<br>401 | Action Research in Education<br>Environmental Education | 100<br>100 | 4<br>4 |

25.7.24

**Semester-V**

| S.N. | Name of Subject | Paper | Course Title. | Marks | Credits |
|---|---|---|---|---|---|
| 1. | Chemistry | 501 | *Inorganic Chemistry* | 75 | 3 |
| 2. | Physics. | 501 | *ELECTRONICS* | 75 | 3 |
| 3. | Mathematics. | 501 | *Analysis and Laplace Transforms* | 100 | 4 |
| 4. | Botany | 501 | *CELL BIOLOGY, GENETICS, PLANT BREEDING AND EVOLUTION* | 75 | 3 |
| 5. | Zoology | 501 | *Cell Biology and Genetics* | 75 | 3 |
| | Pedagogy Related (B.Ed) | 501 | Education Technology | 100 | 4 |

**SEMESTER-VI**

| S.N. | Name of Subject | Paper | Course Title. | Marks | Credits |
|---|---|---|---|---|---|
| 1. | Chemistry | 601 | *Physical Chemistry*<br>***Practical*** | 75<br>50 | 3<br>2 |
| 2. | Physics. | 601 | *SOLID STATE PHYSICS*<br>***Practical*** | 75<br>50 | 3<br>2 |
| 3. | Mathematics. | 601 | *Abstract Algebra* | 100 | 4 |
| 4. | Botany | 601 | *ECOLOGY AND ENVIRONMENTAL BIOLOGY*<br>***Practical*** | 75<br>50 | 3<br>2 |
| 5. | Zoology | 601 | *Animal Physiology and Biochemistry*<br>***Practical*** | 75<br>50 | 3<br>2 |

**6. Practical (B.Ed.)** **100 Marks**

1. Micro Teaching- at least 8 skills**.** **25 Marks**

2. Action Research Project- Based on School/Class/Community Problem. **20 Marks**

3. Use of ICT and development of power point presentation (PPT) including improvisation of teaching aids**.** **20 Marks**

4. Personality development with emphasis on- Communication skill including language use and improvement of speech**.** **15 Marks**

5. Internship 1 (4 weeks) School visit: (primary/upper primary/ secondary) and preparation of status report about various facilities provided in the school. **20 Marks**

25.7.24

## SEMESTER VII

**701**-Pedagogy of School Subject- 1 Teaching subject-1 **Marks 100 Credit** 4
**702**-Pedagogy of School Subject- 2 Teaching subject-2 **Marks 100 Credit** 4
Pedagogy of two school subject have to be selected from the following one group.
***Group A- Science Teaching,Mathematics Teaching.***
***Group B – Science Teaching,Biological science Teaching.***

***Practical (B.Ed. ) Internship-II (16 weeks) (School Attachment) 200 Marks (8Credits)***

1. Participation in school chores such as prayers, assembly,organization Co-curricular activities etc**.** **10 Marks**

2. Practice teaching-30 lesson each subject total 60 lesson, supervised by B.Ed. faculty **80+80-160 Marks**

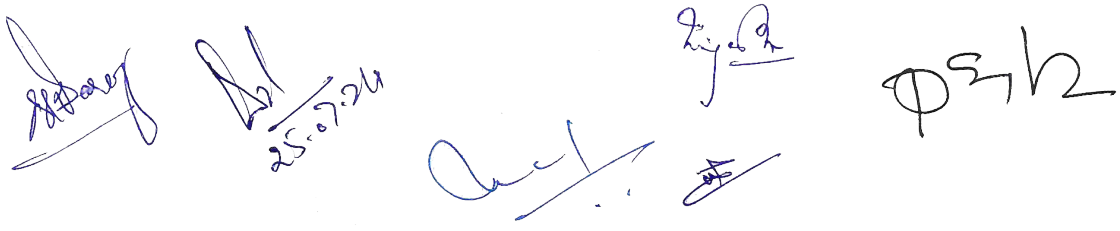
3.Community_work
**10 Marks**

4. Scouting and Guiding-Under the guidance of an authorized trainer with Certificate **10 Marks**

5. Yoga Education - Under the guidance of a formally trained yoga expert with certification from the concerned institution. **10 Marks**

## Semester-VIII

| S.N. | Name of Subject | Paper | Course Title. | Marks | Credits |
|---|---|---|---|---|---|
| 1. | Chemistry | 801 | *PHYSICAL CHEMISTRY*<br>Practical | 75<br>25 | 3<br>1 |
| 2. | Physics. | 801 | *RELATIVITY AND ELECTRODYNAMICS*<br>Practical | 75<br>25 | 3<br>1 |
| 3. | Mathematics. | 801 | *Mechanics – I*<br>*Mechanics – II* | 100 | 4 |
| 4. | Botany | 801 | *PLANT PHYSIOLOGY AND BIOCHEMISTRY*<br>Practical | 75<br>25 | 3<br>1 |
| 5. | Zoology | 801 | *Ecology and Behaviour*<br>Practical | 75<br>25 | 3<br>1 |
| | Pedagogy Related (B.Ed) | 806 & 807 | Any Two o the following elective papers(specialization)<br>A- Human Rights, Non Violence and Peace Education<br>B- Special Education<br>C -Elementary Education<br>D- Educational and Vocational Guidance E -Value Education | 100<br>100 | 4<br>4 |



# SEMESTER I

## CHEMISTRY

***101 INORGANIC CHEMISTRY*** ***MAX. MARKS: 75***

**Unit I:** Chemical Bonding-Covalent bond Valence bond theory and its limitation, Directional characteristics of covalent bond,Hybridizations-sp,sp2, sp3, dsp2, sp3d, dsp3, sp3d2 and d2sp3 with suitable examples.Shapes of inorganic molecules and ions. Valence shell election pair repulsion (VSEPR) theory and its application to study the geometryof NH3,H2O, H3O+, SF4, ICl2-, ClF3, ICl4-, XeF4, XeF6, molecules. Molecular orbital theory and molecular orbital diagrams for homo and heterodiatomic molecules-H2, H2+,He2+,H, He+,Li2, Be2, B2, C2, N2, O2, F2, O 2+, O2-, O2 2-,O 22+ ,COand NO.Bonding in diborane (3 c-2e bonding).

**UNIT II:** Chemical Bonding- Ionic Bond Lattice energy and Born-Haber cycle.Solvation energy, solubility of ionic solids, Fajan's rule,polarizing power and polariziblity of ions.Structures of ionic solids, radius ratio effect and co-ordination number. Limitations of radius ratio rule.Hydrogen bonding and vander-waal's forces of attractions.

**UNIT III:** S-Block elements-Periodicity in properties of alkali and alkaline earth metals.Compexation tendency, Salvation tendency, stability and solubilities of carbonates, bicarbonates and sulphates of Magnesium and Calcium, Synthesis and applications of important hydrides: NaH, NaBH4, LiH, LiBH4,LiAlH4and CaH2.

Cement: Composition and types of Cement, Manufacture of Portland cement.

Lime: Industrial preparation, Properties and Uses.

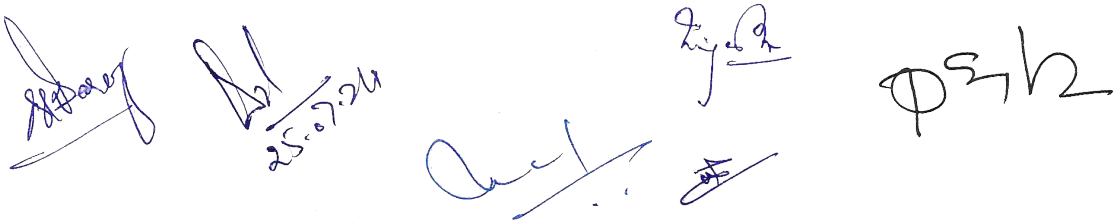
**UNIT IV:** P-Block elements-Periodicity in properties of III A, IV A, V A, VI A and VII A group elements.Silicates, oxides of nitrogen, phosphorous and sulphur- their structure and preparations.Glass: Types and properties of glasses, coloring agents, Industrial manufacturing of glass.Nitrogen fixation-Natural and Artificial fixation.Role of nitrogenase in biological nitrogenfixation.

**UNIT V:** Qualitative Analysis-Theoretical basis of qualitative analysis, Systematic analysis of Acidic and Basic radicals(including interfering radicals). Chemical reactions involved.

Common- ion effect, solubility product & their applications.Oxidizing and reducing agents and buffers used in analysis.

***Books Recommended:***


1. Inorganic Chemistry by SatyaPrakash
2. Inorganic Chemistry by R.C. Agarwal
3. Inorganic Chemistry by B.R. Puri and L.R. Sharma
4. Inorganic Chemistry by P.L. Soni
5. Inorganic Chemistry by G.C. Shivhare and V.P. Lavania
6. Practical Chemistry by Giri, Bajpai and Pandey**.**

# PHYSICS

***101-MECHANICS*** ***MAX. MARKS: 75***

**Unit I:** Frames of Reference: Inertial frames, Galilean transformations, Non-inertial frames, fictitious forces, Displacement, Velocity and acceleration in rotating coordinate systems and their transformations, Coriolis force, Focault's pendulum, Motion relative to earth. Centre of Mass, collision of particles in laboratory and C.M. frame.

**Unit II:** Special Theory of Relativity: Invariance of c, Michelson-Morley Experiment, Lorentz transformations, addition of velocities, time dilation and length contraction, conservation of momentum in collision at relativistic speeds and variation of mass with velocity, relativistic energy, mass-energy equivalence, work and energy, transformation equations for momentum, energy and rateof change of momentum.

**Unit III:** Oscillations: Qualitative idea of oscillations in an arbitrary potential well, General differential equation for the harmonic motion, mass on a spring, oscillation of two masses connected by a spring, reduced mass, coupled oscillations, normal modes, normal coordinates of two linear coupled oscillators, damped harmonic motion, Forced oscillations and resonances, Resonance width and quality factor.

**Unit IV:** Waves: General differential equation of one dimensional wave motion and its solution, plane progressive harmonic wave, differential calculus methods for speed of transverse waves on a uniform string and for that of longitudinal waves in a fluid, energy density and energy transmission in waves, superposition of waves, group and phase velocity.

Fourier series, Fourier analysis of square and saw-tooth waves.

**Unit V:** Rigid Body Dynamics: Equation of motion of a rotating body, angular momentum of a rigid body, inertial coefficient and idea of principal axes, case of j not parallel toω, kinetic energy of rotation.

Elasticity : Young modulus, Bulk modulus and modulus of rigidity, Poisson ratio, relation between elastic constants, Theory of bending of a beam and torsion of a cylinder, experimental determination of by loading a beam in the middle and of η by static and dynamic methods, Searle's two bar experiment.

**Books suggested**

Berkeley: Physics Course, Vol. I, Mechanics, Tata McGraw Hill, New Delhi.

Berkeley: Physics Course, Vol. III, Waves and Oscillations, McGraw Hill, New Delhi.

A. P. French: Physics of Vibration and Waves.

Alonso and Finn: Fundamental University Physics, Vol. I, Mechanics.

R. S. Gambhir: Mechanics, CBS Publishers.

J.C. Upadhyaya: Mechanics, Ram Prasad & Sons, Agra.

# MATHEMATICS

***101 Algebra and Co-ordinate Geometry of Two Dimensions*** ***MAX. MARKS: 100***

**Unit I:** The characteristic equation of a matrix, Eigen values and Eigen vectors, Cayley-Hamilton theorem and its use in finding the inverse of a matrix. Inequalities. Continued fractions.

**Unit II:** Relations between the roots and coefficients of general polynomial equations in one variable,Symmetric functions of roots Transformation of equations. Descarte's rule of signs. Solution of

cubic equations (Cardon's method). Biquadratic equations (Ferrari's Method).

**Unit III**: Infinite series. Convergent series, tests for convergence of a series, comparison test, D'Alembert's Ratio test, Cauchy's root test, Logarithmic Ratio Test. Raabe's test, De Morgen and Bertrand's test, Cauchy's condensation test, Gauss's test. Alternating series, Leibnit'z test (Derivation of above tests not required).

**Unit IV:** Polar equation of a conic, polar equations of tangent, normal, asymptotes, chord of contact, auxiliary circle, director circle of a conic and related problems.

**Unit V :** General equation of second degree. Tracing of conics (Cartesian coordinates).

**SUGGESTED BOOKS**

M. Ray : A Text Book of Higher Algebra, S.Chand & Co., New Delhi

Bansal, Bhargva, Agarwal : Algebra (Hindi Ed.), Jaipur Publishing House, Jaipur.

Bansal, Bhargava : 2-D Coordinate Geometry (HindiEd) Jaipur Publishing House, Jaipur.

Sharma, Varshney : Coordinate Geometry, Pragati Prakashan, Meerut.

Gokhroo, Saini, Oza : 2-D Geometry (Hindi Ed. ), Navkar Publication, Ajmer.

# BOTANY

***101-ALGAE, LICHENS AND BRYOPHYTES*** ***MAX. MARKS: 75***

**Unit I:** General characters, Classification and economic importance of Algae. Important features and life history of Chlorophyceace and Charophyceae. Structure and life cycle of Volvox,Oedogonium,Coleochaete and Chara.

**Unit II**: Important features and life history of Xanthophyceae and Phaeophyceae. Structure and life cycle of Vaucheria, Ectocarpus and Sargassum.

**Unit III:** Important features and life history of Rhodophyceae. Structure and life cycle of Polysiphonia.Lichens: Morphology and structure of the two components; biological, ecological and economic importance. Vegetative multiplication methods with special reference to Parmelia and Usnea.

**Unit IV**: Bryophytes: General characters, alternation of generations and classification. characters and classification of Hepaticopsida. Morphology and life history of Riccia, Marchantia and Plagiochasma.

**Unit V:** Characters and classification of Anthocerotopsida and Bryopsida. Morphology and life history of Anthoceros and Sphagnum.Suggested Laboratory Exercises-

Algae: Microscopic preparation and study of following algal materials: Volvox, Oedogonium,Coleochaete, Vaucheria, Chara, Ectocarpus, Sargassum and Polysiphonia

Lichens: Study of Lichens

Bryophytes: Study of external morphology and microscopic preparations of following

Bryophytes: Riccia, Marchantia, Plagiochasma, Anthoceros and Sphagnum

**Suggested Readings**

Bold, H.C., Alexopoulous, C.J. and Delevoryas, T. Morphology of Plant and Fungi (4th Ed.)Harper & Foul Co., New York, 1980.

Ghemawat, M.S., Kapoor, J.N. and Narayan, H.S. A Text book of Algae, Ramesh Book Depot,Jaipur, 1976.

Gilbert, M.S. Cryptogamic Botany, Vol. I & II (2nd Ed.), Tata McGraw Hill, Publishing Co.Ltd., New Delhi, 1985.

Kumar, H.D. Introductory Phycology, Affiliated East–West Press, Ltd., New York, 1988.
Pandey, S.N. and Trivedi, P.S. A Text Book of Botany 2000 Volume I, Vikas Pub. House Pvt.Ltd., New Delhi.
Puri, P. Bryophytes, Atmaram & Sons, Delhi, Lucknow, 1985.
Singh, V., Pande, P.C. and Jain, D.K.A Text Book of Botany, Rastogi & Co., Meerut, 2016.
Vashista, B.R. Botany for Degree Students (Algae, Fungi Bryophyta), S. Chand & Co. Ltd., New Delhi,2016.

## ZOOLOGY

***101 Animal Diversity and Evolution*** ***MAX. MARKS: 75***

Functional morphology of the types included with special emphasis on the adaptations to their modes of life and environment. General characters and classifications of all invertebrate phyla up to class with examples emphasizing their biodiversity, economic importance and conservation measures where required.

**Unit I:** General principles of taxonomy, concept of the five-kingdom, Concept of Protozoa,Metazoa and Levels of organization. Basis of classification of non-chordata:Symmetry, coelom, segmentation and embryogeny, Characters and Classification of Protozoa and Porifera upto classes with examples.

**Unit II:** Salient features and classification of Coelenterata, Ctenophora, Platyhelminthes, Aschelminthes, Annelida, Arthropoda, Mollusca and Echinodermata with their suitable examples.

**Unit III:** Origin of Life, Miller's experiment, Lamarckism and Darwinism, Natural Selection,genetic basis of evolution, speciation, Evidences of organic evolution.

**Unit IV:** Variations, Isolation and Adaptations, Geological time scale and animal distribution indifferent era.

**Unit V:** Principal zoogeographical regions of the world with special reference to their mammalian fauna, Factors affecting the large scale animal distribution, Origin and evolution of man.

# SEMESTER II

## CHEMISTRY

***201 Organic Chemistry*** ***MAX. MARKS: 75***

**Unit I:** Mechanism of Organic Reactions: Classification of organic compounds their general characteristics. Types of reagents –electrophiles andnucleophiles.Types of organic reactions.Reactive intermediates –carbocations, carbanions, free radicals, carbenes, arynes and nitrenes (with examples).Assigning formal charges on intermediates and
other ionic species.Methods of determination of reactions mechanism (product analysis, intermediates,isotope effects, kinetic and stereochemical studies).

**Unit II:** Stereochemistry of Organic Compounds Concept of isomerism.types of isomerism
Optical isomerism – elements of symmetry, molecular chirality, enantiomers, stereogenic center,optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centers, diastereomers, threo and erythrodiastereomers, meso compounds, resolution of enantiomers,inversion,retention and racemization. Relative and absolute configuration, sequence rules, D & L and R & S systems of nomenclature.

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

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

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

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

Nomenclature, structure and bonding in alkynes. Methods of formation.Chemical reactions of alkynes,acidic nature of 1-alkynes.Mechamism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation, oxidation and polymerization.

**Unit IV:** Arenes and Aromaticity,Nomenclature of benzene derivatives.Arylgroup.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 ofα and πcomplexes.Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel-Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientationand ortho/pararatio.Side chain reactions of benzene derivatives.Birch reduction.

Methods of formation and chemical reactions of alkylbenzenes. Structure, preparation andproperties of

naphthalene.

**Unit V:** Alkyl and Aryl Halides: Nomenclature and classes of alkyl halides, methods of formation, chemical reactions.Mechanisms of nucleophilic substitution reactions of alkyl halides, SN2 and SN1 reactions with energy profile diagrams.Mechanism of elimination reactions of alkyl halides, regioselectivity in dehydrohalogenation,Saytzeff rule.

Methods of formation of aryl halides, nuclear and side chain reactions.Theadditionelimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vsallyl, vinyl and aryl halides towards nucleophilicsubstitution reactions.Synthesis and uses of DDT and BHC.

***Books Recommended:***

1. Advanced Organic Chemistry by Mukheri and Kapoor Vol. I & II
2. A Text Book of Organic Chemistry by M.K. Jain
3. A Text Book of Organic Chemistry by R.K. Bansal
4. Organic Chemistry, R.T. Morrison and R.N.Boyd, Prentice-Hall

***Practicals*** ***MAX. MARKS: 50***

Laboratory Course

*Qualitative analysis*

Qualitative analysis of inorganic mixture, containing 5-radicals.Cation analysis, separation and identification of ions (group 0, I, II, III, IV, V and VI). Interfering radicals mixtures and special combination of acidic radicals

*Volumetric analysis*

Redox Titrations:

(i) To determine the strength of given unknown copper sulphate solution iodometrically using starch as indicator.

(i)To determine the strength of given unknown potassium dichromate solution iodometrically using starch as indicator.

*Viva-Voce*

**Books Suggested (Laboratory Courses):**

1. Practical Chemistry S.Giri, D.N.Bajpai and O.P.Pandey Publ. S. Chand
2. Practical Chemistry, K.M. Gangotri, R.B.D. Jaipur

## PHYSICS

***201 OPTICS*** ***MAX. MARKS: 75***

**Unit I:** Geometrical Optics: Axial, Lateral and angular magnifications and their inter-relationship,Abbe's Sine condition for spherical surfaces, Aplanatic points for a spherical refracting surface.

Focal length of two thin lenses separated by a distance, Cardinal points of a co-axial lens system,properties of cardinal points, construction of image using cardinal points, Newton’s formula and otherrelations for a lens system using cardinal points, Ramsden's and Huygen's eye pieces, their cardinal points, and relative merits.

**Unit II:** Interference: Division of Amplitude-Interference exhibited by thin film, Production of colours in thin films, Wedge-shaped film, Newton's rings and determination of wavelength and

refractive index of a liquid by Newton's rings.
Michelson Interferometer: Measurement of wavelength and difference between two close wavelengths.
Fabry-Perot interferometer: Intensity Distribution, Co-efficient of sharpness and half width, measurement of wavelength.

**Unit III:** Lasers: Population inversion, laser as source of coherent radiation, Basic principles of HeNe Laser and Ruby Laser.

Diffraction: Fresnel's class of diffractions, Zone Plate, Phase reversal Plate, Cylindrical wave front and its effect at an external point and geometrical construction, diffraction at a straight edge; thin wire, rectangular slit and circular aperture.

**Unit IV:** Fraunhofer class of diffraction: Amplitude and phase due to a number of SH Motions acting on a particle simultaneously, Diffraction at two slits and intensity distribution, Diffraction at N slits.Plane Transmission Grating: Theory and formation of spectra, width of principal maxima, absent spectra, overlapping of spectral lines, number of spectra, measurement of wave-length of light,
Rayleigh's criterion, Resolving Power of a Prism, Telescope, Microscope and plane transmission grating.

**Unit V:** Polarization: Double refraction, production of plane polarized light by double refraction,Nicol Prism, Double refraction in uniaxial crystals, Huygen's explanation of Double Refraction, Plane,circular and elliptically polarized light, Half-wave and quarter-wave plates, production and detection of plane, circularly and elliptically polarized light by Nicol Prism and Quarter-wave plate.Rotatory Polarization, Fresnel's explanation, specific rotation, half shade and BiquartzPolarimeter,determination of specific rotation and strength of sugar solution.

***Books suggested*:**

Jenkins and White: Optics, McGraw Hill.
Ghatak A.K.: Optics, Tata McGraw Hill.
Khandelwal D.P.: Optics and Atomic Physics, ShivlalAgarwal& Co.
Subramanayam and Brijlal: A text book of Optics, S.Chand New Delhi.

***EXPERIMENTS FOR PRACTICAL WORK*** ***MAX. MARKS: 50***

Note: Any 15 experiments to be performed by all the students out of following list.

1. Study of bending of a beam and determination of Young's modulus.
2. Modulus of rigidity by statical method using horizontal apparatus.
3. Modulus of rigidity by statical method using vertical apparatus.
4. Elastic constants by Searle's method.
5. Nodal slide, determination of cardinal points of a combination of two lenses.
6. Formation of spectrum, prism spectrometer and determination of dispersive power of the material of a prism.
7. Wavelength of light by Newton's rings.
8. Wavelength of light by plane transmission grating.
9. Wavelength of light by biprism.
10. Specific rotation by polarimeter.
11. Resolving power of telescope.
12. To determine the Poisson's ratio of a rubber tube.
13. Determination of surface tension of water by Jagger's method.
14. Resolving power of a plane transmission grating.

15. To determine the polarizing angle for the glass prism surface and to determine the refractive index of material of prism using Brewster's law.
16. Modulus of rigidity by dynamical method using Hollow Maxwell needle.
17. Modulus of rigidity by dynamical method using Solid Maxwell needle.
18. Verification of Malus law.
19. Determine the thermodynamic constant = Cp Cvγ using Clement and Desormes method.
20. Verification of Rutherford and Soddy's law of radioactive disintegration using dices and statistical Board.
Note: - New experiments may be added on availability of equipments

## MATHEMATICS

***201 Calculus*** ***MAX. MARKS: 100***

**Unit 1**: Polar Co-ordinates. Angle between radius vector and the tangent. Angle between curves in polar form. Length of polar substangent and polar subnormal, Pedal equation of a curve, Derivatives of an arc, curvature, various formulae, Centre of curvature and chord of curvature and related problems.

**Unit2**:Partial differentiation, Euler's theorem on homogeneous functions, chain rule of partial differentiation, Maxima and Minima of functions of two independent variables and of three variables connected by a relation, Lagrange's Method of undetermined multipliers.

**Unit 3:** Asymptotes, double points, curve tracing, Envelopes and evolutes.

**Unit 4:** Theory of Beta and Gamma functions. Rectification. Volume and Surfaces of solids of revolution.Differentiation and integration under the sign of integration.

**Unit 5:** Evaluation of double and triple integrals and their applications in finding areas and volumes. Dirichlet's integral. Change of order of integration and changing into polar co-ordinates.

***SUGGESTED BOOKS***

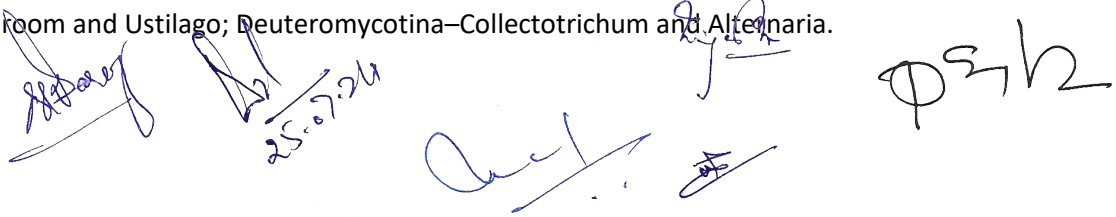
Gorakh Prasad: A Text Book of Differential Calculus; Pothishala Pvt.Ltd.Allahabad
Bansal, Bhargava and Agarwal : A Text Book of Differential Calculus II (Hindi Ed.) and Integral Calculus, Vol. II(Hindi Ed.); Jaipur Publishing House, Jaipur
Gokharoo, Saini : Differential Calculus (Hindi Ed.); Navkar Prakashan, Ajmer.
Tandon, O.P. and Sharma, K.C. : Integral Calculus; Jaipur Publishing House, Jaipur
Gupta, Juneja and Tandon : Differential Calculus (English Ed.);Ramesh Book Depot,Jaipur.
Gorakh Prasad : Integral Calculus; Pothishala Pvt.Ltd.Allahabad.

## BOTANY

***201 MYCOLOGY, MICROBIOLOGY AND PHYTOPATHOLOGY*** ***MAX. MARKS: 75***

**Unit I:** General characters, classification and economic importance of fungi. Important features and life history of Mastigomycotina–Pythium and Albugo; Zygomycotina–Rhizopus; Ascomycotina–Saccharomyces, Aspergillus and Penicillium.

**Unit II:** Important features and life history of Basidiomycotina– Puccinia, Agaricus and wild Mushroom and Ustilago; Deuteromycotina–Collectotrichum and Alternaria.



**Unit III:** Viruses: Chemical and physical nature; Structure, multiplication and transmission of plant viruses; Tobacco mosaic virus and yellow vein mosaic virus disease. General account of Viroids, AIDS and Prions.

**Unit IV:** Bacteria–Structure, nutrition, cell division, reproduction and economic importance. Biofilms and Quorum sensing in microbes.Cyanobacteria–Life history of Nostoc and Oscillatoria; Nitrogen fixation – by BGA (Blue green algae). General account and biology of Mycoplasma and Phytoplasma.

**Unit V:** Causes and symptoms of plant diseases with special reference to green ear disease of Bajra, smut of wheat, citrus canker, little leaf of brinjal and root knot disease. A brief account of principles of plant protection.

***Suggested Laboratory Exercises*/PRACTICAL** ***MAX. MARKS: 50***

Microscopic preparation and study of following fungal materials: Albugo, Rhizopus, Saccharomyces,Aspergillus, Penicillium, Ustilago, Agaricus, local Mushroom¸ Colletotrichum and Alternaria.

Viruses: Study of disease symptoms caused by Tobacco mosaic virus and yellow vein mosaic virus.

Bacteria: Gram staining of bacteria. Nostoc, Oscillatoria and study of bacteriological specimens.

***Study of symptoms of following diseases: (specimen or photographs)***

Green ear disease of bajra

Smut of wheat

Citrus canker

Rust of wheat

Little leaf of bringal

Root knot nematode.

***Suggested Readings***

Alexopoulos, C.J. and Mims.Introductory Mycology, John Wiley and Sons, New York, 2000.

Bilgrami, K.S. and Dube, H.C. A Text Book of Modern Plant Pathology, Vikas Publ. House, New Delhi, 1976.

Biswas, S.B. and Biswas, A. An Introduction to Viruses, Vikas Publ. House, New Delhi, 2000.

Clifton, A. Introduction to Bacteria, McGraw Hill Co., New York, 1985.

Dube, H.C. Fungi, Rastogi Publication, Meerut, 1989.

Kaushik, P. Microbiology, Emkay Publication, 2001.

Madahar, C.L. Introduction to plant viruses, S. Chand & Co. Ltd., New Delhi, 1978.

Palezer, Chan and King. Microbiology, McGraw Hill Book Co., London, 1995.

Pathak, V.N. Fundamentals of Plant Pathology, Agro Botanica. 2000.

Purohit, S.S. Microbiology, Agro. Bot. Publication, Jodhpur, 2002.

Sharma, O.P. Fungi, Today and Tomorrow Publication, 2000.

Sharma, P.D. Microbiology and Plant Pathology, Rastogi Publ. Meerut, 2003.

Singh, V. and Srivastava, V.Introduction to Bacteria, Vikas Publication, 1998.

Vashista, B.R. Botany for Degree student Fungi, S. Chand & Co., New Delhi, 2016.

# ZOOLOGY

***201 Biology of Nonchordates*** ***MAX. MARKS: 75***

**Unit 1:** Euglena: Ultrastructure of flagellum and flagellar movement, osmoregulation and behaviour, reproduction.

Paramecium: Locomotion, nutrition, osmoregulation and reproduction. Sycon: Cellular organization, canal system, reproduction and development.

**Unit 2**: Obelia: Structure of polyp and medusa, sense organs and reproductive systems, life cycle.

Fasciola: Digestive, excretory and reproductive systems, developmental stages and life cycle.

Taenia: Structure of body wall, excretory and nervous systems, reproduction and developmental stages in life cycle.

**Unit 3:** Nereis: Parapodial locomotion, digestive, blood vascular, excretory, nervous and reproductive systems, development and metamorphosis.

Hirudinaria: Digestive, haemocoelomic, excretory, nervous and reproductive systems, sense organs.

**Unit 4:** Palaemon: Appendages, Digestive, respiratory, blood – vascular, excretory, nervous, sense organs and reproductive systems.

Pila: Digestive, respiratory, blood vascular, nervous and reproductive systems, sense organs

**Unit 5**: Lamellidens: Digestive, respiratory, blood–vascular, excretory and nervous systems, sense organs, reproduction and development.

Asterias: Water – vascular system, digestive, circulating and nervous systems, sense organs, reproduction, life history and regeneration.

***PRACTICALS*** ***MAX. MARKS: 50***

1. Dissection/demonstration of dissection [Major]:

Palaemon: Study of appendages, general anatomy, digestive and nervous systems Pila: General anatomy and nervous system

Lamellidens / Unio: General anatomy and nervous system

2. Permanent preparations / Minor dissections of the following: Protozoa: Paramecium Porifera: Sponge spicules, fibres and gemmules Coelenterata: Obelia colony, Obelia medusa Annelida: Nereis parapodia

Arthropoda: Palaemon: Statocyst and hastate plate along with comb plates, Cyclops and Daphnia

Mollusca: Pila: Gill lamella, radula and L. S. Osphradium, Lamellidens: Gill-lamella

3. Identification, systematic position up to order and general study of the following animal forms, microscopic slides / museum specimens:

Protozoa: Amoeba, Entamoeba, Euglena, Noctiluca, Trypanosoma, Trichomonas, Foraminifera (Oozes), Opalina, Balantidium, Nyctotherus, Paramecium, Paramecium binary fission and conjugation and, Vorticella [Whole mounts].

Porifera: Leucosolenia, Grantia, Scypha, Hyalonema, Euplectella, Spongilla and

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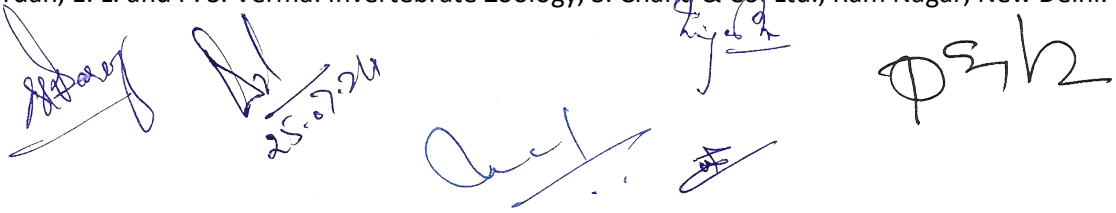
Euspongia
Coelenterata: Obelia (colony and medusa), Physalia, Porpita, Aurelia, Rhizostoma, Alcyonium, Corallium, Gorgonia, Tubipora, Pennatulla and Madrepora
Ctenophora: Beroe
Platyhelminthes: Dugesia, Fasciola and Taenia
Nematoda: Ascaris, Ancylostoma, Dracunculus, Wuchereria, Trichinella, Schistosoma and Enterobius
Annelida: Nereis, Phase Heteronereis, Aphrodite, Arenicola, Pheretima, Pontobdella, Branchellion and Hirudinaria
Onychophora: Peripatus
Arthropoda : Limulus, Araneus, Palamnaeus, Apus, Lepas, Balanus, Sacculina, Palaemon, Lobster, Eupagurus, Carcinus, Lepisma, Odontotermes, Pediculus, Schistocerca, Papilio, Bombyx, Xenopsylla, Apis, Julus and Scolopendra
Mollusca: Chiton, Dentalium, Patella, Pila, Turbinella, Aplysia, Slug, Snail, Mytilus, Ostrea (pearl oyster), Lamellidens, Teredo, Nautilus, Sepia, Octopus Enchinodermata: Pentaceros, Asterias, Ophiothrix, Echinus, Holothuria and Antedon
4. Study of sections, developmental stages and isolated structures from microscopic slides
Porifera: L. S. and T. S. of Scypha / Grantia
Coelenterata: Hydra, Sections of Hydra, Developmental stages of Aurelia
Platyhelminthes: Transverse sections of Dugesia, Fasciola and Taenia, mature and gravid proglottids of Taenia, developmental stages of Fasciola and Taenia Annelida: Transverse sections of Nereis and Hirudinaria, Trochophore larva of Nereis, arapodium of Nereis and Heteronereis.
Arthropoda: Crustacean larvae (Nauplius, Zoea, Megalopa and Mysis), mosquito larva & pupa. Mollusca: Transverse sections of Lamellidens and Glochidium larva
Echinodermata: Pedicellariae of Star fish
*Each regular student is required to keep a record of practical work done by him/her duly checked by the teachers which will be submitted at the time of practical examinations.

***Recommended Books (All latest editions***)

1. Prasad, Beni: Pila, Lucknow Publishing House, Lucknow.
2. Bhatia, M. L.: Hirudinaria, Lucknow Publishing House, Lucknow.
3. De Robertis, E. D. P. and De Robertis, E. M. F.: Cell and Molecular Biology, Halt Saunder,Tokyo,Japan.
4. Gardner, E. J.: Principles of Genetics, John Wiley & Sons, New York.
5. Kotpal, R. L. :Invertebrates, Rastogi Publications, Meerut.
6. Nigam, H. C. :A University Course in Invertebrate Zoology, Vol. I, Mc Milan, London.
7. Prasad, S. N. :Text Book of Invertebrate Zoology, KitabMahal, Allahabad.
8. Patwardhan, S. S. :Palaemon, Lucknow Publishing House, Lucknow.
9. Reese, A. M. :Outlines of Economic Zoology, Blackiston Co., Philadelphia, U.S.A.
10. VishwaNath :A Text Book of Zoology, Vol. I, Invertebrate, S. Chand & Co., New Delhi.
11. Rastogi, Veerbala :Invertebrate Zoology, KedarNath Ram Nath, Delhi.
12. Jordan, E. L. and P. S. Verma: Invertebrate Zoology, S. Chand & Co. Ltd., Ram Nagar, New Delhi.



# SEMESTER III

## CHEMISTRY

***301 Inorganic Chemistry and Physical Chemistry*** ***MAX. MARKS: 75***

**Unit I: Chemistry of Transition Elements**

General characteristics and Periodicity in properties with emphasis on their electronic configuration and multiple oxidation states of 3d, 4d and 5d series elements.Coloured ion formation, magnetic,catalytic properties and complex formation tendency in 3d series elements.

**Coordination compounds**

Werner's coordination theory and experimental verification, Effective Atomic Number concept,chelates, nomenclature of coordination compounds, stereoisomerism in complexes of coordination number 4 and 6.Complexometric titrations and theory of metallochrome indicators.

**Unit II: f-Block elements**

Chemistry of Lanthanides: Electronic structure, oxidation state, ionic radii, colours, spectral and magnetic properties. Lanthanide contraction and its consequences.Chemistry of actinides: General characteristics, comparative treatment with lanthanides in respect to ionic radii, oxidation states, Magnetic behaviour and spectral properties.

**Concepts of acids and bases:**

Arrhenius, Bronsted-Lowry, Lewis and Usanovichconcept.Acid base titrations and theory of indicators, Redox titrations.

Non aqueous solvents: Physical properties of solvent, types of solvents and their general characteristics. Reactions in non-aqueous solvents with reference to liquid $NH_3$ and liquid $SO_2$.

**Unit III : Quantitative analysis**

Types of quantitative analysis: Gravimetric and volumetric analysis.

Precipitation, Co-precipitation and Post precipitation.

Errors in chemical analysis: types of error and their minimization; Accuracy, Precision, Standard Deviation.

**PHYSICAL CHEMISTRY**

**Unit IV: Mathematical Concepts**

Logarithmic relations, curve sketching, linear graphs and calculation of slopes, differentiation of functions like ax, ex,xn, sin x, cos x, tan x, log x; maxima and minima, partial differentiation.Integration of some useful functions; like xn,1/ X, ex, constant, sin x, cos x, integration by parts. Permutations and combinations.Probability.

**Gaseous State**

Deviation from ideal behavior, Vander Waals equation of state and its discussion. Critical Phenomena: PV isotherms of real gases, continuity of states, relationship between critical constants and Vander Waals constants, the law of corresponding states, reduced equation of state. Molecular velocities: Root mean square, average and most probable velocities(No derivation). Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Liquification of gases (based on Joule-Thomson effect).Numericals

**Liquid and Colloidal State**

Liquid State: Intermolecular forces, structure of liquids (a qualitative description). Structural differences

between solids, liquids and gases. Liquid crystals: Classification-nematic, smectic and cholestric phases. Theory of liquid crystal (Swarm theory). Colloidal State: Definition of colloids, classification of colloids. Solids in liquids (sols): properties – kinetic, optical and electrical; stability of colloids, Hardy-Schulze law, protective action, Gold number. Liquids in liquids (emulsions): types of emulsions, preparation, Emulsifier, Theory of Emuloion. Liquids in solids (gels): classification, preparation and properties, imbibitions and syncresis.General applications of colloids.

**Unit V: Solutions**

Types of liquid mixtures, ideal and non-ideal mixtures, vapour pressure of liquid mixtures,distillation of immiscible liquid mixtures.Partially miscible liquids-phenol-water, triethylamine-water, nicotine-water-systems, consolute temperature-lower and upper, Effect of impurity on consolute temperature- Phenol-water system, immiscible liquids, Principal and Methodology of steam distillation. Numericals

**Chemical Kinetics**

Rate, order, molecularity and stoichiometry of a reaction, Derivation of Integrated rate lawand characteristics of zero, first and second order reactions, Pseudo-first order reaction,Determination of the order of reaction-differential method, method of integration(hit andtrial method), half-life method and isolation method. Theories of Reaction Rate: Simple collision theory and its limitations, transition statetheory (equilibrium hypothesis) and derivation of the rate constant, Thermodynamicalformulation of rate constant, Comparison of collision theory and transition state theory,Numericals.

***Books Recommended:***

1. Inorganic Chemistry by SatyaPrakash
2. Inorganic Chemistry by B.R. Puri& L.R. Sharma
3. Inorganic Chemistry by SangeetaLoonker , Ramesh Book Depot, Jaipur
4. The Eelements of Physical Chemistry, P.W. Atkins, Oxford.
5. Physical Chemistry Through problems, S.K. Dogra and S. Dogra, Wile Eastern Ltd.
6. Principles of Physical Chemistry, B.R. Puri, L.R. Sharma and M.S. Pathania, ShobhanLalNaginchand& Co.
7. Physical Chemistry, Bahl and Tuli, S. Chand & Co.(P) Ltd.
8. Physical Chemistry, Vol. I & II, S. Pahari, New Central Book Agency (P) Ltd

## PHYSICS

***301 ELECTROMAGNETICS & STATISTICAL AND THERMAL PHYSICS*** ***MAX. MARKS: 75***

**Unit I:** Vector Fields: Scalar and Vector fields, gradient of a scalar field, divergence of vector fieldand their physical significance, curl of vector field, line integral of vector field, surfaceintegral and flux of a vector field. Gauss law, its integral and differential form, statement andexplanation of Gauss theorem and Stokes theorem.

Electrostatics: Potential and field of an arbitrary charge distribution, concept of multipoles,Potential & field due to a dipole and quadrupole, torque on a dipole in an electric field. Electrostatic energy of a uniformly charged sphere.Classical radius of an electron. Electric field in matter: Atomic and molecular dipoles, polarizability, permanent dipole moment, Dielectrics, polarization Vector, capacity of parallel plate condenser with partially or completely filled dielectrics, electric displacement and Gauss Law in

general form, electrostatic energy of a charge distribution in dielectrics. Lorentz local field and Clausius-Mossotti equation.

**Unit II:** Electrostatic fields: Conductors in an electric field, boundary condition for potential, boundary conditions for electrostatic field at electric surface, uniqueness theorem, method of images and its application for system of point charge near a grounded conducting plane. Poisson's and Laplace equation in Cartesian, cylindrical and spherical polar coordinates (without derivation). Solution of Laplace equation in Cartesian coordinates, potential at a point inside a rectangular box.

Magnetics: Biot-Savart law, Ampere circuital law in integral and differential forms, divergence of B field, Force on a current carrying wire and torque on a current carrying loop in magnetic field. Magnetic field in matter: Magnetization Vector, uniform magnetization and surface current, nonuniform magnetization, B,M,H Vectors and their inter-relations, Bohr magneton, orbital magnetic moment and angular momentum, Electron Spin and Magnetic moment, Magnetic Susceptibility.

**Unit III** :Electromagnetic Induction, Faraday's laws of Electromagnetic induction, its integral and differential form; Lenz's law; Self and mutual inductance, measurement of self inductance by Rayleigh method; Energy stored in magnetic field.Transient response: Charge and discharge of condenser through resistance, determination of high resistance by leakage, growth and decay of current in LR circuit; A. C. Circuits, use of j operator in alternating current circuits. LCR circuit in series and in parallel (A.C.), phase diagram, Resonance and Q factor, Sharpness of resonance.

**STATISTICAL AND THERMAL PHYSICS**

**Unit IV:** Statistical Method: Particle States, distribution of particles in two particle states, Probabilityof a given distribution, distribution corresponding to maximum probability, relative probability curve with increasing number of particles, binomial distribution, Standard deviation, micro-states and macrostates of a system, principle of equal 'a priori' probabilities, equilibrium state, fluctuations,reversibility and irreversibility, States of a particle inside a box, number of accessible states between an infinitesimally small energy interval, momentum interval, phase space, statistical weight of a configuration of a macro state, indistinguishable and distinguishable particles, entropy and principle of increase of entropy, statistical ensemble, time and ensemble averages; Thermal interaction between two systems, zeroth law of thermodynamics, concept of temperature.

Unit II: Canonical ensemble, Boltzmann canonical distribution, partition function, a two state system, paramagnetic susceptibility, heat capacity, Boltzmann formula for entropy, average energy and fluctuations, free energy, adiabatic interaction, enthalpy, general interaction, Gibbs free energy, first law of thermodynamics, phase transitions, Clausius-Clapeyron equation. Ideal Classical Gas, Maxwell velocity and speed distributions, partition function, entropy (SackurTetrode relation), Gibbs paradox; equation of state, ideal gas temperature scale, Vander-Waal's equation of state; heat capacities of monatomic and diatomic gases, ortho and para hydrogen.

**Unit V**: Systems with variable Energy and Particle Number: Chemical potentials, grand canonical distribution, Partition function, number fluctuations, grand potential, equation of state of an ideal classical gas, Saha's ionization formula, Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein Statistics, Fermi gas at 0K temperature; thermionic emission, strongly degenerate boson gas; BoseEinstein Condensation, liquid helium.

Macroscopic Thermodynamics: Second law of thermodynamics; Carnot cycle, Carnot theorem, thermodynamic temperature scale and its identity with perfect gas temperature scale,

entropy change in isothermal, and adiabatic expansions of an ideal gas; Thermodynamic potentials, Maxwell's equations Cp-Cv, Cp/Cv, Black body radiation, energy density and pressure, Stefan-Boltzmann law, Wien's displacement law, Planck's law.

Temperature changes in Joule and Joule-Thomson expansions, Regenerative cooling, adiabatic demagnetization and production of low temperatures, third law of thermodynamics, negative temperatures. Transport Phenomena: Mean free path, collision cross-sections, mean free time, viscosity, thermal conductivity and self-diffusion.

***Books suggested*:**

Berkeley: Physics Course, Vol. II: Electricity and Magnetism, Tata McGraw Hill.
Spiegel, M.R.: Vector Analysis, Schaum's Outline Series, McGraw Hill.
Laud, B.B.: Electro-magnetics, Wiley Eastern.
Matveev, A.N.: Electricity and Magnetism, Mir Publishers, Moscow.
Griffiths: Introduction to Electrodynamics
Statistical Physics, Berkeley, Vol. 5, McGraw Hill.
Mandl : Statistical Physics, ELBS and Wiley.
Reif : Fundamentals of Statistical and Thermal Physics, McGraw Hill.
C. Kittel and H. Kroemer : Thermal Physics, CSS.
W.G.V. Rosser: An Introduction to Statistical Physics, Elis Horwood.
Lokanathan and Gambhir: Statistical and Thermal Physics, Prentice Hall.

## MATHEMATICS

***301 Co-ordinate Geometry of 3-Dimensions and Vector Calculus & Differential Equations***

***MAX. MARKS: 100***

**Unit I :** Sphere, Cone and Cylinder (Rectangular Coordinates only)

The Central Conicoids (referred to principal axes). Tangents and tangent planes, Polar planes and polar lines, Section with a given centre, Enveloping cone, Enveloping cylinder and related problems.

**Unit II:** Equations of the normal to an ellipsoid, number of normals from a given point to an ellipsoid, Cone through six normals, Conjugate diameter and diametral planes and their properties. Cone as a Central surface. Paraboloids.

Plane Sections of Conicoids, Umbilics, Generating lines of hyperboloid of one sheet and its properties.

**Unit III:** Vector Calculus : Curl, Gradient and Divergence & Identities involving these operators.Theorems of Stoke, Green and Gauss (Statement, application and verification only).

**Differential Equations**

**Unit IV:** Exact and reducible to exact differential equations of first order and first degree. First order higher degree differential equations solvable for x,y,p. Clairaut's form and singular solutions.

Linear differential equations with constant coefficients, Homogeneous linear differential equations with variable coefficients. Simultaneous differential equations, Total differential equations of the form Pdx + Qdy + Rdz = 0, by method of inspection and method for homogeneous equations.

**Unit V:** Series solutions of Second Order Linear differential equations, Power series method, Bessel and

Legendre equations. Partial differential equations of the first order. Lagrange's solution. Some special types of equations which can be solved easily by methods other than the general method. Charpit (general) method of solution.

Partial differential equations of second and higher order. Classification of linear partial differential equations of second order. Homogeneous and non-homogeneous equations with constant coefficients. Partial differential equations reducible to equations with constant coefficients. Monge's method of integrating Rr + Ss + Tt = V.

***SUGGESTED BOOKS***

Gupta, Juneja : Vector Analysis; Ramesh Book Depot, Jaipur.

Gokhroo, Saini, Bhati : Vector Calculus (Hindi Ed.); Navkar Prakashan, Ajmer

Bhargava, Banwari Lal : Vector Calculus (Hindi Ed. ); Jaipur Publishing House, Jaipur

Bell, R.J.T.: Coordinate Geometry of Three dimensions;Macmillan India Ltd., New Delhi

Vasistha, Agarwal : Analytical Solid Geometry; Pragati Prakashn, Meerut

Gokhroo, Saini & Rathi : Analytical 3-D Geometry (HindiEd);Jaipur Pub. House, Jaipur

Bansal, Bhargva, Agarwal : 3-D Coordinate Geometry II; Jaipur Pub. House, Jaipur Sharma, Gupta : Differential Equations; Krishna Prakashan, Meerut

Ray, Chaturvedi : Differential equations; Kedar Nath, Ram Nath & co., Agra.

Bansal, Dhami : Differential equations (Vol. II); Jaipur Publishing House, Jaipur

Gokhroo, Saini, Kumbhat : Differential equations (Hindi Ed.);Navkar Prakashan, Ajmer

Gokhroo, Saini, Oza : Partial differential equations; Jaipur Publishing House, Jaipur.

## BOTANY

***301 PALAEOBOTANY,PTERIDOPHYTES AND GYMNOSPERMS,ECONOMIC BOTANY, ETHENOBOTANY***

***MAX. MARKS: 75***

**Unit I**: Geological time scale, Fossilization. General characters and classification and Pteridophytes. Important characteristics of Psilopsida, Lycopsida, Sphenopsida and Pteropsida.Stelar systems in Pteridophyta. Structure and reproduction in Rhynia.

**Unit II:** Occurrence, structure and life history of Lycopodium, Selaginella and Equisetum. Occurrence, structure and life history of Adiantum, Marsilea and Azolla. Heterospory in Pteridophyta.

**Unit III** Characteristics of seed plants, evolution of the seed habit. General features of gymnosperms and their classification; evolution, diversity and economic importance of

Gymnosperms. Cycas: Morphology of vegetative and reproductive parts, anatomy of root, stem and leaf; Reproduction and life cycle.Pinus and Ephedra: Morphology of vegetative and reproductive parts, anatomy of root,stem and leaf, reproduction and life cycle.

**Unit IV:** Economic Botany, Food plants: Rice, wheat, maize, potato, sugarcane. Fibers: Cotton and Jute. Vegetable oils: Groundnut, mustard and coconut, General account of sources of firewood, timber and bamboos. Beverages: Tea and coffee; Rubber.

**Unit V**: Spices and Condiments: General account. Medicinal plants with special reference to Rajasthan: Aloe, Asparagus, Commiphora, Boswellia, Pedalium, Ziziphus, Haloxylon,Tribulus, Vitex, and Withania.

Ethnobotany: Introduction, methods of Ethnobotanical studies, knowledge ofaboriginals in Rajasthan.

***Suggested Laboratory Exercises***

**Palaeobotany:** Microscopic examination of slides of Rhynia.

**Pteridophytes:** Study of external morphology of Lycopodium, Selaginella, Equisetm, Adiantum,Marsilea and Azolla. Microscopic study of temporary double stained preparations of stem/rhizomeof Lycopodium, Selaginella, Equisetum and Marsilea. Study of temporary single stained microscopic preparations of cone of Selaginella and T.S. of Sporophyll of Adiantum and sections of sporocarp of Marsilea.

**Gymnosperms:** Study of external morphology of plant parts of Cycas: young and old foliage leaf,scale leaf, bulbils, male cone, microsporophyll, megasporophyll and mature seed (if material is not available show photographs). Microscopic temporary double stained preparations of rachis and leaflet of Cycas. Study of T.S. of normal and coralloid root by permanent slides.Study of external morphology of plant parts of Pinus: long and dwarf shoot, male cone; female cone; winged seeds. Microscopic temporary preparation of pollen grains (W.M.) of Pinus. Study through permanent slides T.S. stem: young and old; male/female cone of Pinus.

**Economic Botany:** Food plants: Study of morphology and structure. Simple microchemicals tests of the food storing tissues in rice, wheat, maize, potato and sugarcane. Microscopic examination of starch in these plants (except sugarcane). Fibers: Study of cotton fiber, tests for cellulose. Vegetable oils: study of hand sections of Groundnut, Mustard and Coconut and staining of oils droplets by Sudan III and Sudan Black.

Field visits: To study sources of firewood (10 plants), timber-yielding trees (10 trees) and bamboos. A list to be prepared mentioning special features Medicinal plants & Spices: Black pepper, cloves, cardamom - describe them in briefly. Study of 10 medicinal plants. Write their botanical and common names, parts used and diseases/disorders for which they are prescribed. Beverages & Rubber: Coffee, Tea & Rubber

**Ethnobotany:** Ethobotanically important plants of Rajasthan (Abrus, Leptadenia and Calotropis) Study of habit and structure of whole male and female cone of Ephedra. Microscopic reparation of male and female flowers of Ephedra.

***Suggested Readings***

Bold, H.C., Alexopolous, C.J. and Delevoryas, T. Morphology of plant and fungi (4th ed.), Harper and Foul, Co., New York, 1980.

Gifford, E.M. and Foster, A.S. Morphology and Evolution of Vascular Plants, W.H. Freeman and Company, New York, 1988.

Pandey, S.N., Mishra, S.P., Trivedi, P.S. A Text Book of Botany Vol. II, VikasPub.House Pvt. Ltd., New Delhi 2000.

Raven, P.H. Evert, R.F. and Eichhom, S.C. Biology of plants, (5th ed.), W.H. Reema and Co., Worth Publication, New York, U.S.A., 1999.

Sharma, O.P. Pteridophytes, Today and tomorrow Publication, 2000.

Sporne, K.R. The Morphology of Gymnosperms, B.I. Publ. Pvt., Bombay, Calcutta, Delhi, 1991.

Vashista, P.C. Gymnosperm, S. Chand & Co. Ltd., New Delhi, 2016.

Vashista, P.C. Pteridophyta, S. Chand & Co. Ltd., New Delhi, 2016.

Wilson, N.S. and Rothewall, G.W.Palaeobotany and evolution of Plants, (2nd ed.), Cambridge University Press, U.K., 1993.

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Kocchar, S.L. Economic Botany in Tropics. 2nd ed. Mac-millan India Ltd., New Delhi, 1998.
Sambamurthy, A.V.S.S. and Subramanyam, N.S. A Text book of Economic Botany, Wiley Eastern Ltd., New York, 1989.
Sharma, O.P. Hill's Economic Botany (Late Dr. A.F. Hill, Adapted by O.P. Sharma), Tata McGraw Hill Co., Ltd., New Delhi, 1996.
Simposon, B.B. and Conner-Ororzaly, M. Economic Botany Plants in Our World, McGraw Hill, New York, 1986

## ZOOLOGY

***301 Chordate Structure and Function And Developmental Biology*** ***MAX. MARKS: 75***

**Unit I:** Classification and characters of phylum Chordata (excluding extinct forms) up to orders, Comparisons of habit, habitat, external features and anatomy of Balanoglossus, Herdmania and Branchiostoma (excluding development).

Ascidian tadpole larva and its Metamorphosis, Affinities of Hemichordate, Urochordate and Cephalochordates, Habit, Habitat and salient features of Petromyzon, Ammocoete larva.

**Unit II:** Integument including structure and development of placoid scales, feathers and hairs, Jaw suspensorium, limbs and girdles of Rana, Uromastix, Columba and Oryctolagus.

Heart and aortic arches, respiratory system and alimentary canal of Scoliodon, Rana, Uromastix, Columba and Oryctolagus.

**Unit III**: Brain, urinogenital system (Scoliodon, Rana, Uromastix, Columba and Oryctolagus), Identification of poisonous and non poisonous snakes. Biting mechanism in snakes, flight adaptations in birds. Adaptations in aquatic mammals.

*Developmental Biology*

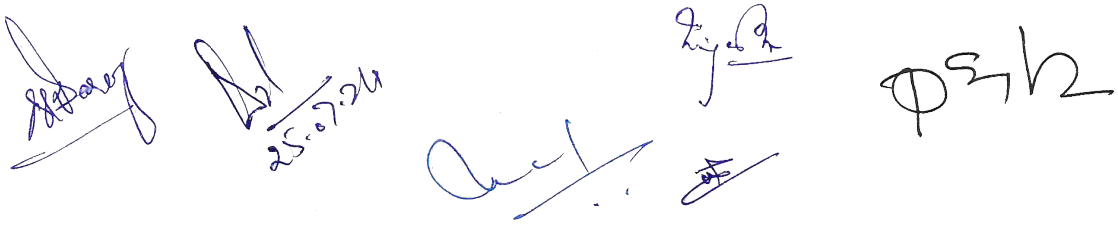
**Unit IV**: Formation of egg and sperm, vitellogenesis and fertilization. Types of eggs and sperms, parthenogenesis, regeneration.Planes and patterns of cleavage in chordates, significance of cleavage and blastulation, Morphogenetic cell movement, Fate maps and significance of gastrulation.

Development of Branchiostoma (Amphioxus) up to gastrulation; chick egg and its development up to the formation of primitive streak, Extra embryonic membranes of chick, development of placenta in rabbit, types and functions of placenta in mammals.

**Unit V :** Various types of stem cells and their applications (with special reference to embryonic stem cells),Cloning of animals: nuclear embryonic transfer technique, nuclear transfer technique; Identical, Siemese and fraternal twins and Artificial insemination. Organogenesis of alimentary canal, eye, kidney, gonads and brain in mammal.

1. Arey, L.B. : Developmental Anatomy, Asia Publishing House, Mumbai
2. Chopra, V.L. : Genetic Engineering and Biotechnology, Oxford & I.B.H., New Delhi
3. Das, S.M. : The Indian Zoological Memoirs, Herdmania, Lucknow Publishing House, Lucknow
4. Jorden, E.L. and Verma, P.S.: Chordate Zoology and Animal Physiology, S. Chand & Co., N. Delhi
5. Kotpal, R.L. : Chordate Zoology, Rastogi Publication, Meerut
6. Dalela, R.C. : A Text Book of Chordate Zoology, Jai Prakash Nath Publication, Meerut

7. Bhatia, A., Jain, N. and Kohli, N.S.: An outline of Biotechnology, Ramesh Book Depot, Jaipur
8. Balinsky : Introduction to Embryology (CBS College Publishers)
9. Kuby : Immunology (W.H. Freeman)
10. R.A. Meyers (Ed.) : Molecular Biology and Biotechnology (VCH Publishers)
11. Jain, P.C. : Text Book of Embryology, Vishal Publication, Jalandhar
12. Srivastava, M.D.L. : An Introduction to Comparative Anatomy of Vertebrates, Pothishala Ltd., Allahabad
13. Thillayampalam, E.M. : Scoliodon, Lucknow Publishing House, Lucknow
14. Weichart, G.K. : Anatomy of the Chrodates, McGraw Hill, New York
15. Lewis, C.D. and Lewin, R., Biology of Gene, McGraw Hill, Toppan Co. Ltd.
16. Winchester, Genetics, Oxford IBH Publications
17. Agarwal, R.A., Srivastava, Anil Kumar and Kaushal Kumar: Animal Physiology and Biochemistry, S. Chand & Co. Ltd., New Delhi.



## SEMESTER IV

## CHEMISTRY

401 ***ORGANIC CHEMISTRY*** ***MAX. MARKS: 75***

**Unit I: Electromagnetic Spectrum**: Absorption Spectra, Ultraviolet (UV) absorption spectroscopy – absorption laws (Beer-Lambert law), molar absorptivity,presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and enones.UV applications including identification of groups.

**Unit II: Alcohols :** Classification and nomenclature.Monohydric alcohols – nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters.Hydrogen bonding.Acidic nature.Reactions of alcohols. Dihydric alcohols– nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage[Pb(OAc)4 and HIO4] and pinacol-pinacolone rearrangement.Trihydric alcohols – nomenclature and methods of formation, chemical reactions of glycerol. Phenols:Nomenclature, structure and bonding.Preparation of phenols, physical properties and acidic character.Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide Zion.Reactions of phenols – electrophilic aromatic substitution, acylation and carboxylation.Mechanisms of Fries rearrangement, Claisen rearrangement, Gatterman synthesis,Hauben-Hoesch reaction, Lederer-Manasse reaction and Reimer- Tiemann reaction.

**Unit III: Aldehydes and Ketones** Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties.Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations.Condensation with ammonia and its derivatives.Wittig reaction.Mannich reaction.Use of acetals as protecting group.Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction.MPV, Clemmensen, WolffKishner, LiAIH4 and NaBH4.

**Unit IV: Carboxylic Acid** Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength.Preparation of carboxylic acids.Reactions of carboxylic acids.HellVolhard-Zelinsky reaction.Reduction of carboxylic acids.Mechanism of decarboxylation, esterification and hydrolysis of esters (acidic and basic). Reactive methylene compounds: malonic ester and acetoacetic ester – preparation and synthetic applications. Mechanism of Claisen condensation Ethers and Expoxides

Nomenclature of ethers and methods of their formation, physical properties. Chemical reactions – cleavage and autoxidation, Ziesel's method for methoxy group.

Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide, reactions of Grignard and organolithium reagents with epoxides.

**Unit V: Organic Compounds of Nitrogen**:Preparation of nitroalkanes and nitroarenes.Chemical reactions of nitroalkanes.Mechanisms of nucleophilic substitution in nitroarenes and their reductions in acidic,

neutral and alkaline media,Picric acid.

Alkyl and Aryl amines: Reactivity, structure and nomenclature of amines, physicalproperties.

Stereochemistry of amines.Separation of a mixture of primary, secondary andtertiary amines.

Structural features effecting basic nature of amines. Amine salts as phasetransfercatalysts. Preparation of alkyl and aryl amines (reduction of nitro compounds.nitriles), reductive amination of aldehydic and ketonic compounds.Gabriel-phthalimidereaction, Hofmann bromamide reaction.Reactions of amines, electrophilic aromaticsubstitution in aryl amines, reactions of amines with nitrous acid. Synthetic transformationsof aryl diazonium salts, azo coupling.

***Books Recommended:***

1. Advanced Organic Chemistry by Mukherji, Singh &Kapoor
2. Organic Chemistry by Bahal and Bahal
3. Advanced Organic Chemistry by Morrison & Boyd
4. Carbonic RasayanBy K.M. Gangotri, RBD.

***Laboratory Course/PRACTICAL*** ***MAX. MARKS: 50***

**Inorganic Chemistry: [10]**

Gravimetric analysis

(i) To estimate Barium as barium sulphate.

(ii) To estimate copper as cupric oxide/ copper (I) thiocynate.

(iii) To estimate Zinc as Zinc oxide.

**Organic Chemistry: [10]**

(i) Calibration of Thermometer: - The following compounds may be used for the calibration purpose 800-820 (Naphthalene), 113.50-1140 (Acetanilide), 132.50-1330 (Urea) and 1220 (Benzoic acid).

(ii) Qualitative Analysis: - Identification of organic compounds (one liquid and one solid) through the functional group analysis (containing only one functional group).

**Physical Chemistry: [10]**

Viscosity and Surface Tension:

(I) To determine the surface tension of a given organic liquid by Stalagmometer .

(II) To determine the viscosity of the given organic liquid by Ostwald Viscometer

(III) To determine the composition of a binary solution by surface tension measurement.

(IV) To determine the composition of a binary solution by Viscosity measurement.

**Viva-Voce [10]**

**Internal (Sessional/Record) [10]**

***Books Suggested (Laboratory Courses):***

1. Practical Chemistry S.Giri, D.N.Bajpai and O.P.Pandey Publ. S. Chand
2. Practical Chemistry, K.M. Gangotri, R.B.D. Jaipur.

## PHYSICS

***401 QUANTUM MECHANICS AND SPECTROSCOPY*** ***MAX. MARKS: 75***

**Unit I:** Development of quantum theory: Blackbody radiation and their characteristics, failure of classical physics to explain spectral distribution of blackbody radiation, Planck's quantum Hypothesis, Average energy of Planck oscillator, Planck's radiation formula, Wien's law, Rayleigh-Jean's Law,

Stefan-Boltzmann's Law; Failure of classical physics to explain photo-electric effect and Compton effect, photons as carrier of energy and momentum of electro-magnetic waves.

**Unit II:** Wave Mechanics and Schrödinger equation: Phase velocity and group velocity of waves, wave particle duality; De Broglie Hypothesis; De Broglie group and phase velocity, wave packet, Heisenberg uncertainty principle, Statement and its equation from wavepacket in space and time; Application of uncertainty principle such as (i) Non-existence of electron in nucleus, (ii) Ground state of H-atom, (iii) Natural line width of spectral lines, X-ray microscope, Particles passing through (a) single slit and (b) double slit and observed on screen behind, explanation of distribution in terms of probability amplitude and interference of probability amplitude.Postulates of Quantum Mechanics: Wave functions, Schrödinger superposition principle, operators in Quantum mechanics, Hermitian operators, expectation values, Interpretation of wave-function, symmetric and anti-symmetric wave functions, concept of parity; Probability density, Schrödinger equation, Schrödinger equation for free particle; Arguments in favour of this equation.

**Unit III:** Application of Schrödinger equation: Schrödinger equation for particle moving in potential field, Time dependent and time independent Schrödinger equation, Stationary states, Orthogonality of wave functions, Probability current density, Ehrenfest Theorem, Simple solution of Schrodinger equation (Restricted to one dimensional case), Particle in one dimensional infinite well, Particle in one dimensional finite well (one or both sides of well may be non-rigid), Calculation of reflection and transmission coefficient for potential step and potential barrier.

**Unit IV:** Atomic Spectroscopy: Orbital angular momentum, electron spin and Stern Gerlac experiment, Total angular momentum, Spin-orbit interaction, Vector model of atom and quantum numbers associated with atom, L-S coupling and j-j coupling, Statement of Hund's Rule and Lande Interval Rule (without derivation), Fine structure of spectral lines, spectral terms up to two valence electron system, Pauli's exclusion principle.

**Unit V:** Atom in magnetic field: Magnetic moment of atom, contribution from orbital and spin angular momentum, gyro-magnetic ratio; Interaction energy of atom in magnetic field, splitting of energy levels, using good quantum numbers in Normal Zeeman effect, Anomalous Zeeman effect and Paschen-Back effect, Selection rules for dipole transitions.

Molecular spectroscopy: qualitative features of molecular spectra, rigid rotator, rotational and vibrational energy levels of diatomic molecules, rotational-vibrational spectra.

***Books suggested:***

1. Semat: Atomic Physics
2.Alonso and Finn: Fundamental University Physics, Vol. – III.
3. Beiser: Concepts in Modern Physcis
4. Waghmare: Quantum Mechanics
5. Wehr, Richards, Adair: Physics of the Atom, Narosa.

**EXPERIMENTS FOR PRACTICAL WORK** ***MAX. MARKS: 50***

*Note: Any 15 experiments to be performed by all the students out of following list.*

1. Low resistance by Carey Foster Bridge.
2. Variation of magnetic field along the axis of circular Coil.
3. Study of an RL Circuit for Phase relations.
4. Study of rise and decay in CR Circuit.

5. Study of electro-magnetic function and verification of Faraday's Laws.
6. Determination of temperature coefficient of platinum resistance thermometer using Carey Foster Bridge.
7. Determine thermal conductivity of a bad conductor by Lee's method.
8. Determination of Ballistic Constant of a Ballistic galvanometer using condenser.
9. Determination of Ballistic Constant of a Ballistic galvanometer by steady deflection method.
10. Determination of high resistance by method of leakage.
11. Study of Gaussian distribution using statistical board.
12. Determination of mutual inductance of a coil.
13. Experimental verification of the first law of thermodynamics by discharging the condenser.
14. Study of variation of total thermal radiation with temperature.
15. Plot thermo emf versus temperature and find the neutral temperature and temperature of inversion.
16. Determination of Self Inductance of a Coil using Ballistic galvanometer.
17. To study the electromagnetic damping of a compound pendulum.
18. To study the excitation of normal modes and measure frequency splitting using two coupled oscillator.
19. Study of dependence of velocity of wave propagation on line parameters using torsional wave apparatus.
20. Study of variation of reflection coefficient on nature of termination using torsional wave apparatus.

## MATHEMATICS

***401 Numerical Analysis and Linear Programming*** ***MAX. MARKS: 100***

**Unit 1:** Difference operators and factorial notation, Differences of polynomial, Newton's formulae for forward and backward interpolations. Divided differences, relation between divided differences and Simple difference. Newton's general interpolation formulae, Lagrange interpolation formula.

**Unit 2:** Central differences, Gauss, Stirling and Bessel interpolation formulae. Numerical Differentiation.Numerical integration, Trapezoidal, Simpson's and Weddle's rules.

**Unit 3:** Solution of linear difference equations with constant and variable coefficients. Solution of Algebraic and Transcendental equations, Iterative, Regula Falsi and Newton Raphson methods.

**Unit 4:** Convex sets and their properties, introduction to linear programming problems. Mathematical formulation; Graphical method of solution of linear programming problems for two variables.

**Unit 5:** The simplex technique and its application to simple L.P. problems. Concepts of daulity in linear programming. Framing of dual programming. Elementary theorems of daulity.

***SUGGESTED BOOKS***

Gokhroo, Saini : Linear Programming (Hindi Ed. ), Navkar Prakashan, Ajmer.
Mittal, Sethi : Linear Programming, Pragati Prakashan, Meerut
Goyal, Mittal : Numerical Analysis, Prograti Prakashan, Meerut

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Bansal, Bhargava : Numerical Analysis (Hindi Ed.); Jaipur Publishing House, Jaipur
Saxena, H.C. : Numerical Analysis; S.Chand & Co., New Delhi
Gokhroo : Numerical Analysis (Hindi Ed.);Navkar Prakashan, Ajmer
Bhargava, Sharma, Bhati : Linear programming (Hindi Ed.); Jaipur Publishing House, Jaipur

## BOTANY

**401 *TAXONOMY, ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS*** ***MAX. MARKS: 75***

**Unit I:** Diversity in plant form in annuals, biennials and perennials, Canopy architecture in angiosperms: tree-origin, development, arrangement and diversity in size and shape, Flowermodified shoot, structure and development of flower, Inflorescence-types of Inflorescence.

**Angiosperms**: Origin and evolution. Some examples of primitive angiosperms. Angiosperm taxonomy; (Alpha-taxonomy, Omega-taxonomy, holotaxonomy) Taxonomic literature. Botanical nomenclature; principles and rules; taxonomic ranks, type concept, principle of priority.Classification of angiosperms; salient features of the systems proposed by Bentham and Hooker and Engler and Prantl.

**Unit II:** Major contributions of cytology and molecular biology, phytochemistry and taximetrics to taxonomy. Diversity of flowering plants as illustrated by members of the families Ranunculaceae,Papaveraceae, Caryophyllaceae, Capparidaceae, Cucurbitaceae, Rutaceae and Apiaceae.

Diversity of flowering plants as illustrated by members of the families Asteraceae, Acanthaceae, Apocynaceae, Asclepiadaceae, Scrophulariaceae, Lamiaceae, Euphorbiaceae,Musaceae and Poaceae.

**Unit III: Anatomy of Angiosperms:** Concept of stem cell in plants. Root system; Root apical meristem; differentiation of primary and secondary tissues and their roles; structural modification for storage, respiration, reproduction and for interaction with microbes.

Shoot system: The shoot apical meristem and its histological organization; vascularization of primary shoot in monocotyledons and dicotyledons; cambium and its functions; formation of secondary xylem, a general account of wood structure in relation toconduction of water and minerals; characteristics of growth rings, sapwood and heart wood; secondary phloem-structure,function relationship; Periderm.

**Unit IV:** Abnormal secondary growth and Leaf: Abnormal secondary growth in stems due to abnormal origin and activity of cambium. Leaf: Internal structure in relation to photosynthesis and water loss; adaptations to water stress; senescence and abscission.

**Unit V: Embryology:** Structure of anther and pistil. Development of the male and female gametophytes; pollen-pistil interactions, self incompatibility; Double fertilization; Development of endosperm and embryo; Brief account of experimental embryology. Basics of gene imprinting.

***Suggested Laboratory Exercises*/PRACTICAL** ***MAX. MARKS: 50***

Field study of diversities found in leaf shapes, size, thickness and surface properties.

The following families are for detailed taxonomic studies:

1. Ranunculaceae: Ranunculus, Delphinium
2. Papareraceae: Papaver, Argemone
3. Caryophyllaceae: Dianthus, Gypsophylla, Saponaria
4. Capparidaceae: Capparis, Cleome
5. Rutaceae: Murraya, Citrus

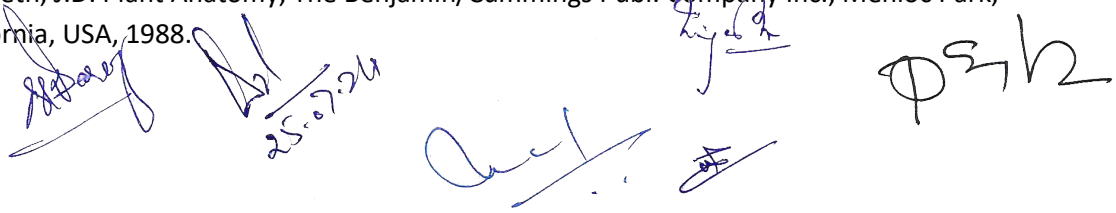
6. Apiaceae: Coriandrum, Foeniculum, Anethum
7. Cucurbitaceae: Luffa or any Cucurbit
8. Asteraceae: Helianthus, Calandula, Sonchus
9. Acanthaceae: Adhatoda, Barleria
10. Apocynaceae: Catharanthus, Thevetia, Nerium
11. Asclepiadaceae: Calotropis
12. Scrophulariaceae: Linaria, Antirrhinum
13. Euphorbiaceae: Euphorbia, Phyllanthus
14. Lamiaceae: Ocimum, Salvia
15. Musaceae: Musa
16. Poaceae: Avena, Triticum, Hordeum, Poa, Sorghum

**Suggested Laboratory Exercises**

**Anatomy:** L.S. of shoot tip of study cytohistological zonation and origin in leaf primordial. Anatomy of primary and secondary growths in monocots and dicots using hand sections (or prepared slides). Structure of secondary phloem and xylem. Growth rings in wood. Microscopic study of wood in T.S., T.L.S. and R.L.S. Internal structure of leaf. Structure and development of stomata (using epidermal peels of leaf). Anatomy of root, primary and secondary structures, Abnormal secondary growth in stem.

***Suggested Readings***

Bhandari, M.M. Flora of Indian Desert 1990.
Bhojwani, S.S. and Bhatnagar, S.P. The Embryology of Angiosperms, 4th Revised and enlarged edition, Vikas Publ., New Delhi, 2016.
Davis, P.H. and Heywood, V.H. Principles of Angiosperm Taxonomy, Oliver and Boyd, London, 1963.
Fegerig K. and Vender PifiThe Principles of Pollination Ecology, Pergamon Press, 1979.
Gifford, E.M. and Foster, A.S. Morphology and Evolution of Vascular Plants, W.H. Freemad and Company, New York, 1979.
Heywood, V.H. and Moore, D.M. (eds.) Morphology and Evolution of Vascular Plants, W.H. Freeman and Company, New York, 1984.
Jeffrey, C. An Introduction to Plant Taxonomy, Cambridge University Press, Cambridge, London,1982.
Jones, S.D. Jr. and Suchsinger, A.E. Plant Systematic (2nd ed.) McGraw-Hill Book Co., New York,1986.
Maheshwari, J.K. Flora of Delhi, CSIR, New Delhi, 1963.
Redford, A.E.: Fundamentals of Plant Systematics, Harper and Row, New York, 1986.
Sharma, O.P. Taxonomy: Tata McGraw Hill Pub. Company Ltd., New Delhi 2000.
Singh, G. Plant Systematics – Theory and Practices, Oxford and IBH Pvt. Ltd., New Delhi,1999.
Singh, V., Pandey, P.C. and Jain, D.K. Angiosperms, Rastogi Pub., Meerut, 2016
Cutter, E.G. Plant Anatomy: Experiment and Interpretation, Part II. Organs, Edward Arnold, London, 1971.
Esau, K. Anatomy of Seed Plants, 2nd John Wiley & Sons, New York, 1977.
Fahn, A. Plant Anatomy. 2nd ed. Pergamon Press, Oxford, 1974.
Mauseth, J.D. Plant Anatomy, The Benjamin/Cummings Publ. Company Inc., Menloc Park, California, USA, 1988.



# ZOOLOGY

***401 Immunology Microbiology and Biotechnology*** ***MAX. MARKS: 75***

**Unit I:** Types of immunity (innate and acquired, humoral and cell mediated), Antigen: Antigenicity of molecules, haptens, Antibody: Structure and functions of each class of immunoglobulins (IgG, IgM, IgD, IgA and IgE), antigen – antibody reactions.

**Unit II:** Theory of spontaneous generation; Germ theory of fermentation and diseases: Works of Louis Pasteur, John Tyndal, Rober-Koch and Jenner, Bacteria: Cell membrane, patterns of arrangement; structure of capsule and cell envelops; organization of cytoplasmic membrane of Gram - negative and Gram - positive strains, Genetic material of bacteria: (i) Chromosome (ii) Plasmids.

**Unit III:** Asexual and sexual reproduction in Bacteria ,Culture of Bacteria: Carbon and energy source, Nitrogen and minerals and Organic growth factors, Effect of environmental factors on bacterial culture: Temperature, hydrogen ion concentration; Medical importance of Gram-negative and Gram-positive bacteria.

**Unit IV**: Recombinant DNA technology: Introduction and principles, restriction endonucleases, cloning vehicles (plasmids, bacteriophages); methods of gene
transfer and applications.

**Unit V:** Environmental Biotechnology (outline idea only): Metal and petroleum recovery, pest control, waste-water treatment, Food, Drink and Dairy Biotechnology (outline idea only): Fermented food production: dairy products, alcoholic beverages and vinegar: microbial spoilage and food preservation.

## *Practical* ***MAX. MARKS: 50***

1. Study of microbes in food material (like curd, etc.)
2. Bacteria culture
3. DISSECTION/ demonstration of dissection

Scoliodon : General anatomy, alimentary canal, afferent and efferent blood vessels, urinogenital system, brain and cranial nerves – V, VII, IX and X only and internal ear Labeo / Wallago, Brain V, VII, IX and X Cranial nerves, afferent and efferent blood vessels, air sacs, and internal ear.

Rattus: General anatomy, digestive, blood vascular and urinogenital systems

4. OSTEOLOGY

Articulated and disarticulated skeleton of Rana, Varanus, Gallus and Oryctolagus

5. PERMANENT PREPARATIONS

Scoliodon: Placoid scales, Ampulla of Lorenzini.

6. Identification, systematic position and comments of the following animals:

Hemichordata: Balanoglossus

Urochordata: Salpa, Doliolum and Herdmania

Cephalochordata: Petromyzon and Myxine

Pisces: Zygaena, Scoliodon, Pristis, Torpedo, Trygon, Protopterus, Labeo, Heteropneustis (Saccobranchus), Belone, Exocoetus, Anabas and Echeneis

Amphibia: Necturus, Amphiuma, Amblystoma, Axolotal larva, Hyla, Uraeotyphlus

Reptilia: Trionyx, Chelone, Varanus, Uromastix, Ophiosaurus, Naja, Bungarus, Echis, Hydrophis, Eryx, Ptyas, Crocodilus and Gavialis

Aves: Columba, Pavo, Choriotis, Francolinus, Streptopelia

Mammalia: Meriones, Funambulus, Rattus, Hemiechinus, Suncus, Ptecopus, Presbytis and Macaca

7. Microscopic Study

Hemichordata: Section through proboscis and branchiogenital region Branch stoma: T.S. oral hood, pharynx, gonads, intestine and caudal region Scoliodon: T.S. gill and scroll valve

Rana: T.S. through various organs, T.S. and L.S. of developmental stages Reptilia: V.S. skin of lizard

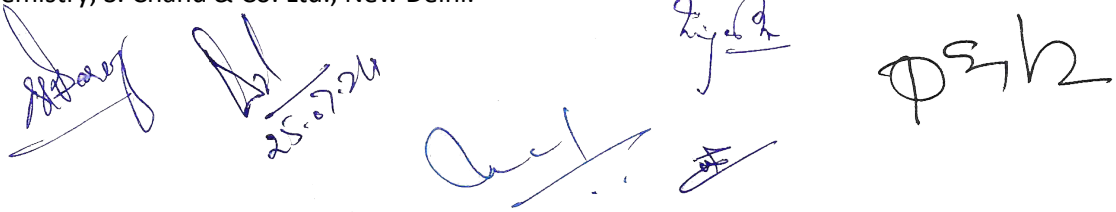
Aves: V.S. skin, different types of feathers

Chick embryology: Whole mounts of embryos of 18, 24, 33, 48 and 72 hours Mammalia: T.S. through various organs

*Note: Each regular student is required to keep a record of practical work done by him/her duly checked by the teacher which will be submitted at the time of practical examination.*

***List of Recommended Books***


1. Arey, L.B. : Developmental Anatomy, Asia Publishing House, Mumbai
2. Chopra, V.L. : Genetic Engineering and Biotechnology, Oxford & I.B.H., New Delhi
3. Das, S.M. : The Indian Zoological Memoirs, Herdmania, Lucknow Publishing House, Lucknow
4. Jorden, E.L. and Verma, P.S.: Chordate Zoology and Animal Physiology, S. Chand & Co., N. Delhi
5. Kotpal, R.L. : Chordate Zoology, Rastogi Publication, Meerut
6. Dalela, R.C. : A Text Book of Chordate Zoology, Jai Prakash Nath Publication, Meerut
7. Bhatia, A., Jain, N. and Kohli, N.S.: An outline of Biotechnology, Ramesh Book Depot, Jaipur
8. Balinsky : Introduction to Embryology (CBS College Publishers)
9. Kuby : Immunology (W.H. Freeman)
10. R.A. Meyers (Ed.) : Molecular Biology and Biotechnology (VCH Publishers)
11. Jain, P.C. : Text Book of Embryology, Vishal Publication, Jalandhar
12. Srivastava, M.D.L. : An Introduction to Comparative Anatomy of Vertebrates, Pothishala Ltd., Allahabad
13. Thillayampalam, E.M. : Scoliodon, Lucknow Publishing House, Lucknow
14. Weichart, G.K. : Anatomy of the Chrodates, McGraw Hill, New York
15. Lewis, C.D. and Lewin, R., Biology of Gene, McGraw Hill, Toppan Co. Ltd.
16. Winchester, Genetics, Oxford IBH Publications
17. Agarwal, R.A., Srivastava, Anil Kumar and Kaushal Kumar: Animal Physiology and Biochemistry, S. Chand & Co. Ltd., New Delhi.

## SEMESTER V

## CHEMISTRY

**501** ***Inorganic Chemistry*** ***MAX. MARKS: 75***

**UNIT I:** Metal-Ligand bonding in transition metal complexes: Valence bond theory of complexes and its limitation, Crystal field theory, Crystal field splitting of energy levels in octahedral, tetrahedral and square planer complexes, crystal-field stabilization energy of octahedral complexes (Calculation Only).

**UNIT II**: Hard and soft Acid Base Concept (HSAB): Classification of acid and base as hard and soft. Pearson's HSAB concept and its application. Magnetic properties of transition metal complexes: Types of magnetic behaviour,magnetic properties of metal complexes, spin only formula, methods of determining magnetic moment and magnetic susceptibility.

**UNIT III:** Stability of metal complexes: A brief outline of thermodynamic stability of metal complexes and factors affecting the stability. Kinetic stability, labile and inert complexes, colour of transition metal complexes, effective atomic number (EAN), pi accepter ligands, experimental determination of stability constant and composition of complex ( Job's Method and Bjerrum's Method).

**UNIT IV:** Organometallic Chemistry: Defination, nomenclature and classification of organometallic compounds, bonding, preparation, properties and application of organometallic compounds of Li, Al, Hg and Sn (alkyls and aryl).

Bioinorganic Chemistry: Essential and trace elements in biological processes,Biological role of alkali (Na, K, Li) and alkaline earth (Mg, Ca) metals.

**UNIT V**: Basic principles of Metallurgy and metallurgical processes. Metallurgy of Copper, Zinc, Platinum and Uranium from their main ores.

***Books Recommended:***

1. Inorganic Chemistry Part I and part II by N.C.Sogani, M.L.Sharma,G.K.Rastogi
2. Inorganic Chemistry by G.C.Shivhare, V.P.Lawania
3. Text Book of Inorganic Chemistry by P.L.Soni
4. Text Book of Inorganic Chemistry by Satya Prakash, Tuli& Madan

## PHYSICS

**501** ***ELECTRONICS*** ***MAX. MARKS: 75***

**Unit I:** Intrinsic and extrinsic semi-conductors, Fermi levels, mass-action law; carrier injection,recombination, diffusion and diffusion length, drift and diffusion currents, continuity equation; p-n junction, potential barrier, biasing, current-voltage relation, space charge and diffusion capacitances; varactor diode; Zener diode; tunnel diode; photovoltaic effect, solar cell.Power supplies: Full wave and half wave rectifiers; ripple factor, voltage regulation; filters; Zener regulation.

**Unit II:** Network theorems – Thevenin, Norton, Maximum power transfer and Miller theorems. Dipolar junction transistors, Ebers-Moll equations; CB, CE and CC configurations, BJT characteristics; biasing and thermal stabilization, self bias; hybrid parameters of a two port network; small signal hybrid equivalent model of a BJT at low frequencies, current, voltage and power gains; input and output impedances; high frequency hybrid pi model, short circuit current gain, fβ and fα; current gain with resistive load.

**Unit III:** Field effect transistors, JFET, MOSEET, construction and characteristics; FETs as voltage

Controlled Devices, small signal model. Large signal amplifiers, class A, B and C operations and efficiencies; distortions; determination of second harmonic distortion; push-pull amplifiers; impedance matching.

**Unit IV**: Negative Feedback: Current and voltage negative feedbacks; effect on stability, input and output impedances, distortion, frequency response; emitter follower. Oscillators: Positive feedback, Barkhausen criterion; RC phase-shift oscillator; Hartley and Colpitts oscillators, UJT and sweep generators using UJT; Transistor as a switch and Astable multi-vibrator.

**Unit V:** Operational amplifiers, inverting and non-inverting; differential amplifiers, CMRR; measurement of OP AMP parameters; use of OP AMPs as adder, in analog integration and
differentiation. Digital circuits, Boolean algebra; AND, OR, NOT, NOR, NAND, XOR gates; logic gate circuits; realization of logic functions.

***Books suggested:***

1. J. Millman and CC Halkias: Integrated Electronics : Analog and Digital Circuits and Systems,
Tata McGraw Hill.
2. A. Mottertshead: Electronic Devices and Circuits – An Introduction, Prentice Hall India.

## MATHEMATICS

***501 Analysis and Laplace Transforms*** ***MAX. MARKS: 100***

**Unit I** : Dedekinds theory of real numbers. Linear sets. Upper and Lower bounds, Limiting points, Weierstrass's theorem. Derived sets, Enumerable Sets, Open and Closed sets.

**Unit II** : Theory of Riemann integration, Darboux theorem. Fundamental theorem of integral calculus, Mean value theorem of integral calculus.

**Unit III:** Functions, Limits, and continuity. Differentiability, Concept of an analytic function, Cartesian and Polar form of Cauchy-Riemann equations. Harmonic function, Conjugate function, Laplace's differential equations, Orthogonal system, Construction of analytic functions. Power Series: Absolute convergence of power series, circle and radius of convergence of power series, sum function of a power series.

**Unit IV**: Basic definition and Properties of complex integration Complex integration as the sum of two line integrals, Inequality for complex integrals. Curves in complex plane, Cauchy-Goursat theorem, Connected regions, Indefinite integral (or Anti Derivative). Derivative of Single-valued functions F(z). Cauchy's integral formula, Extension of Cauchy's integral formula to multiconnected, regions, Cauchy's integral formula for the derivative of an analytic function, Successive derivative of an analytic function, Morera's Theorem. Liouville's Theorem, Poisson's integral formula.

**Unit V:** Laplace Transforms and Inverse Laplace Transforms. Laplace transforms of derivatives and integrals. Shifting theorems. Convolution theorem. Applications of Laplace Transform to the solution of differential equations.

**SUGGESTED BOOKS**

Shanti Narayan: Real Analysis; S.Chand & Co., New Delhi.
G.N.Purohit: Real Analysis; Jaipur Publishing House, Jaipur.
Bhargava, Goyal: Real Analysis (Hindi Ed.); Jaipur Publishing House, Jaipur.
Gokhroo, Saini, Ozgha: Real Analysis (Hindi Ed.); Jaipur Publishing House, Jaipur.
Shanti Narayan: Theory of Functions of a Complex Variable; S.Chand & Co., New Delhi.
Gupta, K.P. : Complex Analysis; Pragati Prakashan; Meerut

Gokhroo, Saini & Yadav: Complex Analysis (Hindi Ed.); Navkar Publication, Ajmer
G.N. Purohit: Complex Analysis; Jaipur Publishing House, Jaipur.
S. Ponnusamy: Foundations of Complex Analysis, Narosa Publishing House, Bombay, New Delhi.
V. Karunakaran: Complex Analysis, Narosa Publishing House. Bombay, New Delhi (2002).
N.Levinson and R.M. Redheffer: Complex Variables, Tata McGraw-Hill Publ. Co. Ltd., New Delhi (1980).

## BOTANY

***501 CELL BIOLOGY, GENETICS, PLANT BREEDING AND EVOLUTION*** ***MAX. MARKS: 75***

**Unit I:** History of cell biology: Concept of cell and cell theory. Cell cycle and its regulation.Mitosis and meiosis. Structural and molecular organization of cell. Structure and function of cell wall; plasmodesmata, plasma membrane; golgi complex, plastid, mitochondria, endoplasmic reticulum,peroxisomes, vacuoles and nucleus.

**Unit II:** Chromatin organization: Organization and structure of chromosomes. Concept of Nucleosomes, chromatin remodeling, Types of chromosomes and determination of sex in plants.Chromosome alteration: Structural alteration; deletion, duplication, translocation, inversion; numerical variation: aneuploidy and polyploidy. Molecular basis of mutation: Spontaneous and induced, brief account of DNA damage and repair. Introduction to epigenetics.

**Unit III:** Nature of inheritance; Laws of Mendelian inheritance and its exceptions. Crossing over and linkage analysis. DNA the genetic material: Structure and replication, brief account of DNA- protein interaction. Definition of a gene-modern Concept of gene (Promoter, coding sequences, terminator). RNA polymerases and general transcription. Regulation of gene expression in prokaryotes and basics of gene regulation in eukaryotes.

**Unit IV:** Origin of Agriculture, Centers of origin of crop plants and centers of Diversity. Concepts of Centers and Non-center (Harlan Hypothesis) Principles of plant breeding- Domestication, Introduction, Selection, Clonal propagation, Hybridization, Mutation breeding; Breeding work done on wheat; Green revolution; Assessment and Consequences; Biodiversity and Conservation of germplasm.

Unit V: Theories of Evolution: Catastrophism, The Lamark's theory, Darwin's theory, Evidences of organic evolution, mechanism of evolution. Origin of basic biomolecules evolution of prokaryotic and eukaryotic cell and Origin of species. Population genetics: Allele and genotype frequency, HardyWeinberg principles.

**Suggested Laboratory Exercises**

**Cytology**

1. Study of cell structure from onion leaf peels
2. Comparative study of cell structure in onion cells and Hydrilla
3. Smear preparation of root tips for different stages in Allium root tip
4. Cytological examination special types of chromosomes (Slides)
5. Examination of electron micrographs of eukaryotic cells and cell organelles

**Genetics**

1. Working out laws of inheritance using seed mixtures
2. Monohybrid, dihybrid and test crosses using seed samples

**Plant Breeding**

1. Demonstration of Emasculation techniques.

**Suggested Readings**

Alberts, B. et.al. The Cell (Garland).

Lodish, H., et.al. Molecular Cell Biology (Freeman).

Gupta, P. K., Genetics, Rastogi Publications, Meerut.

Rastogi, Veer Bala, Cell Biology, Kedar Nath Ram Nath, Delhi.

De Robertis, E. D. P. and De Robertis, E. M. F.: Cell and Molecular Biology, Halt Saunder, Tokyo, Japan

Alberts, B., Bray, D ., Lewis, J., Raff, M., Roberts, K. and Watson, I.D. Molecular Biology of cell. Garland Publishing Co., New York, USA

Chaudhary, H.K. Elementary Principles of Plant Breeding, Oxford & IBH Publishing New Delhi.

Gupta, P.K. A Textbook of cell and Molecular Biology, Rastogi Publications, Meerut, 2016.

Gupta, P.K. Cytology, Genetics, Evolution and plant Breeding, Rastogi, Publication Meerut, 2016.

Lodish, H., Berk, A., Zipursky, S.L., Matsudaira, P., Baltimore, D. and Darnell, J. Molecular Cell Biology, W.H. Freeman & Co. New York, USA

Miglani, G.S. Advanced Genetics ,Narosa publishing Co., Inc., USA

Russel, P.J. Genetics. The Benjamin/ Cummings Publishing Co., Inc., USA

Shukla, R.S. and Chandel, P.S. Cytogenetics, Evolution and Plant Breeding, S. Chand & Co. Ltd., New Delhi

Singh B.D. Textbook of plant Breeding.Kalyani Publishers, Ludhiana,1999

Sinha, U. and Sinha, S. Cytogenetics, Plant Breeding and Evolution, Vikas Publishing House, New Delhi, 1997

Sunstand, D.P. and Simmons, M.J. Principles of Genetics, John Wiley & Sons Inc., USA 2000

## ZOOLOGY

***501 Cell Biology and Genetics*** ***MAX. MARKS: 75***

**Unit I:** Characteristics of prokaryotic and eukaryotic cells, Characteristics of cell membrane molecules, fluid-mosaic models of Singer and Nicolson, passive and active transport, Structures and functions of endoplasmic reticulum, ribosome,Golgi complex, lysosome, mitochondria, centriole, microtubules and nucleus.

**Unit II:** Structure of Chromatin and Chromosomes, semiconservative mechanism of replication, elementary idea about topoisomerases, replication forks, leading and lagging strands, RNA primers and Okazaki fragments, RNA structure and types, mechanism of transcription, Genetic Code and protein synthesis.

**Unit III:** Interphase nucleus and cell-cycle including regulation.

Mitosis: Phases and process of mitosis, structure and function of spindle apparatus, Theories of cytokinese.

Meiosis: Phases and process of meiosis, synaptonemal complex, formation and fate of chiasmata recombination and significance of crossing over.

**Unit IV:** Mendelism: Brief history of genetics and Mendel's work: Mendelian laws, their significance and current status, linked gene inheritance.

Chromosomal aberration: Structural - translocation, inversion, deletion and

duplication; Numerical - haploidy, diploidy, polyploidy, aneuploidy, euploidy,polysomy and genetic implications.

**Unit V:** Genetic interaction: supplementary genes, complementary genes, duplicate genes, multiple gene interaction, ABO blood groups and their genotypes,Multiple alleles.

**List of Recommended Books:**


1. Alberts, B. et.al. The Cell (Garland).
2. Lodish, H., et.al. Molecular Cell Biology (Freeman).
3. Gupta, P. K., Genetics, Rastogi Publications, Meerut.
4. Rastogi, Veer Bala, Cell Biology, Kedar Nath Ram Nath, Delhi.
5. De Robertis, E. D. P. and De Robertis, E. M. F.: Cell and Molecular Biology, Halt Saunder, Tokyo, Japan.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# SEMESTER VI

## CHEMISTRY

***601 Physical Chemistry*** ***MAX. MARKS: 75***

**UNIT I:Thermodynamics – I**

First Law of Thermodynamics: statement, definition of internal energy and enthalpy.Joule-Thomson Effect, Joule-Thomson coefficient and inversion temperature. Calculation of w, q, dU&dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process. Second Law of Thermodynamics: need for the law, different statements of the law. Carnot cycle and its efficiency,Carnot theorem. Numerical based on above concept.

**UNIT II:Thermodynamics – II**

Concept of entropy: entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, Clausius inequality, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases. Gibbs and Helmholtz function as thermodynamic quantities, Gibbs – Helmholtz equation. Equilibrium constant and free energy. Reaction isotherm and reactionisochore-Clapeyron equation and Clausius-Clapeyron equation, applications. Third law of thermodynamics: Nernst heat theorem, Statement of third law and evaluation of absolute entropy from heat capacity data. Numericals.

**UNIT III: Phase Equilibrium**

Statement and meaning of the terms – phase, component and degree of freedom, Gibbs phase rule, phase equilibria of one component system- water and sulphur systems.

Phase equilibria of two component system- solid-liquid equilibria, simple eutectic –Pb-Ag systems, desiliverisation of lead.Solid solutions – compound formation with congruent melting point (Mg-Zn) and incongruent melting point, (FeCl3-H2O)system. Freezing mixtures.

Nernst distribution law – deviations from Nernst Law, applications to study of complex ion and solvent extraction.

**UNIT IV: Electrochemistry – I**

Conductance, Specific conductance and equivalent conductance. Activity, activity coefficient and ionic strength. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method.

Applications of conductivity measurements: determination of degree of dissociation, determination of Ka of acids, determination of solubility product of a sparingly soluble salt, Conductometric titrations and their types.

**UNIT V: Electrochemistry – II**

Nernst equation, derivation of cell E.M.F. and single electrode potential, standard hydrogen electrode-reference electrodes- standard electrode potential, sign conventions. Electrolytic and Galvanic cells – reversible and irreversible cells, conventional representation of electrochemical cells. EMF of a cell and its measurements. Computation of cell EMF. Calculation of thermodynamic quantities of cell reactions (_G, _H and K). Concentration cell with and without transport (mathematical treatment), liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient. Potentiometric titrations, Determination of pH using hydrogen, quinhydrone and glass

electrodes. Numericals.

***Books Suggested:***

1. The Elements of Physical Chemistry, P.W. Atkins, Oxford.
2. Physical Chemistry Through problems, S.K. Dogra and S. Dogra, Wiley Eastern Ltd.
3. Principles of Physical Chemistry, B.R. Puri, L.R. Sharma and M.S. Pathania, Shobhan Lal Naginchand& Co.
4. BhoticRasayan (Hindi medium) by K.R.Genwa RBD.

***PRACTICALS*** ***MAX. MARKS: 50***

**Inorganic Preparations (Two): [10]**

Micro cosmic salt.,Tetraaminecopper(II) sulphate, Nickel ammonium sulphate, Sodium thiosulphate, Chrome Alum, Ferrous Sulphate, Ferrous Ammonium Sulphate

**Volumetric analysis [10]**

Redox Titrations:

(i) To determine the strength of given unknown solution of oxalic acid against standard potassium permanganate solution.

(ii)To determine the strength of given unknown solution of ferrous ammonium sulphate against potassium dichromate using potassium ferricyanide as an indicator.

**Physical Chemistry [15]**

Chemical Kinetics:

(i) To study the hydrolysis of an ester catalyzed by an acid and determine the rate constant and order of reaction.

(ii) To study saponification of ester and determine the rate constant and order of reaction.

(iii) To study the reaction b/w acetone and iodine with respect to iodine and determine the rate and order of reaction

***Books Suggested (Laboratory Courses):***


1. Practical Chemistry, S.Giri, D.N.Bajpai and O.P.Pandey Publ. S. Chand
2. Experimental Organic Chemistry Vol I & II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.
3. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
4. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
5. Experiments in General Chemistry, C.N.R. Rao and U.C. Agarwal, East-West Press.
6. Experiments in Physical Chemistry, R.C. Das and B. Behra, Tata McGraw Hill.
7. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.
8. Advanced Experimental Chemistry, Vol. I-Physical, J.N. Gurtu and R. Kapoor, S. Chand & Co.


## PHYSICS

***601 SOLID STATE PHYSICS*** ***MAX. MARKS: 75***

**Unit I:** Crystal structure : Different terms of crystal structure, Fundamental types of lattices, Two and three dimensional lattice types; Seven system of crystals, Characteristics of sc,bcc, fcc, hcp; Miller indices, orientation of planes in cubic lattices; Distribution of Atoms in atomic planes of cubic lattices. Distance between successive planes; Von-Laue's equations, of diffraction of Xrays, Bragg's Law,

scattering from lattice of point-atoms. Scattering factor. Geometrical Scattering factor for sc, bcc, fcc. Reciprocal lattice and its properties.

**Unit II**:Crystal binding and lattice vibrations : Inter-atomic forces of solids. Crystal of inert gases, cohesive energy and bulk modulus. Ionic crystals, Madelung energy and bulkmodulus.Covalent crystals. Hydrogen bonded crystals, Atomic radii. Concept ofphonons Vibration of monatomic lattices, lattice with two atoms per primitive cell. Localphonon modes.Density of states in one dimension, three dimensions, lattice heat capacityfor Einstein model, Debye model.

**Unit III:** Free Electron theory of metals : Free electron model, Density of states of electron gas, Fermi-Dirac distribution function, effect of temperature on Fermi-Dirac distribution function, Fermi energy at absolute zero temperature and low temperature.Electron heat capacity.Thermionic emission. Boltzmann transport equation, Sommerfeld theory of electrical conductivity, Thermal conductivity, Wiedmann-Franz Law. Hall effect.

**Unit IV:** Band theory: Formation of bands and origin of energy gap, Bloch theorem, Kronig Penney model, crystal momentum and velocity of an electron.Effective mass of electrons.Electrons and holes.Number of states in a band, insulator, semi-conductor and metal.Construction of Brillouin Zones and Fermi-surfaces. Fermi levels in intrinsic, n- type and p- type semi-conductors, Mass action Law. The static dielectric constants of solids.Local electric field at an atom.

**Unit V**: Magnetism **:** Diamagnetism and Larmor precession, classical theory of diamagnetism, Para-magnetism and its classical theory, free electron theory.Molecular theory of ferromagnetism.Experimental Survey of Superconductivity : Zero resistance, persistent currents, effect of magnetic fields, flux exclusion, Intermediate state, Entropy effect, frequency effects, Gyromagnetic ratio, Isotope effect. Occurrence of superconductivity. Thermoelectric effects, thermal conductivity. High temperature oxide, superconductors and their properties.BCS theory (elementary idea without mathematical derivation), Magnetic levitation.

***Books Suggested:***

1. Kittel: Introduction to Solid State Physics, Wiley Eastern.
2. A.J. Dekker: Solid State Physics, McMillian India.
3. L. Azaroff: Theory of Solids.

***EXPERIMENTS FOR PRACTICAL WORK*** ***MAX. MARKS: 50***

Note: Any 15 experiments to be performed by all the students out of following list.

1. Study of dependence of velocity of wave propagation on line parameters using torsional wave apparatus.
2. e/m by Thomson's method.
3. Measurement of inductance of coil by Anderson's bridge.
4. Measurement of capacitance and dielectric constant of a liquid and gas by De-Sauty Bridge.
5. To determine the energy Band gap in a semiconductor using junction diode.
6. Study of the characteristics of a given transistor (PNP/NPN) in common emitter configuration and find the value of parameter of given transistor.
7. Study of the characteristics of a given transistor (PNP/NPN) in common base configuration and find the value of parameter of given transistor.
8. Study the characteristics of rectifier junction diode and Zener diode.
9. Study of ripple factor for shunt capacitor, series inductor, L-section and π section filters using full

wave rectifier circuit.

10. Study of frequency response of single stage transistor amplifier (variation of gain with frequency).

11. Study the characteristics of field effect transistor (FET).

12. Study the negative feedback effect on voltage gain, and input and output impedances of the amplifier.

13. Study of operational amplifier (OP-AMP).

14. Design and study of RC phase shift oscillator.

15. Design and Voltage study of AND, OR, NOT, NAND and NOR gates circuits using diodes and transistors.

16. Study of RC circuits as integrating and differentiating systems with Square input.

17. Study of Hybrid Solar and wind energy.

18. Transient Analysis of C-R and L-R circuit.

19. Determination of parameter of transformer.

20. Study of Nano TiO2 Solar Cell.

Note: - New experiments may be added on availability of equipments

## MATHEMATICS

***601 Abstract Algebra*** ***MAX. MARKS: 100***

**Unit I**: Definition and example of groups. General properties of groups, Order of an element of a group.Permutations : Even and Odd permutations. Groups of permutations. Cyclic group, Isomorphism,Isomorphism of cyclic groups, Cayley's theorem.

**Unit II**: Subgroups, Cosets, Lagrange's theorem, Product Theorem of subgroups, Conjugate elements, conjugate complexes, Centre of a group, Normaliser of an element and of a complex. Normal subgroups, quotient Groups, Commutator subgroup of a group. Homomorphism, Fundamental theorem of homomorphism.

**Unit III:** Definition and kinds of rings, Integral domain, Division ring, Field, Subring of a ring, Subfield of a field. Characteristic of a ring and field.

**Unit IV**: Ideals of a ring, Quotient rings, Prime fields, Prime ideals, Field of quotients of an integral domain, Definition and examples of a vector space, subspace of a vector space, Linear combination and linear space, Linear dependence and independence of vectors. Direct product of vector spaces and internal direct sums of subspaces.

**Unit V:** Bases and dimension of a finitely generated spaces, Quotient space, Isomorphism, Linear transformation (Homomorphism), Rank and nullity of linear transformation.

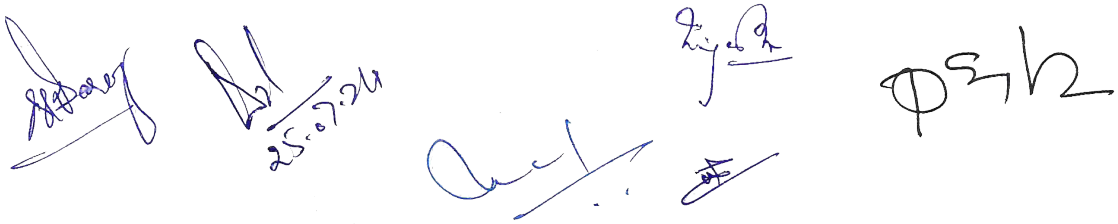
***SUGGESTED BOOKS***

Sharma, G.C. : Modern Algebra; Ram Prasad & Sons, Agra.

Bansal & Bhargava : Abstract Algebra (Hindi Ed. ); Jaipur Publishing House, Jaipur.

Agarwal, R.S. : Text Book on Modern Algebra; S. Chand & Co., New Delhi.

Gokhroo & Saini : Abstract Algebra (Hindi Ed. ); Jaipur Publishing House, Jaipur.



# BOTANY

***601 ECOLOGY AND ENVIRONMENTAL BIOLOGY*** ***MAX. MARKS: 75***

**Unit I:** Plants and Environment: Atmosphere (gaseous composition), water (properties of water cycle), light (global radiation, phytosynthetically 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 vernalization), light (photoperiodism, heliophytes and sciophytes) and salinity.

**Unit II**: Population ecology: Concept and characters, growth curves, biotic potential, ecotypes and ecads. Seed: The significance, suspended animation; ecological adaptation and dispersal strategies Community ecology and Succession: Community characteristics, frequency, density, cover, life forms and biological spectrum. Succession: concept, classification and examples (hydrosere & xerosere).

Unit III: Ecosystems and Productivity: Ecosystem — Structure, abiotic & biotic components, food chain, food web, ecological pyramids, energy flow, biogeochemical cycles of carbon, nitrogen, phosphorus and Sulphur. Productivity: Primary productivity, its measurements and factors affecting primary productivity.

**Unit IV:** Environmental Biology of Indian Desert: Climate, vegetation types, adaptive strategies of desert plants. Desertification: meanings, causes, critical issues & driving forces. Agroforestry and its impact on desert agriculture. Desert biodiversity, Geomorphology, natural resources exploitation and their impact on desert environment.

**Unit V:** Pollution Ecology: Definitions, classification, air, water and land pollution. Concepts of Industrial Ecology in pollution management. Global warming : Concepts and current status. Phytogeography: Vegetation types of India — Forest and Grasslands. Biogeographical regions of India, Remote sensing: The basics and applications in ecological studies

***Suggested Laboratory Exercises/PRACTICAL*** ***MAX. MARKS: 50***

**Cytology**

1. Study of cell structure from onion leaf peels
2. Comparative study of cell structure in onion cells and Hydrilla
3. Smear preparation of root tips for different stages in Allium root tip
4. Cytological examination special types of chromosomes (Slides)
5. Examination of electron micrographs of eukaryotic cells and cell organelles

**Genetics**

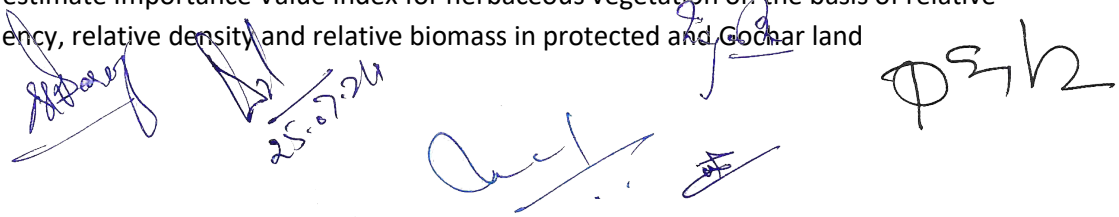
1. Working out laws of inheritance using seed mixtures
2. Monohybrid, dihybrid and test crosses using seed samples

**Plant Breeding**

1. Demonstration of Emasculation techniques.

***ECOLOGY AND ENVIRONMENTALBIOLOGY***

1. To determine minimum number of quadrats required for reliable estimation of biomass in herbaceous vegetation
2. To study the frequency of herbaceous species and to compare the frequency distribution with Raunkaier's Standard frequency diagram
3. To estimate Importance Value Index for herbaceous vegetation on the basis of relative frequency, relative density and relative biomass in protected and Gochar land



4. To measure the vegetation cover of grassland through point frame
5. To measure the above ground plant biomass in a natural field
6. To determine diversity indices (richness Simpson, Shannon-Weaver) in natural fields
7. To estimate bulk density and porosity of soil samples
8. To determine moisture contents, water holding capacity and texture of soil samples
9. To estimate qualitatively nitrate, phosphate and potassium in soil samples
10. To study the vegetation structure through profile diagram
11. To estimate transparency and pH of different water bodies
12. To measure dissolved oxygen content in polluted and unpolluted water samples
13. To estimate salinity, hardness, carbonates and bicarbonate in different water samples
14. To determine the percent leaf area injury of different leaf samples collected around polluted site
15. To estimate dust holding capacity of the leaves of different plant species
16. Plant adaptive modifications: Specimens/Slides:

i) Succulents: Opuntia, Euphorbia
ii) Salt secretion: Atriplex, Chloris
iii) Salt accumulation: Suaeda, Salsola, Zygophyllum
iv) Xerophytes: Calligonum, Capparis, Leptadenia, Parkinsonia
v) Hydrophytes: Eichhornia, Nymphaea, Hydrilla

***Suggested Readings***

Dash, M.C. Fundamental of Ecology, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1996
Kormondy, E.J. Concepts of Ecology, Prentice – Hall of India Pvt., New Delhi, 1996
Kumar, H.D. General Ecology, Vikash Publishing House Pvt. New Delhi, 1995
Mukherjee, B. Environmental Biology, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1997
Odum, E.P. Basic Ecology, Sauders, Philadelphia, 1983
Sen, D.N. Environment and Plant Life in Indian Desert, Geobios International, Jodhpur, 1982
Sharma, P.D. Ecology and Environment, Rastogi Publications, Meerut 2016

## ZOOLOGY

***601 Animal Physiology and Biochemistry*** ***MAX. MARKS: 75***

**Unit I**: Digestion; digestive enzymes, process of digestion, digestion of protein, carbohydrate and lipid Blood: Composition and functions, Blood groups, Rh factor and their significance, blood clotting mechanism, blood pressure and cardiac cycle, respiratory pigments, cardiac muscle activity.

**Unit II**: Muscle: Structure of various types of muscles and mechanism of musclecontraction Excretion: Structure of kidney, types of nephron, mechanism of urine formationand its elimination and arginine, ornithin cycle.

**Unit III:** Respiration: Structure of lung, mechanism of respiration, respiratory pigment,exchange and transport of oxygen and carbon dioxide. Nervous System: Structure of neuron and its classification, Nerve impulse, impulse conduction and reflex action.

**Unit IV**: Endocrine glands: Structure and functions of various endocrine glands, diseases caused by hormonal deficiency; Mechanism of hormone action.

**Unit V**: Structure of Protein and Carbohydrates; oxidation of glucose through glycolysis, Krebs cycle and

oxidative phosphorylation, deamination, transamination and decarboxylation.

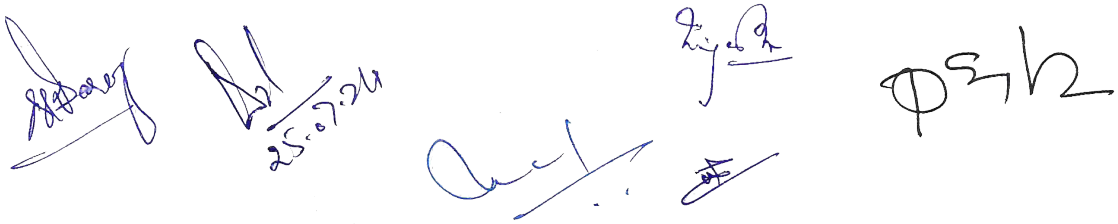
***Practical***

***MAX. MARKS: 75***

1. Test for protein, lipid and carbohydrate.
2. Temporary acetocarmine squash preparation of chromosomes
3. Haemoglobin estimation of mammalian blood
4. Preparation of heamin crystals
5. Osmotic effect of R.B.C.
6. Preparation of mammalian blood film and identification of different types of blood cells
7.Determination of blood groups and Rh-factor
8.To determine the rate of oxygen consumption of rat
9. Analysis of urine for sugar, protein and pH
10. Estimation of E.S.R.
11. Demonstration of amylase activity
12. Estimation of packed cell volume [PCV]
13. Demonstration of working of pH meter
14. Demonstration of working of colorimeter
15. Measurement of blood pressure

***List of Recommended Books:***


1. Srivastava, H.S. : Elements of Biochemistry, Rastogi Publications, Meerut
2. Goel, K.A. and Shastry, K.B. : Animal Physiology, Rastogi Publication, Meerut
3. Dalela, R.C. : Animal Physiology, S. Chand & Co. Ltd., New Delhi
4. Agarwal, R.A., Srivastava, Anil Kumar and Kaushal Kumar: Animal Physiology and Biochemistry, S. Chand & Co. Ltd., New Delhi
5. Kulshrestha, V.V. : Experimental Physiology, Vikas Publishing House, New Delhi
6. Samasiviah, I. et.al. : Text Book of Animal Physiology and Ecology, S. Chand & Co. Ltd., New Delhi
7. Verma, P.S., Tyagi, B.S. and Agarwal, V.K.: Animal Physiology, S. Chand & Co. Ltd., New Delhi
8. Hoar, S.: General and Comparative Physiology, Prentice Hall of India Pvt. Ltd.
9. Wood, D.W.: Principles of Animal Physiology
10. Prosser, C.B.: Comparative Animal Physiology, Satish Book Enterprise
11. Eckert, Animal Physiology. (W.H. Freeman)
12. Alberts, B. et.al. The Cell (Garland).
13 Lodish, H., et.al. Molecular Cell Biology (Freeman).
14 Gupta, P. K., Genetics, Rastogi Publications, Meerut.
15 Rastogi, Veer Bala, Cell Biology, Kedar Nath Ram Nath, Delhi.
16 De Robertis, E. D. P. and De Robertis, E. M. F.: Cell and Molecular Biology, Halt Saunder, Tokyo, Japan.

# SEMESTER VII

## 701 Pedagogy of Sciences

***Objectives Student-teachers will be able to:-*** ***MAX. MARKS: 100***

1. Gain insight on the meaning,natureand scope of physical science for determining aims and strategies of teaching-learning.
2. Appreciate that science is a dynamic and expanding body of knowledge;
3. Trace historical background of Physical sciences.
4. Identify and relate everyday experiences with learning physical science;
5. Appreciate various approaches of teaching-learning of physical science;
6. Perform Pedagogical analysis of various topics in Physical Sciences.
7. Analyze the contents of Physical science with respect to Content, process, skills, knowledge organization and other critical issues.
8. Use effectively different activities/demonstrations/laboratory experiences for teachinglearning of physical science;
9. Integrate physical science knowledge with other school subjects.
10. To understand meaning, concept and various types of assessment.

**COURSE CONTENT**

**Unit 1: Nature of Physical Sciences as a Discipline**

1. Concept, Nature and Needs of Physical Sciencesand physics & chemistry teaching.
2. Scope of physics & chemistry teaching.
3. Historical Background Physical Sciences with special reference to India.

Contribution ofC.V. Raman, M.N. Saha, K.S.Krishnan,J.C. Bose,H.JBhabha, S. Chandra Shekhar and A.P.J. Abdul Kalam in the field of physics & chemistry .

4. Science as a domain of enquiry, as a dynamic and expanding body of knowledge; Science as a process of constructing knowledge; Physical Science as interdisciplinary area of learning

**Unit 2: Physical Sciences as a school subject**

1. Importance of Physics & Chemistry in school curriculum.
2. Aims &objectives of teaching Physics & Chemistry at school level. Writing objectives in behavioural terms.Bloom's taxonomy (revised).
3. Correlation of Physical Sciences with other School Subjects

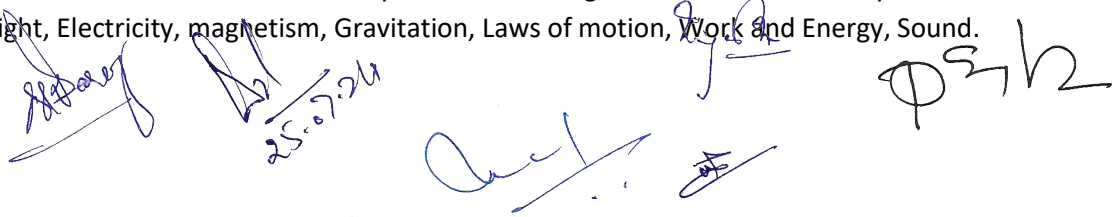
**Unit 3: Methodology of Teaching and learning of Physical Sciences**

1. Scientific attitude and scientific temper: essential skills, methods and process that lead to exploration: Generalization and validation of scientific knowledge in Physical science.

2.Lecture –cum -Demonstration, Team teaching, project method, problem solving method, Group discussion, Programmed instruction, Inductive- Deductive, Investigatory approach, Concept mapping, Collaborative learning, and Experiential learning in physics & chemistry: Facilitating learners for self-study.

**Unit 4: Pedagogical Analysis and mode of learning Engagement**

**1**.Pedagogical analysis of the units with reference to concepts, learning outcomes, activities and learning experiences and evaluation techniques of following content at secondary and Senior secondary levellight, Electricity, magnetism, Gravitation, Laws of motion, Work and Energy, Sound.



**2.** Pedagogical analysis of the units with reference to concepts, learning outcomes, activities and learning experiences and evaluation techniques of following content at secondary and Senior secondary level-Solutions, colloids, chemical equilibrium, electrochemistry, mechanical and thermal properties of matter, chemical bonding and molecular structure, periodic table,Atom and molecules, Chemical Reactions, Acid ,Bases and Salt, Carbon and Its Compounds, metal and non-metalsetc.)

**3**.Modes of learning engagement in Physical Science

a.Observations and experiments in Physical sciences: interdisciplinary linkages,

b. Relating knowledge to students daily life situations.

c. Providing opportunities for group activities and idea Sharing

d. Group/Individual Presentation

e. Designing different working Models for concept formation

f. Teaching aids and activities in laboratory work

g. Reflective written assignment

**Unit 5: Assessment & Evaluation of Physical Sciences learning**

1. Meaning, concept and construction of Achievement test,
2. Blue print: Meaning, concept, need and construction.
3. Open-book tests: Strengths and limitations
4. Formative and Summative Assessment in Biology.
5. Continuous and Comprehensive Evaluation (CCE)
6. Assessment of project work in physics & chemistry (both in the laboratory and in the field )
7. Performance-based assessment; learner's record of observations, Oral presentation of learners work, portfolio;
8. Developing assessment framework in physics & chemistry; assessment of experimental work in physics & chemistry.

**Practicum/Field WorkAny two of the following**

1. Prepare a concept map on any topic and explain how it Facilitates Students' Learning.
2. Description and Design of an Improvised Apparatus
3. Write a reflective journal on 'Radiations and Human Health'.
4. Planning an out of class activity to use local resources to teach physics & chemistry and report your experiences.
5. Prepare a plan to assess Students' Practical work in physics & chemistry.

**References**

1.Heiss, Oburn and Hoffman: Modern Science, the Macmillan Company, New York 1961.

2. Thurber W. and A. Collette : Teaching Science in Today's Secondary schools, Boston Allyan and Bacon Inc., New York, 1959.

3. Vaidya, N. "The Impact of Science Teaching", Oxford and IBH Publishing Company, New Delhi, 1971.

4. Richardson, S. : "Science Teaching in Secondary Schools", Prentice Hall, USA, 1957.

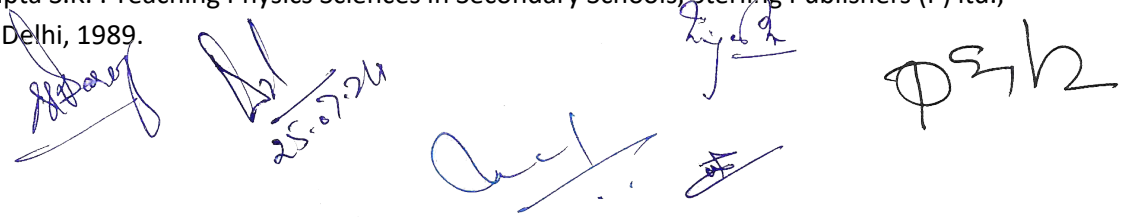
5. Sharma, R.C. and Sukla : "Modern Science Teaching" DhanpatRai and Sons, Delhi, 2002.

6. Ravi Kumar S.K., "Teaching of Science", Mangal deep Publications 2000.

7. RaoAman : Teaching of Physics, Anmol Publications, New Delhi, 1993.

8. WadhwaShalini : Modern Methods of Teaching Physics, Sarup and Sons, New Delhi, 2001.

9. Gupta S.K. : Teaching Physics Sciences in Secondary Schools, Sterling Publishers (P) ltd., New Delhi, 1989.



## 702 Pedagogy of Mathematics

***OBJECTIVES: The students will be able to*** ***MAX. MARKS: 100***

1.Gain insight into the meaning, nature, scope and objectives of mathematics education.
2.Appreciate mathematics as a tool to engage the mind of every student.
3.Understand the process of developing the concepts related to Mathematics.
4.Appreciate the role of mathematics in day to day life.
5.Learn important mathematics: mathematics more than formulas and mechanical procedures.
6.Pose and solve meaningful problems.
7.Construct appropriate assessment tools for evaluation mathematics learning.
8.Understand methods and techniques of teaching mathematics.
9.Perform pedagogical analysis of various Topics in mathematics at secondary level.
10. Understand and use I.C.T. in teaching of mathematics.
11. Understand and use continuous and comprehensive evaluation, diagnostic testing and remedial teaching in Mathematics.

**COURSE CONTENTS**

***Unit: 1 Nature of Mathematics as a Discipline***

1.Mathematics is not merely subject of computations skill, it is much more, it has a logical structure.
2.Nature of mathematics – building blocks of mathematics (Concept, objectives, variables, function & relation, symbolization)
3.Important processes of mathematics-estimation, approximation, understanding or visualizing pattern representation, reasoning & proof, making connections, mathematical communication.
4.Historical development of mathematics as a discipline Contribution of Indian and western mathematicians like Ramanujan, Aryabhatt, Bhaskarcharya, Pythogorous and Euclid.
5. Constructivist approach in learning mathematics.

**Unit: 2 Mathematics as a School Subject**

1.Importance of mathematics in school curriculum.
2.Aims and objectives of teaching mathematics at secondary level. Writing objectives in behavioral terms. Bloom's taxonomy (revised)
3.Correlation of mathematics with other school subjects.
4.Changing trends and goals of teaching mathematics with reference of NCF 2005
5.Concept mapping of themes related to mathematics.

**Unit: 3 Mathematics as a School Subject**

1.Nature of concept, concept formation and concept assimilation.
2. Methods of teaching mathematics at secondary level –
(a)Lecture cum demonstration
(b)Inductive-Deductive
(c)Problem Solving
(d) Project
(e)Heuristic
(f)Analytic & Synthetic
2. Techniques of teaching mathematics

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(a)Oral work
(b)Written work
(c)Drill work
(d)Home assignment

**Unit: 4 Pedagogical analysis and mode of learning engagement**

1.Pedagogical analysis of the units with reference to concepts, learning outcomes, activities and learning experiences and evaluation techniques of following content at secondary level-

(a)Number system
(b)Measures of central tendency
(c)Congruency and similarity
(d)Trigonometrical ratios and identities
(e)Area and Volume
(f)Profit, loss and partnership
(g)Compound interest
(h)Graphical representation data

2. Modes of learning engagement in mathematics

(a)Providing opportunities for group activities
(b)Group/Individual Presentation
(c)Providing opportunities for sharing ides
(d)Designing different Working Models for concept formation
(e)Teaching aids and activities in laboratory work
(f)Reflective written assignments

**Unit: 5 Assessment & Evaluation of Mathematics learning**

1.Assessment of critical thinking, logical reasoning and to discourage mechanical manipulation and rote learning

a)Planning of evaluation mathematics
b)Formative, Summative and predictive evaluation in mathematics
c) Continuous and compressive evaluation (CCE) in mathematics at secondary level
d) Diagnostic Testing, Remedial Teaching and enrichment programme for:

i. Gifted Learners
ii. Slow Learners
iii. Learners with Dyslaxica
iv. Difficulties Faced by the Teacher in Teaching of Mathematics and Suggestive Measure to overcome them.

2. Construction of achievement test/question paper in mathematics

Practicum/Field WorkAny two of the following1.Prepare a Concept map related to any theme of Mathematics and Explain how it facilitates teaching and learning.

2. Prepare a project related to Mathematics and report your steps.
3. Prepare a power point presentation on brief history and contribution of two mathematicians.
4. Conduct a group activity on any topic of mathematics and report your Experiences.
5. Observation of Mathematics class-room teaching in any secondary school and prepare a list of errors committed by students.

25.7.24

**REFERENCES**


1. Mangal, S.K. SadharanGanitShikshan, Arya Book Depot, New Delhi.
2. Bhatnagar A.B. New Dimensions in the teaching of Maths, Modern Publishers, Meerut.
3. Jain S.L.: GanitShikshanSansthan, RajsthanHindiGranthAcademy ,Jaipur.
4. Agrawal S.M. Teaching of Modern Mathematics DhanpatRai& Sons, Delhi.
5. Jagadguru Swami: Vedic Mathematics, MotiLalBanarasidas Publisher, Delhi
6. Kapur J.N. Modern Mathematics for Teachers, Arya Book Depot, New Delhi


## 702 Pedagogy of Biological Science

**Objectives- Student-teachers will be able to:-** ***MAX. MARKS: 100***

1. Develop insight on the meaning and nature of biological science for determining aims and strategies of teaching- learning.
2. Appreciate that science is a dynamic and expanding body of knowledge.
3. Appreciate the fact that every child possesses curiosity about his/her natural surroundings.
4. Identify and relate everyday experiences with learning of biological science.
5. Appreciate various approaches of teaching- learning of biological science.
6. Explore the process, skill in science and role of laboratory in teaching- learning.
7. Use effectively different activities / experiments/ demonstrations / laboratory experiences for teaching-learning of biological science.
8. Integrate the biological science knowledge with other school subjects.
9. Analyze the contents of biological science with respect to Content, process, skills, knowledge organization and other critical issues.
10. Perform Pedagogical analysis of various topics in Physical Sciences.
11. Develop process-oriented objectives based on the content themes/units.
12. To understand meaning, concept and various types of assessment.

**COURSE CONTENT**

**Unit 1: Nature of Biological Science as a Discipline**

1. Meaning, Concept, Nature and Need of Biological science and Biology teaching.
2. Scope of Biological science teaching
3. Historical development of Biological science as a discipline. Contribution of Indian and western Biologist like HargobindKhurana, Mohinder Singh Randhawa, Salim Ali, Mendel, Darwin, and Lamark in the field of Biology
4. Constructivist approach in learning Biological Science.

**Unit 2: Biological Science as a school subject**

1. Importance of Biological science in school curriculum.
2. Aims & objectives of teaching Biological science at school level. Writing objectives in behavioural terms. Bloom's taxonomy (revised).
3. Correlation of Biological Science with other School Subjects
4. Changing trends and goals of teaching Biology

**Unit 3: Methodology of Teaching and learning of Biological science**

1. Scientific attitude and scientific temper: Nurture the natural curiosity, aesthetic senses and

creativity in biology: essential skills, methods and process that lead to exploration, Generalization and validation of scientific knowledge in biological science.

2.Lecture –cum Demonstration, Team teaching, Project method, Problem solving method, Inquiry approach, Programmed instruction, Investigatory approach, Concept mapping, Collaborative learning, and Experiential learning in biological science: Facilitating learners for self-study.

**Unit 4: Pedagogical Analysis and mode of learning Engagement**

1.Pedagogical analysis of the units with reference to concepts, learning outcomes, activities and learning experiences and evaluation techniques of following content at secondary and Senior Secondary levelBiological science for environment and health, peace, equity, origin of life and evolution,biodiversity, Photosynthesis, Life processes and factors affecting it.

2.Modes of learning engagement in Biological Sciencea. Observations and experiments in biological sciences: interdisciplinary linkages,

b. Providing opportunities for group activities

c. Group/Individual Presentation

d. Providing opportunities for sharing ideas

e. Designing different working Models for concept formation.

f. Teaching aids and activities in laboratory work

g. Reflective written assignment

**Unit 5: Assessment & Evaluation in Biological Sciences**

1. Meaning, concept and construction of Achievement test

2. Blue print: Meaning, concept, need and construction.

3. Construction of test items (open-ended and structured) in biological science and administration of tests.

4. Open-book tests: Strengths and limitations

5. Formative and Summative Assessment in Biology.

6. Continuous and Comprehensive Evaluation (CCE)

7. Assessment of project work in biology (both in the laboratory and in the field)

8. Performance based assessment: learners' record of observations, field diary, herbarium and collection of materials.

9. Oral presentation of learners' work in biological science, portfolio;

10. Developing assessment framework in biological science; assessment of experimental work in biological science.

**Practicum/Field Work (Any Two of the following)-**

1. Preparation of Scrap book to show the Contribution of any two Biologist
2. Conduct any activity among students for linking child's natural curiosity with natural phenomena like weather, flora and fauna; contexts. Report your Observations.
3. Preparation/ designing programmed instruction material on any topic of Biology to facilitate learners for self –study.
4. Prepare a low cost or waste material based experiment for secondary/ senior secondary schools.
5. Prepare a plan to assess Students' Practical work in Biology.

25.7.24

**References**


1.Sood.J.K., 1987: Teaching Life Sciences, KohaliPublisher,Chandigarh.

2. Sharma, L.M., 1977: Teaching of Science & Life Science, DhanpatRai&Sons,Delhi

3. Kulshrestha, S.P., 1988: Teaching of Biology,Loyal Book Depot ,Meerut

4. Yadav K., 1993: Teaching of Life Science, AnmolPublisher,Daryaganj Delhi.

5. Yadav,M.S., 2000 : Modern Methods of Teaching Science, Anmol Publishers, Delhi.

6. Singh, U.K.&Nayab, A.K., 2003: ScienceEducationCommonwealth Publishers, Daryaganj,New Delhi

7. Venkataih, S., 2001: Science education in 21st century Anmol Publishers, Delhi

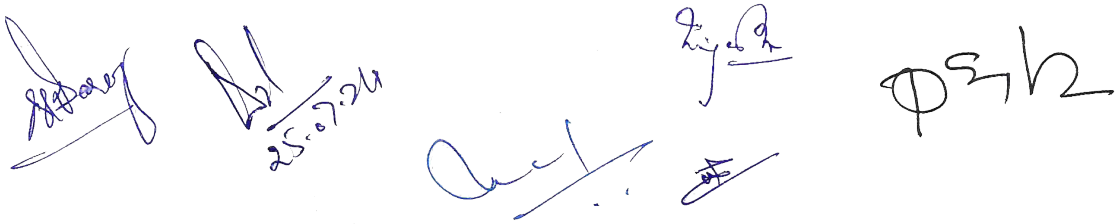
8. Yadav,M.S.(Ed.), 2000 : Teaching Science at Higher Level, AnmolPublishers,Delhi

9. Ediger,Marlow&Rao, D.B., 2003 : Teaching Science Successfully Discovery Publishing House, New Delhi

10. Mangal, S.K., 1996: Teaching of Science, Arya Book Depot, New Delhi

11. Dave,R.H., 1969 : Taxonomy of Educational objectives & Achievement Testing, London University Press, London.

12. Sood,J.K., 1989 : New Directions in Science Teaching, Kohli Publishers, Chandigarh.

# SEMESTER VIII

## CHEMISTRY

***801 PHYSICAL CHEMISTRY*** ***MAX. MARKS: 75***

**Unit I: Elementary Quantum Mechanics**

Black-body radiation, Planck's radiation law, photoelectric effect. Compton effect, De Broglie hypothesis, the Heisenberg's uncertainty principle, Schrodinger wave equation and its importance, physical interpretation of wave function.

Adsorption: Difference between adsorption, absorption and sorption, Chemisorption, adsorbent and adsorbate, reversible and irreversible adsorption, characteristics of adsorption, adsorption of gases by solids, factors affecting adsorption, types of adsorption, types of adsorption isotherms, Freundlich and Langmuir adsorption isotherms. Numericals

**Unit II:Spectroscopy**

Introduction: electromagnetic radiation, regions of the spectrum, Basic features of different Spectrometers, Born-Oppenheimer approximation, degrees of freedom. Rotational Spectrum: Diatomic molecules, Energy levels of a rigid rotator (semi-classical principles), selection rules, spectral intensity, distribution using population distribution(Maxwell- Boltzmann distribution) determination of bond length, qualitative description of non-rigid rotator, isotope effect. Numericals.

**Unit III: Vibration and Raman Spectroscopy**

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. Raman Spectroscopy: concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules. Numericals.

**Unit IV: Electronic Spectrum:** Origin of electronic spectrum, Selection rules, vibrational course structure and rotational fine structures considering no interaction of rotational and vibrational energies. qualitative description of selection rules and Franck-Condon principle.

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). Numericals

**Unit V: Solid State**: Crystal state, classification of crystals, space lattice, unit cell.

Laws of crystallography – (i) Law of constancy of interfacial angles (ii) Law of rationality of indices (iii) Law of symmetry. Symmetry elements in crystals. X-ray diffraction by crystals.Derivation of Bragg equation. Determination of crystal structure of NaCl, KCl and CsCl (Laue's method and powder method). Numericals.

***Books Suggested:***

1. The Elements of Physical Chemistry, P.W. Atkins, Oxford.
2. Physical Chemistry Through problems, S.K. Dogra and S. Dogra, Wiley Eastern Ltd.
3. Principles of Physical Chemistry, B.R. Puri, L.R. Sharma and M.S. Pathania,

4. ShobhanLalNagin Chand & Co.
5. Physical Chemistry by S.C.Ameta, A.V.Singh, R.Ameta, R.Mathur
6. BhoticRasayan by K.R. Genwa, RBD, Jaipur.

***Practicals*** ***MAX. MARKS: 25***

Laboratory Course

Organic Chemistry:

(a) Qualitative Analysis: - Analysis of an organic mixture is containing two solid components, using wate,$NaHCO_3$ and NaOH for separation. [10]

(b) Synthesis of organic compounds:- [10]

(i) Acetylation of salicylic acid, aniline and p-nitroacetanilide.

(ii) Preparation of iodoform from ethanol and acetone.

(iii) Preparation of methyl orange.

Viva-Voce [5]

Internal (Sessional/Record) [10]

***Books Suggested (Laboratory Courses):***

1. Practical Chemistry, S.Giri, D.N.Bajpai and O.P.Pandey Publ. S. Chand
2. Experimental Organic Chemistry Vol I & II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.
3. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
4. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
5. Experiments in General Chemistry, C.N.R. Rao and U.C. Agarwal, East-West Press.

## PHYSICS

***801 RELATIVITY AND ELECTRODYNAMICS*** ***MAX. MARKS: 75***

**Unit I:**Electromagnetic Waves: Displacement current, Maxwell's equations, Electromagnetic wave equation, Poynting theorem, Plane Electromagnetic waves in free space, waveimpedance of free space, Propagation of plane Electromagnetic waves in non-conductingand conducting media, Skin depth, propagation of Electromagnetic waves in ionizedgases, Polarization of Electromagnetic waves.

**Unit II:**Reflection and Refraction of Electromagnetic waves: Boundary conditions at the surface of discontinuity, reflection and refraction of Electromagnetic waves at the interface of non-conducting media, Fresnel's equations and their experimental verification, reflection and transmission coefficients, Brewster's Law and degree of polarization, total internal reflection, phase difference between parallel and perpendicular components and polarization of the reflected wave, reflection from a conducting plane.

**Unit III:**Interaction of Electromagnetic waves with matter: Normal and anomalous dispersion of light, empirical relations, Lorentz theory of dispersion of gases, experimental demonstration of anomalous dispersion in gases, scattering of electromagnetic waves and scattering parameters, Thomson, resonant and Rayleigh's scattering cross-section, polarization of scattered light, coherent and incoherent scattered light, dispersion in liquids and solids, ClaussiusMossotti equation and Lorentz-Lorentz formula.

**Unit IV:**Relativistic Mechanics: Coordinate transformation, contravariant and covariant

vectors, tensors of second and higher rank, addition, subtraction, contraction, outer and inner product of tensors, covariance of tensor equations, Minkowski space, geometrical interpretation of Lorentz transformation, space like and time like intervals, four vectors, four dimensional gradient, divergence and curl operators, four-velocity, four-acceleration, four-momentum, fourforce, relativistic classification of particles.

**Unit V:**Relativistic Electrodynamics: Invariance of charge, transformation of surface charge density, transformation of volume-charge density and current density, Equation of continuity in the covariant form, Scalar and vector potentials, Transformation of Electromagnetic potentials, Lorentz condition and its covariant form, Electromagnetic field tensor, Covariance of Maxwell's equations, Transformation of Electro-Magnetic fields, Lorentz-force in a covariant form,Electromagnetic field due to a moving charge.

***Books suggested:***

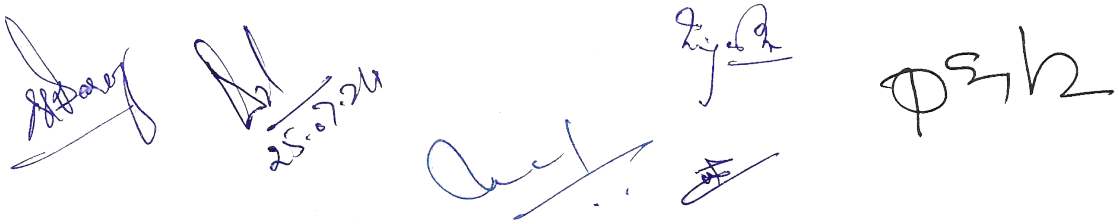
1. S.P. Puri: Electrodynamics, Tata McGraw Hill.
2. J.D. Jackson: Classical Electro-dynamics, John Wisely, New York
3. B.B. Laud: Electromagnetic, John Wisely, New York
4. E.C. Jordan: Electromagnetic waves, PHI, New Delhi
5. D. J. Griffiths: Introduction to Electrodynamics, PHI

**EXPERIMENTS FOR PRACTICAL WORK** ***MAX. MARKS: 25***

Note: Any 13 experiments to be performed by all the students out of following list.

1. Determination of Planck's constant using solar cell/ LED.
2. Determination of Stefan's constant (B-B method).
3. Study of characteristics of a GM counter and verification of inverse square law for the same strength of a radioactive source.
4. Determination of coefficient of rigidity as a function of temperature using torsional oscillator (resonance method).
5. e/m measurement by Helical Method.
6. Measurement of magnetic field using Ballistic galvanometer and search coil.
7. Measurement of electric charge by Millikan's oil drop method.
8. To study hysteresis loss of transformer by B-H curve using CRO.
9. Determination of dielectric constant of solids and liquids.
10. Determination of velocity of sound in air.
11. Verification of Cauchy's formula.
12. Study of Lissajous patterns.
13. Determination of separation of plates of Etalon using spectrometer.
14. To verify Fresnel's formula for the reflection of light.
15. Study of series and parallel LCR resonance circuit.
16. Study of characteristics of a GM counter and determination of dead time of GM tube.
17. To study the viscous fluid damping of a compound pendulum and to determine the dampingNcoefficient and Q of the Oscillator.

Note: - New experiments may be added on availability of equipments.



**MATHEMATICS**

***801 Mechanics–I*** ***MAX. MARKS: 100***

***(Statics and Dynamics of a Particle)***

**Unit I:** Resultant and equilibrium of coplanar forces acting on a rigid body. Friction.

Stable and Unstable equilibrium. Forces in three dimensions, Poinsot's central axis, Wrenches.

**Unit II**: Virtual work and common catenary.

Velocities and accelerations along radial and transverse directions and along tangential and normal directions. Simple harmonic motion and motion under inverse square law.

**Unit III:** Motion on smooth and rough plane curves, circular and cycloidal motions. Central forces and central orbits (excluding planetary motion).

***Mechanics – II***

***(Dynamics of Rigid Bodies and Hydrostatics)***

**Unit IV:** Moments and Products of inertia. D'Alemberts' principle, the general equations of motion of a rigid body, Motion of the center intertia and motion relative to the center of inertia. Motion about a fixed axis under finite forces.

The compound Pendulum. Reaction of the Axis of rotation. Motion of a rigid body in two dimension under finite forces.

**Unit V**: Fluids and Fluid Pressure, homogeneous and heterogeneous fluids, Surface of equal pressure, fluid at rest under action of gravity, Fluid pressure on Plane surfaces.

Centre of pressure, resultant pressure on curved surfaces.Equilibrium of floating bodies, Centre of buoyancy, Surface of buoyancy. Stability of equilibrium of floating bodies, Meta Centre.

**SUGGESTED BOOKS**


S.L. Ioney : Statics

R.S. Verma : A Text Book on Statics; S. Chand & Co., New Delhi.

S.L. Loney : Dynamics of a particle & Rigid bodies.

Ray, M : A Text book on Dynamics; S. Chand & Co., New Delhi

Gokhroo, Saini & Yadav : Higher Dynamics II (Hindi Ed.); Navkar Prakashan, Ajmer

Bhargava, Agarwal : Dynamics (Hindi Ed. );Jaipur Publishing House, Jaipur

Bhargava, Agarwal, Gupta : Statics (Hindi Ed.); Jaipur Publishing House, Jaipur

Gokhroo : Statics (Hindi Ed.); Navkar Prakashan, Ajmer.

Loney, S.L. : Rigid Body Dynamics; Cambridge Univ. Press.

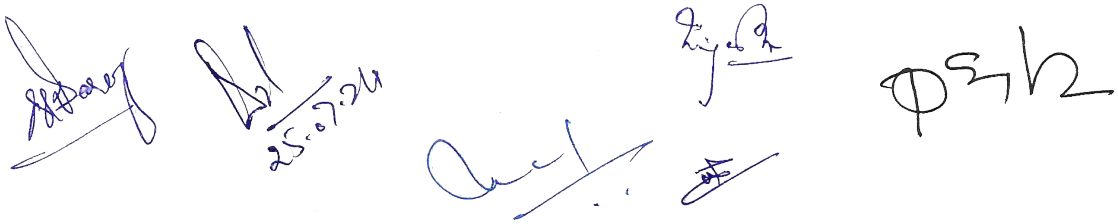
Gupta, P.P. : Rigid Body Dynamics, Vol.I; Krishna Prakashan, Mandir; Meerut

Bansal, J.L. : Rigid Body Dynamics; Jaipur Publishing House, Jaipur.

Prasad, B.N. : Hydrostatics; Krishna Prakashan, Mandir; Meerut

Mathur, S.M. : A Text Book of Hydrostatics; Ramesh Book Depot, jaipur.

Sharma, Gokhroo,kSaini, Agarwal.: Elements of Hydrostatics; Jaipur Publishing House, Jaipur.

# BOTANY

***801 PLANT PHYSIOLOGY AND BIOCHEMISTRY*** ***MAX. MARKS: 75***

**Unit I: Plant-water relations**: Importance of water to plant life; physical properties of water; 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 Transport of organic substances: Mechanism of phloem transport; source-sink relationship; factors affecting translocation

**Unit II: Photosynthesis:** Significance; historical aspects; photosynthetic pigments; action spectra and enhancement effects; concept of two photosystems; Z-scheme; photophosphorylation; Calvin cycle; C4 pathway; CAM plants; photorespiration. Rubisco and its regulation.

**Unit III: Respiration:** Aerobic and anaerobic respiration; Kreb's cycle; electron transport mechanism (chemi – osmotic theory); redox potential; oxidative phosphorylation pentose phosphate pathway Basics of enzymology: Discovery and nomenclature; characteristics of enzymes; concept of holoenzyme, apoenzyme, coenzyme and cofactors; regulation of enzyme activity; mechanism of action, Protein structures.

**Unit IV: Nitrogen and lipid metabolism**: Biological Nitrogen fixation and metabolism. Importance of nitrate reductase and its regulation; ammonium assimilation. Structure and function of lipids; fatty acid biosynthesis; β-oxidation; saturated and unsaturated fatty acids; storage and mobilization of fatty acids.

**Unit V: Growth and development:** Definitions; phases of growth and development. Seed dormancy, seed germination. Photoperiodism, physiology of flowering; florigen concept, biological clocks, vernalization. physiology of senescence, fruit ripening. Plant hormones-auxins, gibberellins, cytokinins, abscisic acid and ethylene, history of their discovery, Physiological role and mode of action.Photomorphogenesis; phytochromes and cryptochromes.

***Suggested Laboratory Exercises***

1. To study the permeability of plasma membrane using different concentrations of organic solvents
2. To study the effect 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. Comparison of the rate of respiration of various plant parts
6. Separation of chloroplast pigments by solvent method
7. Determining the osmotic potential of vacuolar sap by plasmolytic method
8. Determining the water potential of any tuber
9. Separation of amino acids in a mixture by paper chromatography and their identification by comparison with standards
10. Bioassay of auxin, cytokinin, GA, ABA and ethylene using appropriate plant material
11. To study the regulation of stomatal movement using growth regulators, KCl and antitranspirants

***Suggested Readings***

Dennis, D.T., Turpin, D.H., Lefebvre, D.D. and Layzell (eds.). Plant Metabolism (2nd ed.), Longman, Essex, England, 1997

Galston, A.W. Life processes in Plants, Scientific American Library, Springer-Verlag, New York, USA, 1989

Hopkins, W.G. Introduction to Plant Physiology, John Wiley & Sons, Inc., New York, USA, 1995

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Lea, P.J. and Leegood, R.C. Plant Biochemistry and Molecular Biology, John Wiley & Sons, Chichester, England, 1999
Mohr, H. and Schopfer, P. Plant Physiology, Springer-Verlag, Berlin, Germany, 1995
Salisbury, F.B. and Ross, C.W. Plant Physiology (4th ed.), Wadsworth Publishing Co., California, USA,1992
Srivastava, H.S. Plant Physiology, Rastogi Publication, Meerut, 2016
Taiz, L. and Zeiger, E. Plant Physiology (2nd ed.), SinauerAssociats, Inc. Publishers, Massachusetts, USA, 1998

***Laboratory Exercises/PRACTICAL*** ***MAX. MARKS: 25***

Amar Singh. Practical Plant Physiology, Kalyani Publishers, New Delhi, 1977
Moore, T.C. Research Experiences in Plant Physiology: A Laboratory Manual, Springer-Verlag, Berlin,1974
Nifa, A.J. and Ballou, D.P. Fundamental Laboratory Approaches for Biochemistry and Biotechnology, Fitzrierald Science Press, Inc., Maryland, USA, 1998
Robalts and Tucker, G.A. (Eds.) Plant Hormone Protocols, Humana Press, New Jersey¸ USA, 2000
Scot, R.P.W. Techniques and Practice of Chromatography Marcel Dekker, Inc., New York, 1995
Wilson, K. and Goulding, K.H. A Biologists Guide to principles and techniques of Practical Biochemistry, Ed-ward Arnold, London, 1986

**Suggested Laboratory Exercises**

1. Demonstration of the technique of micropropagation by using different explants, e.g. auxiliary and shoot meristems
2. Demonstration of the techniques of anther culture
3. Isolation of protoplasts from different tissues using commercially available enzymes
4. Demonstration of root and shoot formation from the apical and basal portions of stem segments in liquid medium containing different hormones
5. Demonstrations/poster on GM crops and related issues
6. Extraction of DNA from given plant materials

## ZOOLOGY

***801 Ecology and Behaviour*** ***MAX. MARKS: 75***

**Unit I:** Introduction of ecology, definition, history, sub division and scope of ecology. Envirnmental factors; physical factors- soil, water, air and temperature. Biotic factors interspecific and intraspecific relations, neutralism, mutualism, commensalism, antibiosis, parasitism, predation, competition. Concept of limiting factors, Liebig's law of minimum, Shelford's law of tolerance, combined concept of limiting factors.

**Unit II**: Population and community ecology, measurement of population density, Factors affecting population growth, growth factors, dispersal, characteristic of community, concept of ecosystem and niches.Food chain, food web, Ecological pyramid. Energy flow in an ecosystem, biogeochemical cycles of CO2, N2, O2, S and P; Prospects and stratigies ofsustainable development.

**Unit III:** Brief introduction to the major ecosystem of the world and ecological succession, conservation of natural resources; Ecology in relation to Thar desert, Brief account of environmental pollution, global warming and its impact upon Human race.

**Unit IV:** General survey of various types of animal behavior; Methods of studying animal behavior, Role of hormones and pheromones in behavior, Biological rhythms.

**Unit V**: Learning and Memory: Conditioning, Habituation, Insight learning, Association learning, Reasoning and Communication; Wildlife of Rajasthan and its conservation. Odum : Ecology (Amerind)

**Practical** ***MAX. MARKS: 25***

Measurement of temperature and relative humidity.

Estimation of soil moisture.

Estimation of water holding capacity of different soils.

Ecosystem study : Aquarium.

Pond water study to identify zoo-planktons and their permanent preparations.

Permanent preparation of any two stored grain pests. Two parasitic insects and termites.

***List of Recommended Books:***

Odum : Fundamentals of Ecology (W.B. Saunders)

Ricklefy: Ecology (W.H. Freeman)

Turk and Turk: Environmental Science (W.B. Saunders)

Dobzhansky, Ayala & Valentine: Evolution (W.H. Freeman)

Dobzhansky: Genetics and Origin of species (Columbia University Press)

Major: Population, Species & Evolution

White: Animal Cytology & Evolution.

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