

## Scheme of Examination for Recruitment of Finance Officer through LDCE

The written test is of 150 marks (150 objective type multiple choice questions) carrying 01 mark for each question. The duration of written test will be 150 minutes. The question papers are divided in three sections

Section name (Nature of Questions)	No. of items
<b>Part-I: Administration &amp; Accounts – 100 Marks</b> <ol style="list-style-type: none"> <li>1. Maintenance of Cash Book – 05 marks</li> <li>2. Preparation of Bank Reconciliation Statement -05 marks</li> <li>3. Posting of Ledger Accounts – 05 marks</li> <li>4. Preparation of Trial Balance and Final Accounts -05 marks</li> <li>5. Principles of Auditing – 10 marks</li> <li>6. General Financial Rules 2017 related to Purchase of general stores/ services and award to contract etc. &amp; PFMS – 25 marks</li> <li>7. Fundamental Rules and Supplementary Rules - 10 marks</li> <li>8. CCS (Pension) Rules, New Pension Scheme -10 marks</li> <li>9. T.A. Rules – 05 marks</li> <li>10. Medical Attendance Rules – 05 marks</li> <li>11. Provident Fund Rules -05 marks</li> <li>12. Delegation of Financial Powers &amp; Norms to various Authorities under Vidyalaya Vikas Nidhi and School Fund – 10 marks</li> </ol>	100 questions
<b>Part-II:</b> <b>General Knowledge – 10 marks</b> <ul style="list-style-type: none"> <li>• Current Affairs/ events of national and international importance.</li> <li>• History of India and Indian National Movements.</li> <li>• Indian and World geography – Physical, Social, Economic geography of India and the World etc.</li> <li>• Indian Polity and Governance – Constitution, Political System, Panchayati Raj, Public Issues, Articles, Rights etc.</li> <li>• Economic and Social Development – Sustainable development, Poverty, Inclusion, Demographics, Social Sector initiatives etc.</li> <li>• General issues on Environment, Ecology, Bio-diversity, Climate change, General Science and General Computer &amp; Computer Literacy.</li> </ul>	10 questions
<b>Reasoning Aptitude -15 marks</b> <ul style="list-style-type: none"> <li>• General Mental/ Analytical Ability.</li> <li>• Verbal/ Logical reasoning, Relations &amp; Hierarchies.</li> <li>• Analogies, Assertion, Truth Statements.</li> <li>• Coding &amp; Decoding, Situational Reasoning.</li> <li>• Series and Patterns involving worlds &amp; alphabets.</li> </ul>	15 questions
<b>Quantitative Aptitude – 15 Marks</b> <ul style="list-style-type: none"> <li>• Two and Three dimensional/ Venn diagrams based questions.</li> <li>• Number patterns, Series, Sequences, Basic numeracy (numbers &amp; their relations, orders of magnitude etc.).</li> <li>• Arithmetic aptitude, Data interpretation (Charts, Graphs or Tables, Data sufficiency etc.).</li> <li>• Direction sense, Analysis and interpretation in various contexts.</li> </ul>	15 questions
<b>General Hindi &amp; General English-10 Marks</b> Proficiency related to Communication and Comprehension	10 questions

**Note:** Minimum 40% marks would qualify for empanelment.

## **Scheme of Exam for Recruitment of Principals through LDCE:**

The written test is of 180 marks (180 objective type multiple choice questions) carrying 01 mark for each question. The duration of written test will be 180 minutes.

### **Section name - Nature of Questions**

#### **Part I - General awareness, Reasoning & Proficiency in Languages (40 marks):**

- (a) General Awareness (10 questions)
- (b) Reasoning Ability (10 questions)
- (c) General English (10 questions) -Reading comprehension, word power, Grammar & usage
- (d) General Hindi (10 questions) - पठनकौशल,शब्दसामर्थ्य,व्याकरणएवंप्रयुक्ति

#### **Part-II: Perspectives on Education and Leadership (70 marks)**

- (a) Perspectives in Education (10 questions)
- (b) Understanding the Learner-(15 questions)
- (c) Understanding Teaching Learning -(10 questions)
- (d) Creating Conducive Learning Environment - (10 questions)
- (e) School Organization and Leadership - (15 questions)
- (f) KVS Education Code(10 questions)

#### **Part III -School Administration & Finance -(70 marks)**

**Note:** Minimum 40% would qualify for empanelment.

## **Syllabus of Exam for Recruitment of Principals through LDCE:**

#### **Part I - General awareness, Reasoning & Proficiency in Languages (40 Marks)**

- a) General Awareness (10 questions)
- b) Reasoning Ability (10 questions)
- c) General English (10 questions) -Reading comprehension, word power, Grammar & usage
- d) General Hindi (10 questions) - पठनकौशल,शब्दसामर्थ्य,व्याकरणएवंप्रयुक्ति

#### **Part II - Perspectives on Education and Leadership (70 Marks)**

##### **(a)Perspectives in Education (10 questions)**

- Role of school in achieving aims of education.
- NEP-2020:Early Childhood Care and Education: The Foundation of Learning ; Foundational Literacy and Numeracy; Curriculum and Pedagogy in Schools: Holistic& Integrated Learning; Equitable and Inclusive Educa4tion: Learning for All; Competency based learning and Education.
- Guiding Principles for Child Rights, Protecting and provisioning for rights of children to safe and secure school environment, Right of Children to free and Compulsory

Education Act, 2009,

- Historically studying the National Policies in education with special reference to school education;
- School Curriculum Principles: Perspective, Learning and Knowledge, Curricular Areas, School Stages – Pedagogy & Assessment.

**(b) Understanding the Learner (15 questions)**

- Concept of growth, maturation and development, principles and debates of development.
- Development tasks and challenges with special reference to the primary and middle school children.
- Domains of Development: Physical, Cognitive, Socio-emotional, Moral etc., deviations in development and its implications.
- Role of Primary and Secondary Socialization agencies. Steps to ensure Home school continuity.
- Mental Health and well-being (MANODARPAN)

**(c) Understanding Teaching Learning (10 questions)**

- Theoretical perspectives on Learning -Behaviorism, Cognitivism and Constructivism with special reference to their implications for:
  - I. The role of Principal
  - II. The role of teacher
  - III. The role of learner
  - IV. Nature of teacher-student relationship
  - V. Choice of teaching methods
  - VI. Classroom environment
  - VII. Understanding of discipline, power etc.
- **Factors affecting learning and their implications for:**
  - I. Designing classroom instructions,
  - II. Planning student activities and,
  - III. Creating learning spaces in school.
- **Planning and Organization of Teaching-Learning**
  - I. Concept of Syllabus and Curriculum, Overt and Hidden Curriculum
  - II. Preparation of School Time-table
  - III. Foundational Literacy and Numeracy, Early Childhood Care and Education
  - IV. Competency based Education, Experiential learning, etc.
  - V. Instructional Plans: -Year Plan, Unit Plan, Lesson Plan
  - VI. Instructional material and resources
  - VII. Information and Communication Technology(ICT) for teaching-learning
  - VIII. Assessment of learning, for learning and as learning: Meaning, purpose and considerations in planning each.
  - IX. Enhancing Teaching Learning processes: Classroom Observation and Feedback, Reflections and Dialogues as a means of constructivist teaching

**(d) Creating Conducive Learning Environment (10 questions)**

- Inclusive Education: The concepts of Diversity, disability and Inclusion, implications of disability as social construct, types of disabilities-their identification and interventions
- Concept of School Mental Health, addressing the curative, preventive and promotive dimensions of mental health for all students and staff. Provisioning for guidance and counselling.

- Developing School and community as a learning resource.

**(e) School Organization and Leadership (15 questions)**

- Leader as reflective practitioner, team builder, initiator, coach and mentor.
- Perspectives on School Leadership: instructional, distributed and transformative
- Vision building, goal setting and creating a School development Plan
- Using School Processes and forums for strengthening teaching learning-Annual Calendar, time-tabling, parent teacher forums, school assembly, teacher development forums, using achievement data for improving teaching –learning, School Self-Assessment and Improvement
- Creating partnerships with community, industry and other neighboring schools and Higher Education Institutes – forming learning communities

**(f) KVS Education Code (10 questions)**

**Part-III: School Administration & Finance (70 Marks)**

- KVS Accounts Code
- Office Management
- CCS (CCA) Rules
- CCS (Conduct) Rules
- Fundamental & Supplementary Rules
- TA Rules
- Leave Travel Concession Rules
- Medical Attendance Rules
- Income Tax & GST
- POSH & POCSO Acts
- MoE, NCPCR and NIDM guidelines for school safety and security
- Constitutional Provisions for PWD, EWS, SC/ST and other disadvantaged groups
- GFR – 2017,
- Pension, NPS.
- Office Accounting & PFMS

**Note:**

- **Qualifying marks for empanelment is 40%.**

## Scheme of Exam for Recruitment of Vice Principal through LDCE:

The written test is of 180 marks (180 objective type multiple choice questions) carrying 01 mark for each question. The duration of written test will be 180 minutes.

### Section Name -Nature of Questions

#### Part I - General awareness, Reasoning & Proficiency in Languages (40 marks):

- (a) General Awareness (10 questions)
- (b) Reasoning Ability (10 questions)
- (c) General English (10 questions) -Reading comprehension, word power, Grammar & usage
- (d) General Hindi (10 questions) - पठन कौशल, शब्द सामर्थ्य, व्याकरण एवं प्रयुक्ति

#### Part-II: Perspectives on Education and Leadership (90 marks)

- (a) Understanding the Learner-(15 questions)
- (b) Understanding Teaching Learning -(20 questions)
- (c) Creating Conducive Learning Environment - (15 questions)
- (d) School Organization and Leadership - (15 questions)
- (e) Perspectives in Education (10 questions)
- (f) KVS Education Code(15 questions)

#### Part III -School Administration & Finance -(50marks)

**Note:** Minimum 40% would qualify for empanelment.

## Syllabus of Exam for Recruitment of Vice Principal through LDCE:

### Part I - General awareness, Reasoning & Proficiency in Languages (40 Marks)

- a) General Awareness
- b) Reasoning Ability
- c) General English - Reading comprehension, word power, Grammar & usage
- d) General Hindi - पठन कौशल, शब्द सामर्थ्य, व्याकरण एवं प्रयुक्ति

### Part II - Perspectives on Education and Leadership (90 Marks)

#### (a) Understanding the Learner

- Concept of growth, maturation and development, principles and debates of development,
- Development tasks and challenges with special reference to the primary and middle school children
- Domains of Development: Physical, Cognitive, Socio-emotional, Moral etc., deviations in development and its implications.
- Role of Primary and Secondary Socialization agencies. Steps to ensure Home school continuity.

#### (b) Understanding Teaching Learning

- Theoretical perspectives on Learning -Behaviorism, Cognitivism and Constructivism with

special reference to their implications for:

- i. The role of teacher
  - ii. The role of learner
  - iii. Nature of teacher-student relationship
  - iv. Choice of teaching methods
  - v. Classroom environment
  - vi. Understanding of discipline, power etc.
- Factors affecting learning and their implications for:
    - i. Designing classroom instructions,
    - ii. Planning student activities and,
    - iii. Creating learning spaces in school.
  - Planning and Organization of Teaching-Learning
    - i. Concept of Syllabus and Curriculum, Overt and Hidden Curriculum
    - ii. Preparation of School Time-table
    - iii. Foundational Literacy and Numeracy, Early Childhood Care and Education
    - iv. Competency based Education, Experiential learning, etc.
    - v. Instructional Plans: -Year Plan, Unit Plan, Lesson Plan
    - vi. Instructional material and resources
    - vii. Information and Communication Technology(ICT) for teaching-learning
    - viii. Assessment of learning, for learning and as learning: Meaning, purpose and considerations in planning each.
  - Enhancing Teaching Learning processes: Classroom Observation and Feedback, Reflections and Dialogues as a means of constructivist teaching

### **(c) Creating Conducive Learning Environment**

- The concepts of Diversity, disability and Inclusion, implications of disability as social construct, types of disabilities-their identification and interventions
- Concept of School Mental Health, addressing the curative, preventive and promotive dimensions of mental health for all students and staff. Provisioning for guidance and counselling.
- Developing School and community as a learning resource.

### **(d) School Organization and Leadership**

- Leader as reflective practitioner, team builder, initiator, coach and mentor.
- Perspectives on School Leadership: instructional, distributed and transformative
- Vision building, goal setting and creating a School development Plan
- Using School Processes and forums for strengthening teaching learning-Annual Calendar, time-tabling, parent teacher forums, school assembly, teacher development forums , using achievement data for improving teaching –learning, School Self Assessment and Improvement
- Creating partnerships with community , industry and other neighbouring schools and Higher Education Institutes – forming learning communities

### **(e) Perspectives in Education**

- Role of school in achieving aims of education.
- NEP-2020: Early Childhood Care and Education: The Foundation of Learning ; Foundational Literacy and Numeracy; Curriculum and Pedagogy in Schools: Holistic& Integrated Learning; Equitable and

Inclusive Education: Learning for All; Competency based learning and Education.

- Guiding Principles for Child Rights, Protecting and provisioning for rights of children to safe and secure school environment, Right of Children to free and Compulsory Education Act, 2009,
- Historically studying the National Policies in education with special reference to school education;
- School Curriculum Principles: Perspective, Learning and Knowledge, Curricular Areas, School Stages – Pedagogy & Assessment.

#### **(f) KVS Education Code**

##### **Part-III: School Administration & Finance (50 Marks)**

- KVS Accounts Code
- Office Management
- CCS (CCA) Rules
- CCS (Conduct) Rules
- Fundamental & Supplementary Rules
- TA Rules
- Leave Travel Concession Rules
- Medical Attendance Rules
- Income Tax & GST
- POSH & POCSO Acts
- MoE, NCPCR and NIDM guidelines for school safety and security
- Constitutional Provisions for PWD, EWS, SC/ST and other disadvantaged groups
- GFR – 2017,
- Pension, NPS

**Note:** Minimum 40% marks would qualify for empanelment.

## Scheme of Exam for Recruitment of Head Masters through LDCE:

The written test is of 180 marks (180 objective type multiple choice questions) carrying 01 mark for each question. The duration of written test will be 180 minutes.

### Section name -Nature of Questions

#### Part I - General awareness, Reasoning (40 marks):

- (a) General English (10 questions)
- (b) General Hindi (10 questions)
- (c) General Awareness & Current Affairs ( 10 question)
- (d) Reasoning Ability (10 questions)

#### Part-II: Perspectives on Education and Leadership (80 questions)

- (a) Understanding the Learner-(15 questions)
- (b) Understanding Teaching Learning -(20 questions)
- (c) Creating Conducive Learning Environment - (10 questions)
- (d) School Organization and Leadership - (10 questions)
- (e) Perspectives in Education (15 questions)
- (f) KVS Education Code (10 questions)

#### Part III - Subject-specific Syllabus (60 marks)

##### Note:

- Minimum 40% would qualify for empanelment.

## Syllabus of Exam for Recruitment of Head Masters through LDCE:

### Part I - General awareness, Reasoning

- a) Proficiency in English
- b) Proficiency in Hindi
- c) General Awareness & Current Affairs
- d) Reasoning Ability

### Part II -Perspectives on Education and Leadership

#### (a) Understanding the Learner

- Concept of growth, maturation and development, principles and debates of development,
- Development tasks and challenges with special reference to the primary and middle school children
- Domains of Development: Physical, Cognitive, Socio-emotional, Moral etc., deviations in development and its implications.
- Role of Primary and Secondary Socialization agencies. Steps to ensure Home school continuity.

#### (b) Understanding Teaching Learning

- Theoretical perspectives on Learning -Behaviorism, Cognitivism and Constructivism with

special reference to their implications for:

- i. The role of teacher
  - ii. The role of learner
  - iii. Nature of teacher-student relationship
  - iv. Choice of teaching methods
  - v. Classroom environment
  - vi. Understanding of discipline, power etc.
- Factors affecting learning and their implications for:
    - i. Designing classroom instructions,
    - ii. Planning student activities and,
    - iii. Creating learning spaces in school.
  - Planning and Organization of Teaching-Learning
    - i. Concept of Syllabus and Curriculum, Overt and Hidden Curriculum
    - ii. Preparation of School Time-table
    - iii. Foundational Literacy and Numeracy, Early Childhood Care and Education
    - iv. Competency based Education, Experiential learning, etc.
    - v. Instructional Plans: -Year Plan, Unit Plan, Lesson Plan
    - vi. Instructional material and resources
    - vii. Information and Communication Technology(ICT) for teaching-learning
    - viii. Assessment of learning, for learning and as learning: Meaning, purpose and considerations in planning each.
  - Enhancing Teaching Learning processes: Classroom Observation and Feedback, Reflections and Dialogues as a means of constructivist teaching

### **(c) Creating Conducive Learning Environment**

- The concepts of Diversity, disability and Inclusion, implications of disability as social construct, types of disabilities-their identification and interventions
- Concept of School Mental Health, addressing the curative, preventive and promotive dimensions of mental health for all students and staff. Provisioning for guidance and counselling.
- Developing School and community as a learning resource.

### **(d) School Organization and Leadership**

- Leader as reflective practitioner, team builder, initiator, coach and mentor.
- Perspectives on School Leadership: instructional, distributed and transformative
- Vision building, goal setting and creating a School development Plan
- Using School Processes and forums for strengthening teaching learning-Annual Calendar, time-tabling, parent teacher forums, school assembly, teacher development forums , using achievement data for improving teaching –learning, School Self Assessment and Improvement
- Creating partnerships with community , industry and other neighbouring schools and Higher Education Institutes – forming learning communities

### **(e) Perspectives in Education**

- Role of school in achieving aims of education.
- NEP-2020: Early Childhood Care and Education: The Foundation of Learning ; Foundational Literacy and Numeracy; Curriculum and Pedagogy in Schools: Holistic & Integrated Learning; Equitable and Inclusive Education: Learning for All; Competency based learning and Education.
- Guiding Principles for Child Rights, Protecting and provisioning for rights of children to safe and secure school environment, Right of Children to free and Compulsory Education Act, 2009,

- Historically studying the National Policies in education with special reference to school education;
- School Curriculum Principles: Perspective, Learning and Knowledge, Curricular Areas, School Stages – Pedagogy & Assessment.

**(f) KVS Education Code**

**Part III - Subject-specific Syllabus – Refer Annexure**

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**Note:**

- Minimum 40% would qualify for empanelment.

## Scheme of Examination for Recruitment of Section Officer through LDCE

The written test is of 150 marks (150 objective type multiple choice questions) carrying 01 mark for each question. The duration of written test will be 150 minutes. The question papers are divided in three sections

Section name (Nature of Questions)	No. of questions
<p><b>Part-I: Office Procedure, Office Management &amp; Reservation policy- 40 Marks</b></p> <p>(Additionally, it will also include miscellaneous general matters relevant to functioning of various sections of KVS where Rules of KVS/ Govt. of India are taken care of while discharging the duties).</p>	40 questions
<p><b>Part-II: General Aptitude – 10 Marks</b></p> <p><b>1. General Knowledge:</b></p> <ul style="list-style-type: none"> <li>• Current Affairs/events of national and international importance.</li> <li>• History of India and Indian National Movements.</li> <li>• Indian and World Geography- Physical, Social, Economic geography of India and the World etc.</li> <li>• Indian Polity and Governance- Constitution, Political System, Panchayati Raj, Public Issues, Articles, Right etc.</li> <li>• Economic and Social-Development, Sustainable Development, Poverty, Inclusion, Demographics, Social Sector Initiatives etc.</li> <li>• General Issues on Environment, Ecology, Bio-diversity,</li> <li>• Climate change, General Science and General Computer &amp; Computer Literacy</li> </ul>	10 questions
<p><b>2. Reasoning Aptitude- 15 Marks</b></p> <ul style="list-style-type: none"> <li>• General Mental/Analytical Ability</li> <li>• Verbal/Logical reasoning, Relations &amp; Hierarchies</li> <li>• Analogies, Assertion, Truth Statements</li> <li>• Coding &amp; Decoding, Situational Reasoning</li> <li>• Series and Patterns involving words &amp; Alphabets</li> </ul>	15 questions
<p><b>3. Quantitative Aptitude - 15 Marks</b></p> <ul style="list-style-type: none"> <li>• Two and Three dimensional/ Venn Diagrams based questions</li> <li>• Number patterns, Series, Sequences, Basic numeracy (Number &amp; their relations, orders or magnitude etc.)</li> <li>• Arithmetic aptitude, Data interpretation (Charts, Graphs or Tables, Data sufficiency etc.)</li> <li>• Direction sense, Analysis and interpretation in Various contexts</li> </ul>	15 questions
<p><b>4. General Hindi &amp; General English – 10 Marks</b></p> <p>Proficiency related to Communication and Comprehension</p>	10 questions

Continued...

<b>Part-III: Administration &amp; Finance – 60 marks</b>	60 questions
<ol style="list-style-type: none"><li>1. General Financial Rules – 05 marks</li><li>2. Travelling Allowance Rules -05 marks</li><li>3. Leave Travel Concession -05 marks</li><li>4. Medical Attendance Rules -05 marks</li><li>5. Pay-Fixation(FR&amp;SR) -05 marks</li><li>6. Leave rules &amp; Joining Time – 05 marks</li><li>7. CCS(CCA)Rules – 10 marks</li><li>8. CCS(Conduct Rules) – 10 marks</li><li>9. CCS (Pension) Rules, NPS &amp; N Provident Fund Rules -10 marks</li></ol>	

**Note:** Minimum 40% marks would qualify for empanelment.

## Scheme of Exam for Recruitment of Post Graduate Teacher through LDCE:

The written test is of 180 marks (180 objective type multiple choice questions) carrying 01 mark for each question. The duration of written test will be 180 minutes.

### Section Name -Nature of Questions

#### Part I - General awareness & Reasoning (20 questions)

- (a) General Awareness & Current Affairs (10 questions)
- (b) Reasoning Ability (10 questions)

#### Part-II: Perspectives on Education and Leadership (40 questions)

- (a) Understanding the Learner-(10 questions)
  - (b) Understanding Teaching Learning -(10 questions)
  - (c) Creating Conducive Learning Environment
  - (d) School Organization and Leadership
  - (e) Perspectives in Education
- } (20 questions)

#### Part III - Subject-specific Syllabus (120 questions)

- No Interview

#### Note:

- Minimum 40% marks would qualify for empanelment.

## Syllabus of Exam for Recruitment of Post Graduate Teacher through LDCE:

### Part I - General awareness & Reasoning Ability (20 marks)

- (a) General Awareness & Current Affairs
- (b) Reasoning Ability

### Part II -Perspectives on Education and Leadership (40 marks)

#### (a)Understanding the Learner

- Concept of growth, maturation and development, principles and debates of development, development tasks and challenges
- Domains of Development: Physical, Cognitive, Socio-emotional, Moral etc., deviations in development and its implications.
- Understanding Adolescence: Needs, challenges and implications for designing institutional support.
- Role of Primary and Secondary Socialization agencies. Ensuring Home school continuity.

#### (b) Understanding Teaching Learning

- Theoretical perspectives on Learning -Behaviorism, Cognitivism and Constructivism with special reference to their implications for:
  - The role of teacher
  - The role of learner
  - Nature of teacher-student relationship
  - Choice of teaching methods
  - Classroom environment

- Understanding of discipline, power etc.
- Factors affecting learning and their implications for:
- Designing classroom instructions,
- Planning student activities and,
- Creating learning spaces in school.
- Planning and Organization of Teaching-Learning
- Concept of Syllabus and Curriculum, Overt and Hidden Curriculum, Principles of curriculum organization
- Competency based Education, Experiential learning, etc.
- Instructional Plans: -Year Plan, Unit Plan, Lesson Plan
- Instructional material and resources
- Information and Communication Technology(ICT) for teaching-learning
- Evaluation: Purpose, types and limitations. Continuous and Comprehensive Evaluation, Characteristics of a good tool.
- Assessment of learning, for learning and as learning: Meaning, purpose and considerations in planning each.
- Enhancing Teaching Learning processes: Classroom Observation and Feedback, Reflections and Dialogues as a means of constructivist teaching

#### **c) Creating Conducive Learning Environment**

- The concepts of Diversity, disability and Inclusion, implications of disability as social construct, types of disabilities-their identification and interventions
- Concept of School Mental Health, addressing the curative, preventive and promotive dimensions of mental health for all students and staff. Provisioning for guidance and counselling.
- Developing School and community as a learning resource.

#### **(d) School Organization and Leadership**

- Leader as reflective practitioner, team builder, initiator, coach and mentor.
- Perspectives on School Leadership: instructional, distributed and transformative
- Vision building, goal setting and creating a School development Plan
- Using School Processes and forums for strengthening teaching learning-Annual Calendar, time-tabling, parent teacher forums, school assembly, teacher development forums , using achievement data for improving teaching –learning, School Self Assessment and Improvement
- Creating partnerships with community , industry and other neighbouring schools and Higher Education Institutes – forming learning communities

#### **(e) Perspectives in Education**

- Role of school in achieving aims of education.
- NEP-2020: Curriculum and Pedagogy in Schools: Holistic & Integrated Learning; Equitable and Inclusive Education: Learning for All; Competency based learning and Education.
- Guiding Principles for Child Rights, Protecting and provisioning for rights of children to safe and secure school environment, Right of Children to free and Compulsory Education Act, 2009,
- Historically studying the National Policies in education with special reference to school education;
- School Curriculum Principles: Perspective, Learning and Knowledge, Curricular Areas, School Stages, Pedagogy and Assessment

**Part III - Subject-specific Syllabus – Refer Annexure**

**(120 Marks)**

**Note:** Minimum 40% marks would qualify for empanelment.

## **Syllabus for PGT (Biology)**

### **Diversity of living world**

Taxonomic aids, keys, specimen management ; Systematic and binomial system of nomenclature; Classification of living organisms( five kingdom classification, major groups and principles of classification within each group) ;General description of monera, protozoa, fungi,algae, bryophytes, pteridophytes, gymnosperms, angiosperms ( major groups of angiosperms upto sub class) ; Botanical gardens ,herbaria, zoological parks and museums .Salient features of animal ( nonchordates up to phylum level and chordates up to class level).

### **Structural organisation in plants and animals**

Morphology, Anatomy and histology of angiosperms: Root , stem , leaf, flower , inflorescence, fruits and seeds, Tissues : Meristamatic and permanent ( epidermal, ground, vascular). Cambial activity, secondary growth, type of wood. Animal tissues ; Morphology, Anatomy and histology of annelids , insects , amphibians.

### **Structural and functional organization of cell**

Cell cycle , detailed study of Cell division (mitosis , meiosis) ; Cell death ; Structure and function( metabolism) of carbohydrates, proteins, lipids and nucleic acids ; Enzymology : Classification and nomenclature of enzymes ; Structure ; Mechanism of action, single substrate and bisubstrate enzyme ; Activators and inhibitors of enzymes ; Factors affecting the activity of enzymes.

### **Plant physiology**

Water relations: Properties of water, water in tissues and cells, Transport of water and solutes( food, nutrients, gases) : Transport across cell membrane ; soil-plant-atmosphere continuum ; Minerals required by plant, their absorbable form, functions, deficiency symptoms, essentiality of mineral, N<sub>2</sub> metabolism, biological fixation ; Cellular Metabolism: Gluconeogenesis, Glycogenesis and glycogenolysis, hormonal regulation ; Oxidation of food, respiratory efficiency of various food components ; transport and detoxification of ammonia , Lipid Metabolism ; Photosynthesis: Basic principles of light absorption, excitation energy transfer, electron transports, cycles ( C<sub>2</sub> , C<sub>3</sub>, C<sub>4</sub>, CAM ), plant productivity, measurement of photosynthetic parameters ; Physiological responses to abiotic stresses ; Sensory photobiology ; Plant growth regulators : Growth ,differentiation / de-differentiation and re-differentiation, development ; Physiological affects and mechanism of action of plant growth hormones, Flowering : Photoperiodism and its significance, endogenous clock and its regulation, floral induction and development, vernalisation ; Plant movements.

### **Human biology**

Morphology, Anatomy, Histology, Physiology, Control and Disorders of Digestion, Respiration, Body fluids and Circulation, Excretion, Skeleton system & muscle, Nervous; Physiology of high altitude.

## Sexual Reproduction

Plants: Structural details of angiospermic flower, development of gametophytes, pollination and its types, agencies of pollination, pollen- pistil interaction, fertilization, Artificial hybridization (emasculation and bagging) development of seed and fruit ; Apomixis and Polyembryony ; Self incompatibility: Structural and biochemical aspects; methods to overcome incompatibility; Experimental Embryology; Human Reproduction: Morphology, Anatomy, Histology and Physiology of reproduction ; Neuro-endocrine control ; Sexual behavior in infancy, pre-adolescence, adolescence and of adult ; Implantation, Pregnancy and Parturition ; Mammary gland and Lactation ; Infantile mammary gland, pubertal changes in mammary gland; Structure of adult mammary gland, galactopoiesis, milk let down ; Menopause. Senescence – Impact of age on reproduction. Foetal and Embryonic Gonads and Genital ducts ;Hormonal basis of sex differentiation ; Disorders of sexual differentiation development ;Reproductive Health: Problems and strategies, Population explosion –causes and effects, birth control measures- natural methods, physical / barrier, bio-chemical, hormonal, immunological, surgical methods, IUD's , amniocentesis, female feticide, MMR, IMR, MTP, STD's, infertility Disorders of female and female reproductive systems – Sexual dysfunction; Infertility – Causes and curative measures ; Reproductive toxicology of environmental and industrial chemicals, drug and alcohol ;Medically assisted human reproductive technologies, GIFT, IUT, ZIFT, TET ; Embryo culture.

## Genetics

Principles of Inheritance and Variation: Mendelian genetics, Inheritance of one gene, two genes, post mendelian inheritance; Recombination frequency, chromosomal theory of inheritance ; Drosophila genetics, linkage and recombinations ; Mutation :General properties of mutations ; Adaptation versus mutation ; molecular basis of gene mutation : DNA repair mechanisms ; Pedigree analysis ; Human karyotype-banding ; genetic and environmental basis of sex determination, Y- and X-linked genes; Numerical and Structural abnormalities of human chromosomes and related syndromes ; Human metabolic disorders.;Molecular Basis of Inheritance: Chemical nature of DNA and RNA, Biological functions of nucleic acids ; Search for genetic material, RNA world ; Replication ; Transcription and processing of RNA, Genetic code ; Translation, post-translational modifications ; Ribosomes and Proteins ; Regulation of Gene expression ; DNA Fingerprinting ; Gene mapping ; Chromosome banding; Restriction enzyme, nucleotide sequence comparisons and homologies ; Molecular clocks ; Genetics in modern agriculture ,animal breeding, medicine, human behaviour ; Misuse of genetics ; Genetic Counseling ; Gene therapy ; HGP ; Gene Activity in prokaryotes and eukaryotes ; Signals for gene control – Hormones and growth factors ; Totipotency & Pluripotency ; Stem cell and Gene therapy ; Bacterial transformation, transduction and conjugation, Bacterial chromosome ; Bacteriophages : Types, structure and morphology ;Evolutionary biology: Cosmic evolution –Physical basis of life ; Theories of origin of life ; Origin of life through biochemical evolution ; Experimental evidences for origin of life ; The origin of natural selection ; Extraterrestrial life ; Evolution of the eukaryotic cell : Evolution of the Metazoa ; Evolution of chordata and the evolution of the major vertebrate classes; Origin and evolution of man : Population Genetics; Genetic variations ; Polymorphism ; Gene frequency; Hardy Weinberg equilibrium ; Genetic drift, founder effect ; adaptive radiations, ecological significance of molecular variations.

## **Biology in Human welfare**

Health and disease ; types of diseases, common diseases in humans ; Immunology – Innate and Acquired immunity ; Passive and active immunization ; Organization and structure of lymphoid organ ; Cells of the immune system and their differentiation ; Lymphocyte traffic ; Nature of immune response ; Structure and Functions of antibodies : Antigen-Antibody interactions ; Humoral immune response ; Cell mediated immunity ; Immunological memory ; Auto-immunity ; Allergies; HLA system in human :MHC haplotypes ; Transplantation types and problems ; Immunodeficiency disorders ;etiology of HIV ; types, genetics and biochemistry of cancer ; Drugs and alcohol abuse, Addiction , drug dependence, ill effects, prevention, its abuse in adolescents and its management;Strategies for food production and enhancement: Animal husbandry, management of farm animals, breeding strategies ( natural and artificial) and their types, economic importance of each ; Plant breeding, method of release of new variety, HYV of common cereals and pulses, bio-fortification, SCP ; Tissue culturing, somatic hybridization;Microbes in Human Welfare: Technology associated and use of Microbes in household, industries, medicine, bio-active molecules, sewage treatment and STP, Ganga and Yamuna action plan, biogas production, biocontrol agents, biofertilizers.

## **Principles of Biotechnology**

Genetic engineering tools and technique, technique of separation and isolation of DNA, cloning vectors ,electrophoresis, bio reactors, processing of its products. Tissue engineering ; Cryopreservation ; Fusion methods, detection and applications of monoclonal antibodies, DNA vaccines, Edible vaccines.;Application in agriculture : GMO for pest resistance, RNAi and dsRNA technology,Application in Medicine, genetically engineered products, gene therapy.

Molecular diagnosis : serum and urine analysis, PCR, ELISA ; Transgenic animals : their physiology, biological products and their use for testing the safety of vaccine and chemicals ; Bioethics issues ; biopyracy.

## **Ecology**

Organism and its environment, distribution of biomes, major physical factors and the physiological responses shown by organisms ; Physical adaptation of plants and animals, rules governing adaptations ; Population attributes and growth, logistic curves, Darwinian fitness ; Population interactions and their theories ; Ecosystem structure and functions, ecosystem productivity and standing crop, decomposition in nature, energy flow in GFC / DFC, ecological pyramids, succession of community ; Nutrient cycle ; ecosystem services ; Biodiversity types and its patterns, importance of diversity, its loss and their causes, conservation strategies ; Environmental issues : Types of pollution, their indicators, causes, effects, prevention and treatment ; Deforestation, recommended forestation, reforestation, case studies of people's participation in conservation.

## **Syllabus for PGT (Mathematics)**

### **Sets:**

Sets and their representations. Empty set. Finite & Infinite sets. Equal sets. Subsets. Subsets of the set of real numbers. Power set. Universal set. Venn diagrams. Union and Intersection of sets. Difference of sets. Complement of a set.

### **Relations & Functions:**

Ordered pairs, Cartesian product of sets. Number of elements in the cartesian product of two finite sets. Cartesian product of the reals with itself (upto  $\mathbb{R} \times \mathbb{R} \times \mathbb{R}$ ). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation a function, domain, co-domain & range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions. Sets and their Representations. Union, intersection and complements of sets, and their algebraic properties, Relations, equivalence relations, mappings, one-one, into and onto mappings, composition of mappings.

### **Principle of Mathematical Induction:**

Processes of the proof by induction. The principle of mathematical induction.

### **Permutations & Combinations:**

Fundamental principle of counting. Factorial  $n$ . Permutations and combinations, derivation of formulae and their connections, simple applications.

### **Complex Numbers:**

Complex numbers, Algebraic properties of complex numbers, Argand plane and polar representation of complex numbers, Statement of Fundamental Theorem of Algebra, solution of

quadratic equations in the complex number system. Modulus and Argument of a complex number, square root of a complex number. Cube roots of unity, triangle inequality.

### **Linear Inequalities:**

Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Solution of system of linear inequalities in two variables- graphically. Absolute value, Inequality of means, Cauchy-Schwarz Inequality, Tchebychef's Inequality.

### **Binomial Theorem:**

Statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, general and middle term in binomial expansion, simple applications. Binomial Theorem for any index. Properties of Binomial Co-efficients. Simple applications for approximations.

### **Sequence and Series:**

Sequence and Series. Arithmetic, Geometric and Harmonic progressions (G.P.), General terms and sum to  $n$  terms of A.P., G.P. and H.P. Arithmetic Mean (A.M.), Geometric Mean (G.M.), and Harmonic Mean (H.M.), Relation between A.M., G.M. and H.M. Insertion of Arithmetic, Geometric and Harmonic means between two given numbers. Special series, Sum to  $n$  terms of the special series. Arithmetic, Geometric Series, Exponential and Logarithmic series.

### **Elementary Number Theory:**

Peano's Axioms, Principle of Induction; First Principle, Second Principle, Third Principle, Basis Representation Theorem, Greatest Integer Function Test of Divisibility, Euclid's algorithm, The Unique Factorisation Theorem, Congruence, Sum of divisors of a number. Euler's totient function, Theorems of Fermat and Wilson.

### **Quadratic Equations:**

Quadratic equations in real and complex number system and their solutions. Relation between roots and co-efficients, nature of roots, formation of quadratic equations with given roots; Symmetric functions of roots, equations reducible to quadratic equations – application to practical problems.

Polynomial functions, Remainder & Factor Theorems and their converse, Relation between roots and coefficients, Symmetric functions of the roots of an equation. Common roots.

### **Matrices and Determinants:**

Determinants and matrices of order two and three, properties of determinants, Evaluation of determinants. Area of triangles using determinants, Addition and multiplication of matrices, adjoint and inverse of matrix. Test of consistency and solution of simultaneous linear equations using determinants and matrices.

### **Two dimensional Geometry:**

Cartesian system of rectangular co-ordinates in a plane, distance formula, section formula, area of a triangle, condition for the collinearity of three points, centroid and in-centre of a triangle, locus and its equation, translation of axes, slope of a line, parallel and perpendicular lines, intercepts of a line on the coordinate axes.

Various forms of equations of a line, intersection of lines, angles between two lines, conditions for concurrence of three lines, distance of a point from a line, Equations of internal and external bisectors of angles between two lines, coordinates of centroid, orthocentre and circumcentre of a triangle, equation of family of lines passing through the point of intersection of two lines, homogeneous equation of second degree in  $x$  and  $y$ , angle between pair of lines through the origin, combined equation of the bisectors of the angles between a pair of lines, condition for the general second degree equation to represent a pair of lines, point of intersection and angle between two lines.

Standard form of equation of a circle, general form of the equation of a circle, its radius and centre, equation of a circle in the parametric form, equation of a circle when the end points of a diameter are given, points of intersection of a line and a circle with the centre at the origin and condition for a line to be tangent to the circle, length of the tangent, equation of the tangent, equation of a family of circles through the intersection of two circles, condition for two intersecting circles to be orthogonal.

Sections of cones, equations of conic sections (parabola, ellipse and hyperbola) in standard forms, condition for  $y = mx + c$  to be a tangent and point(s) of tangency.

### **Trigonometric Functions:**

Positive and negative angles. Measuring angles in radians & in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle.

Graphs of trigonometric functions. Expressing  $\sin(x+y)$  and  $\cos(x+y)$  in terms of  $\sin x$ ,  $\sin y$ ,  $\cos x$  &  $\cos y$ . Identities related to  $\sin 2x$ ,  $\cos 2x$ ,  $\tan 2x$ ,  $\sin 3x$ ,  $\cos 3x$  and  $\tan 3x$ . Solution of trigonometric equations, Proofs and simple applications of sine and cosine formulae. Solution of triangles. Heights and Distances.

### **Inverse Trigonometric Functions:**

Definition, range, domain, principal value branches. Graphs of inverse trigonometric functions. Elementary properties of inverse trigonometric functions.

### **Differential Calculus:**

Polynomials, rational, trigonometric, logarithmic and exponential functions, Inverse functions. Graphs of simple functions. Limits, Continuity and differentiability; Derivative, Geometrical interpretation of the derivative, Derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions, Derivative of composite functions; chain rule, derivatives of inverse trigonometric functions, derivative of implicit function. Exponential and

logarithmic functions and their derivatives. Logarithmic differentiation. Derivative of functions expressed in parametric forms. Second order derivatives. Rolle's and Lagrange's Mean Value Theorems and their geometric interpretations.

### **Applications of Derivatives:**

Applications of derivatives: rate of change, increasing / decreasing functions, tangents & normals, approximation, maxima and minima.

### **Integral Calculus:**

Integral as an anti-derivative. Fundamental integrals involving algebraic, trigonometric, exponential and logarithmic functions. Integration by substitution, by parts and by partial fractions. Integration using trigonometric identities. Definite integrals as a limit of a sum, Fundamental Theorem of Calculus. Basic Properties of definite integrals and evaluation of definite integrals; Applications of definite integrals in finding the area under simple curves, especially lines, areas of circles / Parabolas / ellipses, area between the two curves.

### **Differential Equations:**

Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables, homogeneous differential equations of first order and first degree. Solutions of linear differential equation.

### **Vectors:**

Vectors and scalars, magnitude and direction of a vector. Direction cosines / ratios of vectors. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Scalar (dot) product of vectors, projection of a vector on a line. Vector (cross) product of vectors.

**Three dimensional Geometry:**

Coordinates of a point in space, distance between two points; Section formula, Direction cosines / ratios of a line joining two points. Cartesian and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Angle between (i) two lines, (ii) two planes. (iii) a line and a plane. Distance of a point from a plane. Scalar and vector triple product. Application of vectors to plane geometry. Equation of a sphere, its centre and radius. Diameter form of the equation of a sphere.

**Statistics:**

Calculation of Mean, median and mode of grouped and ungrouped data. Measures of dispersion; mean deviation, variance and standard deviation of ungrouped / grouped data. Analysis of frequency distributions with equal means but different variances.

**Probability:**

Random experiments: outcomes, sample spaces. Events: occurrence of events, exhaustive events, mutually exclusive events, Probability of an event, probability of 'not', 'and' & 'or' events., Multiplication theorem on probability. Conditional probability, independent events,,

Baye's theorem, Random variable and its probability distribution, Binomial and Poisson distributions and their properties.

**Linear Algebra**

Examples of vector spaces, vector spaces and subspace, independence in vector spaces, existence of a Basis, the row and column spaces of a matrix, sum and intersection of subspaces. Linear Transformations and Matrices, Kernel, Image, and Isomorphism, change of bases, Similarity, Rank and Nullity. Inner Product spaces, orthonormal sets and the Gram- Schmidt Process, the Method of Least Squares. Basic theory of Eigenvectors and Eigenvalues, algebraic and geometric multiplicity of eigen value, diagonalization of matrices, application to system of linear differential equations. Generalized Inverses of matrices, Moore-Penrose generalized inverse. Real quadratic forms, reduction and classification of quadratic forms, index and signature, triangular

reduction of a pair of forms, singular value decomposition, extrema of quadratic forms. Jordan canonical form, vector and matrix decomposition.

### **Analysis**

Monotone functions and functions of bounded variation. Real valued functions, continuous functions, Absolute continuity of functions, standard properties. Uniform continuity, sequence of functions, uniform convergence, power series and radius of convergence. Riemann-Stieltjes integration, standard properties, multiple integrals and their evaluation by repeated integration, change of variable in multiple integration. Uniform convergence in improper integrals, differentiation under the sign of integral - Leibnitz rule.

Dirichlet integral, Liouville's extension. Introduction to n-dimensional Euclidean space, open and closed intervals (rectangles), compact sets, Bolzano-Weierstrass theorem, Heine-Borel theorem. Maxima-minima of functions of several variables, constrained maxima-minima of functions. Analytic function, Cauchy-Riemann equations, singularities, Statement of Cauchy theorem and of Cauchy integral formula with applications, Residue and contour integration. Fourier and Laplace transforms, Mellin's inversion theorem.

## Syllabus for written examination for PGT (Phy)

### **Unit I: Physical World and Measurement**

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. dimensional analysis and its applications.

### **Unit II: Kinematics**

Frame of reference. Motion in a one, two and three dimension: Position-time graph, speed and velocity. Uniform and non-uniform motion, average speed and instantaneous velocity. Uniformly accelerated motion, velocity-time, position-time graphs, relations for uniformly accelerated motion

Vectors :

Position and displacement vectors addition and subtraction of vectors. Relative velocity. scalar product of vectors, Vector product of vectors. Unit vector; Resolution of a vector in a plane - rectangular components. Motion in a plane. Cases of uniform velocity and uniform acceleration-projectile motion.

### **Unit III: Laws of Motion**

Intuitive concept of force. Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces. Types of friction, laws of friction, Dynamics of uniform circular motion .

### **Unit IV: Work, Energy and Power**

Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: elastic and inelastic collisions in one and two dimensions.

### **Unit V: Motion of System of Particles and Rigid Body**

Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of uniform rod.; moment of a force, torque, angular momentum, conservation of angular momentum with some examples. Dynamics of rigid bodies, comparison of linear and rotational motions; moment of inertia, radius of gyration. Values of moments of inertia for geometrical objects. Parallel and perpendicular axis theorems and their applications.

### **Unit VI: Gravitation**

Kepler's laws of planetary motion. The universal law of gravitation. Variation of Acceleration due to gravity and with altitude, latitude and depth. Gravitational potential energy; gravitational potential. Escape velocity. Orbital velocity of a satellite. Geo-stationary satellites.

### **Unit VII: Properties of Bulk Matter**

Elastic behaviour, Stress-strain relationship, Hooke's law, modulus of elasticity. Pressure due to a fluid column; Pascal's law and its applications, Viscosity, Stokes' law, terminal velocity, Reynold's number, streamline and turbulent flow. Bernoulli's theorem and its applications. Surface energy and surface tension, application of surface tension ideas to drops, bubbles and capillary rise. Heat, temperature, thermal expansion; specific heat - calorimetry; change of state - latent heat. Heat transfer-conduction, convection and radiation, thermal conductivity, Newton's law of cooling.

### **Unit VIII: Thermodynamics**

Thermal equilibrium and definition of temperature (zeroth law of thermodynamics). Heat, work and internal energy. First law of thermodynamics. Second law of thermodynamics: reversible and irreversible processes. Heat engines and refrigerators, Carnot cycle and Carnot's theorem. Equation of state of a perfect gas, work done on compressing a gas.

Kinetic theory of gases, degrees of freedom, law of equipartition of energy and application to specific heats of gases; concept of mean free path, Avogadro's number.

### **Unit IX: Oscillations and Waves**

Periodic motion - period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a spring-restoring force and force constant; energy in S.H.M.-kinetic and potential energies; simple pendulum-derivation of expression for its time period; free, forced and damped oscillations, resonance. Wave motion. Longitudinal and transverse waves, speed of wave motion. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect.

### **Unit X: Electrostatics**

Electric Charges; Conservation of charge, Coulomb's law and its application, force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution. Electric field, electric field due to a point charge, electric field lines; electric dipole, electric field due to a dipole; torque on a dipole in uniform electric field. Gauss's theorem and its applications. Electric potential, potential difference, electric potential due to a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor. Van de Graaff generator.

### **Unit XI: Current Electricity**

Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, electrical resistance, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity. Carbon resistors, colour code for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance. Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel. Kirchhoff's laws and its applications.. Potentiometer - principle and its applications. Thermal and chemical effect of current.

### **Unit XII: Magnetic Effects of Current and Magnetism**

Biot - Savart law and its application. Ampere's law and its applications to infinitely long straight wire, straight and toroidal solenoids.

Lorentz's force. Cyclotron, synchrotron. Interaction of a current-carrying conductor with magnetic field. Force between two parallel current-carrying conductors. Torque experienced by a current loop in uniform magnetic field and its application; Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron. Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis. Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements. Para-, dia- and ferro - magnetic substances, with examples. Electromagnets and factors affecting their strengths. Permanent magnets.

**Unit XIII: Electromagnetic Induction and Alternating Currents** Electromagnetic induction; Faraday's law, induced emf and current; Lenz's Law, Eddy currents. Self and mutual inductance. Need for displacement current. Alternating currents and its measurement reactance and impedance; LC oscillations, LCR series circuit, resonance; power in AC circuits, generator, motors and transformer.

#### **Unit XIV: Optics**

Reflection of light, spherical mirrors, mirror formula. Refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lens-maker's formula. Magnification, power of a lens, combination of thin lenses in contact. Refraction and dispersion of light through a prism. Scattering of light and its application. Optical instruments: Human eye-eye defects and its correction. Microscopes and astronomical telescopes and their magnifying powers.

Wave optics: wave front and Huygens' principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygens' principle. Interference, Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light. Diffraction due to a single slit, width of central maximum. Resolving power of microscopes and astronomical telescopes. Polarisation -plane polarised light; Brewster's law, uses of plane polarised light and Polaroids.

#### **Unit XV: Modern Physics**

Dual nature of radiation. Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light. Compton effect, diffraction of X-rays, Bragg's law, Hall effect.

Matter waves-wave nature of particles, de Broglie relation. Davisson-Germer experiment. Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.

Composition and size of nucleus, packing fraction and magnetic moment, atomic masses, isotopes, isobars; isotones. Radioactivity-alpha, beta and gamma particles/rays and their properties; radioactive decay law.

Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; liquid drop model of nucleus, nuclear fission and fusion, critical mass, chain reaction and fission reaction, ionization chamber, Geiger counter and scintillation counter, linear accelerator. (common emitter configuration) and oscillator. Logic gates and its combination. Transistor as a switch.

**Syllabus for written examination for PGT(CHEMISTRY)**

S.No.	Topic (Details of the syllabus)
1.	<b>Some Basic concepts of Chemistry:</b> Scope of chemistry- Historical approach to nature of matter - states of matter, properties of matter and its measurement, S. I system of units, Uncertainty in measurements, dimensional analysis, Laws of chemical combination, atomic and molecular masses, Mole concept and molar masses, percentage composition, empirical and molecular masses, equivalent weight, concept of limiting reagent
2	<b>States of Matter:</b> Gases, liquids and solids, three states of matter, types of intermolecular forces. The laws governing ideal gas behaviour, Dalton's law of partial pressure, Kinetic molecular theory of ideal gases, Maxwell Boltzmann distribution law on molecular motion, real gases – deviation from ideal behaviour, vander Waals equation. <i>Liquid</i> and their properties. <i>Solids:</i> Classification of solids, fundamental types of lattices, two and three dimensional lattice types, Simple crystal structures, Transformation of crystal structure on varying temperature, Bragg's law, density in solids, energy band, band gaps, semiconductors, magnetic and dielectric properties, stoichiometric and non-stoichiometric defects in solids.
3	<b>Structure of Atom:</b> <i>Structure of Atom (Classical Theory)</i> , Dalton's atomic theory, Bohr's model of atom, <i>Structure of atom (modern theory)</i> , de Broglie's relationship, Heisenberg's uncertainty principle, Classical wave equation, Schrödinger's wave equation, Probability distribution curve, Quantum numbers, Pauli's exclusion principle, Aufbau principle, Hund's rule of maximum multiplicity.
4	<b>Equilibrium:</b> Reversible reactions, criteria of equilibrium, Law of mass action, equilibrium constant, $K_c$ and $K_p$ , Le Chatelier principle, Ionic equilibrium, Ostwald's dilution Law, solution of acids, bases, ionic equilibria in solution, Common ion effect – its application to qualitative analysis, acids and bases, Bronsted-Lowry theory of acids and bases, Lewis concept of acid and bases, relative strengths of acids and bases, their quantitative estimation, buffer solution and its use, determination of pH, theories of indicators, conductometric titration, Solubility product, hydrolysis.

5.	<b>Surface Chemistry:</b> Adsorption, absorption, sorption, Physical adsorption, Chemisorption adsorption, isotherms ( Freundlich, Langmuir), application of adsorption, types of Catalysis theories of catalysis, classification of colloids, preparation of Colloidal Solution (lyophobic and lyophilic), Special characteristics of colloidal solutions , electrophoresis, Precipitation of colloids – Hardy Schulze law, multimolecular and macromolecular colloids, Emulsion and Gels.
6	<b>Chemical Kinetics:</b> Theories of reaction rates, rate of reaction , molecularity and order of reaction, Fast reactions- Luminescence and energy transfer process, reaction mechanisms(Simple and complex reactions).
7	<b>Redox Reaction and Electrochemistry:</b> Oxidation and reduction, redox reaction and its application, oxidation number, Strong and weak electrolytes, activity coefficient, conductance and conductivity, Kohlrausch law, resistance and resistivity molar conductivity, equivalent conductivity, Qualitative and quantitative aspect of electrolysis, electrochemical cell and electrolytic cell, Electrode and electrode potential and standard electrode potential, Electrochemical series and its applications, Nernst equation and its application, Equilibrium constant and EMF of the cell.
8	<b>Solutions:</b> Solution and its types, expression of concentration of solution, solubility and factors affecting the solubility of a solid in a liquid (temperature and pressure), Vapour pressure of a liquid, Raoult's law for both volatile and non volatile solute, Ideal and non ideal solution, Colligative properties, abnormal molecular masses and Van't Hoff factor.
9	<b>Chemical bonding and Molecular Structure:</b> Valence electrons and Lewis structures, Ionic bond, Covalent bond, Bond parameters , Co-ordinate bond, polarity and dipole moment, Quantitative idea of – valence bond theory, molecular orbital theory (LCAO), Concept of hybridization involving s, p, d orbitals, Hydrogen bond, Resonance.
10.	<b>Thermodynamics:</b> Macroscopic properties of the system, modes of transfer of energy between system and surrounding, Phase transition, phase rule and phase diagram, First Law, second law and third law, of thermodynamics. Internal energy and enthalpy of the reaction, their measurement and application, spontaneity of process, Entropy and spontaneity, Helmholtz and Gibb's free energy, Thermodynamics of electrochemical cells.

11.	<p><b>Classification of elements and periodicity in properties:</b> Significance of classification, brief history of the development of periodic table, periodic laws, name of the elements with <math>Z &gt; 100</math> according to IUPAC system, classification of elements into s, p, d, f – block elements and their characteristics, Periodic trends in the properties of elements – Ionization enthalpy, Electron gain enthalpy, electronegativity, atomic radii, ionic radii, periodicity of valency or oxidation state.</p>
12.	<p><b>Hydrogen:</b> Position of Hydrogen in periodic table, occurrence, isotopes, Preparation of hydrogen, on small and commercial scale, hydrides, water, hard and soft water, heavy water, hydrogen peroxide, hydrogen economy, hydrogen as a fuel.</p>
13.	<p><b>General principles and processes of isolation of elements and s – block elements:</b> Principles and methods of extraction, oxidation and reduction as applied to the extraction procedures of Al, Cu, Zn and Fe. s – block elements, general introduction – Electronic configuration, occurrence, Anomalous properties of the first element of each group, diagonal relationship,</p>
	<p>Trends in variation of the properties, reaction of alkali and alkaline earth metals. Preparation and properties and uses of some important compounds: - sodium carbonate, sodium bicarbonate, sodium chloride, sodium hydroxide, calcium hydroxide and calcium carbonate, industrial uses of lime and lime stone, biological importance of sodium, potassium, magnesium and calcium.</p>
14.	<p><b>p – Block Elements:</b> Electronic configuration, variation in physical and chemical properties of groups 13 to 18, physical and chemical properties of borax, boric acid, boron hydride, silicones, preparation and uses, preparation, properties and uses of nitrogen, ammonia, nitric acid and oxides of nitrogen, phosphorus – allotropic forms, preparation and properties of phosphine, phosphorus pentachloride and phosphorus trichloride, preparation, properties and uses of oxygen and ozone, hydrides and halides of 16 group elements, their structure and nature, allotropic forms of sulphur- their preparation, preparation, properties and uses of sulphur dioxide, industrial preparation of oxo-acids of sulphur, preparation and properties of halogen and halogen acids, inter halogen compounds, pseudohalide ions. Oxo-acids of halogens, their structure and nature, preparation, properties and uses of xenon fluorides, oxides of xenon and xenon oxo fluorides.</p>

15.	<p><b>The d – and f- Block Elements:</b> General introduction, electronic configuration and general trend in the properties of first row transition metals like metallic character, ionization enthalpy, oxidation states, ionic radii, coloured ion formation, catalytic properties, magnetic properties, oxides, halides and sulphides of first row transition metals, complex compound formation etc. Preparation, properties and structures of <math>\text{KMnO}_4</math> and <math>\text{K}_2\text{Cr}_2\text{O}_7</math>, lanthanoids and actinoids.</p>
16.	<p><b>Co-ordination Compounds and organometallics:</b> Meaning of co-ordination compounds, Werner's theory, ligands – their types, IUPAC nomenclature of co-ordination compounds, isomerism, bonding in co-ordination compounds, colour, magnetic properties and, stabilities of co-ordination compounds. Chemical and biological importance of co-ordination compounds, metal carbonyls: preparation, properties and bonding, organometallic compounds and their classification.</p>
17.	<p><b>Organic Chemistry : Some Basic Principles and Techniques:</b> General Classification of organic compounds, Shapes of organic compounds-Hybridisation(<math>sp</math>, <math>sp^2</math>, <math>sp^3</math>), Structural representation of organic molecules, Functional groups, Homologous, series. Common or trivial names, nomenclature of aliphatic, aromatic and substituted aromatic compounds.</p> <p><b>Isomerism :</b> Structural and Stereo isomerism <b>Fundamental Concepts in Reaction Mechanism:</b> Cleavage of covalent bond, Types of attacking species, electron movement in organic reactions, electronic displacement in a covalent bond and types of organic reactions.</p> <p><b>Methods of purification of organic compounds:</b> Qualitative analysis, Quantitative analysis., estimation of the elements and determination of empirical and molecular formula.</p>

18.	<p><b>Hydrocarbons:</b> Classification of hydrocarbons.</p> <p><b>Alkanes:</b> Conformations (Newmann and Sawhorse formulae), Physical properties, Chemical reactions</p> <p><b>Cycloalkanes:</b> Preparation, physical and chemical properties, stability of cycloalkanes (Bayer strain theory), chair and boat forms of cyclohexane.</p> <p><b>Alkenes:</b>, structure of double bond, geometrical isomerism, physical properties, methods of preparation, chemical reactions.</p> <p><b>Alkadienes:</b> Classification of dienes, Preparation of conjugated dienes, Chemical properties (1,2 and 1,4- addition to conjugated dienes).</p> <p><b>Alkynes:</b>, structure of triple bond, physical properties, methods of preparation Chemical properties, Acidic nature of alkynes</p> <p><b>Aromatic Hydrocarbons:</b>, Structure of benzene, resonance, aromaticity (Huckel's rule) Chemical properties, mechanism of electrophilic substitution direct influence of substituents in mono substituted benzene.</p>
19.	<p><b>Environmental Chemistry:</b> Environmental pollution, Atmospheric pollution, Tropospheric pollution (Air pollution), Major air pollutants, Control of air pollution, Smog (Chemical and Photochemical smog), Stratospheric pollution: Ozone layer and its depletion, Acid rain, Green House Effect and Global warming, Water pollution, Soil pollution and Industrial waste.</p>
20.	<p><b>Haloalkanes and Haloarenes:</b> Classification, methods of preparation of haloalkanes and haloarenes, their physical properties, tests to distinguish between alkyl and aryl halides, <b>mechanism of <math>SN^1</math> and <math>SN^2</math> reactions</b>, elimination reactions (<b>Saytzeff Rule, <math>E_1</math> &amp; <math>E_2</math> mechanism</b>). <b>Poly halogen compounds:</b> Preparation and properties.</p>
21.	<p><b>Alcohols, Phenols and Ethers:</b> Classification, preparation, properties and uses, tests to distinguish between primary, secondary and tertiary alcohols. Distinctions between alcohols and phenols. Preparation of ethers, physical and chemical properties.</p>
22.	<p><b>Aldehydes, Ketones and Carboxylic Acids:</b> Structure of carbonyl group, preparation of aldehydes and ketones, physical, Chemical properties and uses, tests to distinguish between aldehydes and ketones. Preparations of carboxylic acids preparation properties and uses.</p>

23.	<b>Amines (Organic compounds containing nitrogen ):</b> Classification, Structure of amino group, preparation, Physical, Chemical properties, tests to distinguish between primary, secondary and tertiary amines
24.	<b>Polymers:</b> Polymerization, Classification of polymers based on : origin, structure, molecular forces, mode of polymerization. <b>Addition polymerization Condensation polymerization(Step-growth polymerization)</b> Preparation of condensation polymers Synthetic and natural rubber and vulcanization, Determination of molecular mass of polymers:. Poly dispersity index(PDI). <b>Bio-degradable polymers like PHBV.</b>
25.	<b>Biomolecules(Biochemistry):Carbohydrates:</b> Classification of carbohydrates , Structural determination of glucose and fructose on the basis of their chemical properties, Open chain (Fischer) structure, cyclic structure( <b>Haworth form</b> ), $\alpha$ and $\beta$ forms of glucose, <b>Mutarotation, anomers and epimers</b> , Chemical reactions of glucose, Reducing and non-reducing sugars, Configuration of glucose and fructose. Disaccharides Sucrose, <b>Haworth representation of disaccharides</b> , Polysaccharides, Starch, Cellulose, and amylopectin structures, Functions of Carbohydrates in living organisms. Carbohydrate metabolism, glycolysis, electron-transport chain, <b>Proteins:</b> Amino acids, Zwitter ion, Iso-electric point, peptides and peptide bond, Fibrous proteins, Globular proteins and their functions, Primary, Secondary(Helix and pleated sheet structures) and tertiary structure of proteins, denaturation and renaturation, Enzymes, specificity and mechanism of enzyme activity , coenzymes, applications of enzymes. <b>Nucleic acids :</b> Nucleosides, Nucleotides, Structure of ATP, Photosynthesis(Light and dark reactions) Primary and Secondary structure of DNA(Double Helix structure) , biological functions of nucleic acids, Replication, Protein synthesis (Transcription, Translation, mutation), genetic code, genetic errors, Vitamins, classification, diseases caused by the deficiency of vitamins, Hormones (steroid hormones and non-steroid hormones) and their functions.

26.	<b>Chemistry in Everyday life: Drugs and medicines</b> - designing a drug, drug metabolism, classification of drugs, enzymes as drug targets, action of drug through drug receptor interaction, types of drugs: Antipyretics, Analgesics, antiseptics, disinfectants, tranquilizers, antimicrobials, antibiotics(Narrow spectrum and broad spectrum antibiotics), antifertility drugs, antihistmmines, antacids. Chemicals in food, Food preservatives, artificial sweetening agents, Soaps and detergents, Preparation soaps(Saponification) and detergents, cleansing action of soaps, advantages of detergents over soaps, Deodorants, Edible colours, antioxidants.
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## SYLLABUS FOR WRITTEN EXAMINATION FOR PGT(COMMERCE)

### PART – I **BUSINESS STUDIES AND MANAGEMENT**

- Introduction to Business– Concepts, characteristics, objectives. Classification of business as industry and commerce. Distinctive features of business - Business, profession and employment. Choice of Form of Organization .Large Scale and Small Scale Business-.Assistance by Government to Small Scale Sector.
- Form of Business Organization – Sole Proprietors, Joint Hindu Family, Partnership, Joint Stock Company and its formation, Cooperative organization.
- Business ownership– Private, public and Joint sector. Public Enterprises, Role- dynamics of Public Sector, Global Enterprises (Multinational Companies), Joint Ventures.
- Business Services – banking, insurance, transportation, warehousing, communication, Impact of Technology on Business Services.
- Trade: Internal Trade Retail and Wholesale trade, Emerging modes of business- franchisee, E-business and Outsourcing. International Business–Export-Import – Procedure and documentation, EPZ/SEZ . International Trade Institutions and Agreements – WTO, UNCTAD, World-Bank, IMF.
- Business Finance: Sources – owners and borrowed fund, Sources of raising finance, Equity and preference Shares, GDR, ADR, Debentures, Bonds – Retained Profit, Public Deposits, Loan from Financial Institutions and commercial banks, Credit-rating and rating agencies, Trade credit, Micro-credit.
- Social Responsibility of Business, Business Ethics, Environment protection.
- Management – concept, objectives, nature of management as Science, Art and Profession, levels, Principles of Management general and scientific.
- Business Environment – meaning, importance, dimensions, changing business environment– special reference to liberalization, privatization and globalization, Business - a Futuristic vision.
- Management Function – Planning, organizing, staffing, directing, controlling and coordination
- Business Finance: Financial Management – meaning, scope, role and objectives, financial planning, Capital structure, leverage, Fixed and working capital – meaning and factors affecting its requirements.
- Financial Market – Money Market-nature, instruments, Capital Market- Primary and secondary, Stock exchange, NSEI, OTCEI, Procedures, SEBI.
- Human Resource Management– meaning , importance, man-power estimation , Recruitment and selection, Training and development , Compensation, Performance Evaluation
- Marketing – meaning, functions and role, Levels of Marketing , Changing facets of marketing , Product-mix, Models of Marketing.
- Organizational Behaviors : Individual behaviors , Motivation–concepts and applications, Personality perception, Learning and attitude, Leadership and its approaches, Communication , Group dynamics.
- Emerging Trends in Management – Business Process Reengineering, Total Quality Management, Quality Circles, Benchmarking, Strategic Management, Knowledge Management, Business Standardization and ISO.
- Consumer Protection – Meaning, importance, consumers’ rights, Consumers’ responsibilities, Consumer awareness and Legal redressal with special reference to consumer Protection Act, Role of consumer organization and NGOs.

## **PART –II**

### **FINANCIAL ACCOUNTING AND FINANCIAL STATEMENT ANALYSIS**

- Accounting: Meaning, objectives, qualitative characteristics of Accounting information, Accounting Principles, Accounting concepts, Accounting standards, Cash and Accrual Basis of Accounting.
- Process of Accounting :Voucher, transaction ,Accounting Equation, Rules of Debit and Credit, Book of original entry-Journal and Special Purpose Books, Ledger ,posting from Journal and subsidiary books, Balancing of Accounts, Trial Balance and Rectification of Errors .Bank Reconciliation Statement.
- Accounting for depreciation , Provisions and Reserves ,Bills of Exchange, Non-Profit Organization , Partnership Firms - Reconstitution of Partnership (Admission ,Retirement ,Death and Dissolution),Account of Incomplete Records, Consignmentand Joint ventures.
- Accounting of Joint stock Companies: Share capital types of shares, accounting for issue, allotment forfeiture and re-issue of shares. Debentures –types, issue and method of redemption Final Accounts of Sole proprietor and Joint Stock Companies. Emerging trends of presentation of Final Accounts. Accounting for liquidation.
- Financial Statement Analysis: Meaning, significance, limitation .Tools for Financial Statement Analysis-comparative statements, common size statements, Trend analysis, accounting ratios.
- Fund Flow Statement and Cash Flow Statement: Meaning, objectives, preparation as per revised standard issued by ICAI.
- Cost Accounting- Nature, functions . Job costing, Process costing, Marginal costing, Cost-volume-profit relationship. Cost control and cost reduction techniques
- Computers In Accounting: Introduction to Computers and Accounting Information System, Application of Computers in Accounting, Automation of Accounting process, designing accounting reports, MIS reporting, data exchange with other information system. Ready made , customized and tailor made Accounting Systems.
- Accounting And Database Management System –meaning, concept of entity and relationship in an accounting system, Data Base Management System(DBMS) inaccounting.
- Inflation accounting and Accounting for Human Resource of an Organization andSocial Responsibility.

## Syllabus for PGT (CS)

### Computer Systems and Organisation

- **Basic Computer Organisation:** Introduction to computer system, hardware, software, input device, output device, CPU, memory (primary, cache and secondary), units of memory (Bit, Byte, KB, MB, GB, TB, PB)
- **Types of software:** system software (operating systems, system utilities, device drivers), programming tools and language translators (assembler, compiler & interpreter), application software
- **Operating system (OS):** functions of operating system, OS user interface
- **Boolean logic:** NOT, AND, OR, NAND, NOR, XOR, truth table, De Morgan's laws and logic circuits
- **Number system:** Binary, Octal, Decimal and Hexadecimal number system; conversion between number systems.
- **Encoding schemes:** ASCII, ISCII and UNICODE (UTF8, UTF32)

### Computational Thinking and Programming

- **Introduction to problem solving:** Steps for problem solving (analysing the problem, developing an algorithm, coding, testing and debugging). representation of algorithms using flow chart and pseudo code, decomposition
- **Familiarization with the basics of Python programming:** Introduction to Python, features of Python, executing a simple "hello world" program, execution modes: interactive mode and script mode, Python character set, Python tokens (keyword, identifier, literal, operator, punctuator), variables, concept of l-value and r-value, use of comments
- **Knowledge of data types:** number (integer, floating point, complex), boolean, sequence (string, list, tuple), none, mapping (dictionary), mutable and immutable data types
- **Operators:** arithmetic operators, relational operators, logical operators, assignment operator, augmented assignment operators, identity operators (is, is not), membership operators (in, not in)
- **Expressions, statement, type conversion & input/output:** precedence of operators, expression, evaluation of expression, python statement, type conversion (explicit & implicit conversion), accepting data as input from the console and displaying output
- **Errors:** syntax errors, logical errors, runtime errors
- **Flow of control:** introduction, use of indentation, sequential flow, conditional and iterative flow control
- **Conditional statements:** if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number
- **Iterative statements:** for loop, range function, while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number etc
- **Strings:** introduction, indexing, string operations (concatenation, repetition, membership & slicing), traversing a string using loops, built-in functions: len(), capitalize(), title(), lower(), upper(), count(), find(), index(), endswith(), startswith(), isalnum(), isalpha(), isdigit(), islower(), isupper(), isspace(), lstrip(), rstrip(), strip(), replace(), join(), partition(), split()
- **Lists:** introduction, indexing, list operations (concatenation, repetition, membership & slicing), traversing a list using loops, built-in functions: len(), list(), append(), extend(), insert(), count(), index(), remove(), pop(), reverse(), sort(), sorted(), min(), max(), sum(); nested lists, suggested programs: finding the maximum, minimum, mean of numeric values stored in a list; linear search on list of numbers and counting the frequency of elements in a list
- **Tuples:** introduction, indexing, tuple operations (concatenation, repetition, membership & slicing), built-in functions: len(), tuple(), count(), index(), sorted(), min(), max(), sum(); tuple assignment, nested tuple, suggested programs: finding the minimum, maximum, mean of values stored in a tuple; linear search on a tuple of numbers, counting the frequency of elements in a tuple
- **Dictionary:** introduction, accessing items in a dictionary using keys, mutability of dictionary (adding a new item, modifying an existing item), traversing a dictionary, built-in functions: len(), dict(), keys(), values(), items(), get(), update(), del, clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), count(), sorted(), copy(); suggested programs : count the number of times a character appears in a given string using a dictionary, create a dictionary with names of employees, their salary and access them
- **Introduction to Python modules:** Importing module using 'import <module>' and using from statement, Importing math module (pi, e, sqrt, ceil, floor, pow, fabs, sin, cos, tan); random

module (random, randint, randrange), statistics module (mean, median, mode) Society, Law and Ethics

- Digital Footprints
- **Digital society and Netizen:** net etiquettes, communication etiquettes, social media etiquettes
- **Data protection:** Intellectual Property Right (copyright, patent, trademark), violation of IPR (plagiarism, copyright infringement, trademark infringement), open source softwares and licensing (Creative Commons, GPL and Apache)
- **Cyber-crime:** definition, hacking, eavesdropping, phishing and fraud emails, ransomware, preventing cyber crime
- **Cyber safety:** safely browsing the web, identity protection, confidentiality, cyber trolls and bullying.
- **Safely accessing web sites:** malware, viruses, trojans, adware
- **E-waste management:** proper disposal of used electronic gadgets
- Indian Information Technology Act (IT Act)
- **Technology & Society:** Gender and disability issues while teaching and using computers

### Computational Thinking and Programming

- **Functions:** types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope)
- Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths
- **Text file:** opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file
- **Binary file:** basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file
- **CSV file:** import csv module, open / close csv file, write into a csv file using csv.writer() and read from a csv file using csv.reader()
- **Data Structure:** Stack, operations on stack (push & pop), implementation of stack using list.

### Computer Networks

- **Evolution of networking:** introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)
- **Data communication terminologies:** concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)
- **Transmission media:** Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)
- **Network devices** (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)
- **Network topologies and Network types:** types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)
- **Network protocol:** HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP
- **Introduction to web services:** WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

### Database Management

- **Database concepts:** introduction to database concepts and its need
- **Relational data model:** relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)
- **Structured Query Language:** introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command,

delete command, aggregate functions (max, min, avg, sum, count), group by, having clause, joins: cartesian product on two tables, equi-join and natural join

- **Interface of python with an SQL database:** connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications

## Introduction to Computer System

**Introduction to computer and computing:** evolution of computing devices, components of a computer system and their interconnections, Input/output devices.

**Computer Memory:** Units of memory, types of memory – primary and secondary, data deletion, its recovery and related security concerns.

**Software:** purpose and types – system and application software, generic and specific purpose software.

## Introduction to Python

**Basics of Python** programming, Python interpreter - interactive and script mode, the structure of a program, indentation, identifiers, keywords, constants, variables, types of operators, precedence of operators, data types, mutable and immutable data types, statements, expressions, evaluation and comments, input and output statements, data type conversion, debugging.

**Control Statements:** if-else, for loop

**Lists:** list operations - creating, initializing, traversing and manipulating lists, list methods and built-in functions.

**Dictionary:** concept of key-value pair, creating, initializing, traversing, updating and deleting elements, dictionary methods and built-in functions.

## Database concepts and the Structured Query Language

**Database Concepts:** Introduction to database concepts and its need, Database Management System.

**Relational data model:** Concept of domain, tuple, relation, candidate key, primary key, alternate key, foreign key

Advantages of using Structured Query Language, Data Definition Language, Data Query Language and Data Manipulation Language, Introduction to MySQL, creating a database using MySQL, Data Types

Data Definition: CREATE TABLE, ALTER, DROP

Data Query: SELECT, FROM, WHERE.

Data Manipulation: INSERT, UPDATE, DELETE

## Introduction to the Emerging Trends

Artificial Intelligence, Machine Learning, Natural Language Processing, Immersive experience (AR, VR), Robotics, Big data and its characteristics, Internet of Things (IoT), Sensors, Smart cities, Cloud Computing and Cloud Services (SaaS, IaaS, PaaS); Grid Computing, Block chain technology.

## Data Handling using Pandas

**Introduction to Python libraries-** Pandas, Matplotlib.

**Data structures in Pandas - Series and Data Frames.**

**Series:** Creation of Series from – ndarray, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing and Slicing.

**Data Frames:** creation - from dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on rows and columns: add, select, delete, rename; Head and Tail functions; Indexing using Labels, Boolean Indexing; Importing/Exporting Data between CSV files and Data Frames.

## **Data Visualization**

**Purpose of plotting;** drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram

**Customizing plots:** adding label, title, and legend in plots.

## **Database Query using SQL**

**Math functions:** POWER (), ROUND (), MOD ().

**Text functions:** UCASE (), UPPER (), LCASE (), LOWER (), MID (), SUBSTRING (), SUBSTR (), LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM ().

**Date Functions:** NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME ().

**Aggregate Functions:** MAX (), MIN (), AVG (), SUM (), COUNT ();  
using COUNT (\*).

Querying and manipulating data using Group by, Having, Order by.

## **Introduction to Computer Networks**

Introduction to networks, Types of network: LAN, MAN, WAN.

**Network Devices:** modem, hub, switch, repeater, router, gateway

**Transmission media:** Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)

**Network Topologies:** Star, Bus, Tree, Mesh.

Introduction to Internet, URL, WWW, and its applications- Web, email, Chat, VoIP.

**Website:** Introduction, difference between a website and webpage, static vs dynamic web page, web server and hosting of a website.

**Web Browsers:** Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.

## **Societal Impacts**

Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act.

**E-waste:** hazards and management.

Awareness about health concerns related to the usage of technology.

## Syllabus for written examination for PGT(ECONOMICS)

### PART–A

#### INTRODUCTORY MICRO ECONOMICS AND MACRO

#### ECONOMICS

1. **Introduction:** Central problems of an economy, production possibility curve and opportunity cost.
2. **Consumer Behaviour and Demand:** Consumer's Equilibrium - meaning and attainment of equilibrium through Utility Approach and Indifference Approach, Demand, market demand, determinants of demand, demand curve, movement along and shifts in demand curve. Law of demand and its exceptions. Price elasticity of demand, measurement of price elasticity of demand - percentage, total expenditure and geometric method.
3. **Producer Behaviour & Supply:** Agents of production. Production function. Cost and Revenue-meaning and various types of costs and revenue. Isoquants. Returns to a factor and returns to scale. Supply, market supply, determinants of supply, supply curve, movement along and shifts in supply curve, price elasticity of supply and its measurement. Components and theories of distribution. Welfare economics: Pareto- optimality, private and social products. Consumer surplus.
4. **Forms of Market and Price Determination:** Forms of market – meaning and features. Price determination under perfect competition, monopoly and imperfect competitions, effects of shifts in demand and supply.
5. **National Income and related aggregates:** Macroeconomics: Meaning. Circular flow of income, concepts of GDP, GNP, NDP, NNP (at market price and factor cost), National Disposable Income, Private Income, Personal Income and Personal Disposable Income. Measurement of National Income.
6. **Determination of Income and Employment:** Aggregate demand, Aggregate supply and their components. Propensity to consume and propensity to save. Involuntary unemployment and full employment. Determination of income and employment. Concept of investment multiplier and its working. Problems of excess and deficient demands Measures to correct excess and deficient demands - availability of credit, change in Government spending. Inflation: meaning, causes and remedies
7. **Money and Banking:** Money - meaning, evolution and functions. Central bank - meaning and functions. Commercial banks - meaning and functions. Recent significant reforms and issues in Indian Banking System-privatisation and modernisation
8. **Government Budget and the Economy:** Government budget - meaning and its components. Objectives of government budget. Classification of receipts; classification of expenditure. Types of budget. Revenue deficit, fiscal deficit and primary deficit: meaning and implications; measures to contain different deficits. Downsizing the role of government.
9. **Balance of Payments:** Foreign exchange rate- meaning (Fixed and Flexible), merits and demerits; Determination through demand and supply. Balance of payments accounts - meaning and components

10. **International Economics:** Theories of international trade, free trade and protection, IMF – The World Bank and its associates. WTO.

11. **Concepts of shares, debentures, SEBI, NSEW, BSE and various indices.**

### STATISTICS AND INDIAN ECONOMIC DEVELOPMENT

1. **Introduction and collection, organization of data:** Meaning, scope and importance of statistics in Economics. Collection and organisation of data. Census of India and National Sample Survey Organisation.
2. **Statistical Tools and Interpretation:** Measures of Central Tendency. Geometric mean and harmonic mean. Measures of Dispersion. Lorenz Curve: Meaning and its application. Correlation – meaning. Measures of correlation - Karl Pearson's method, Spearman's rank correlation. Time series analysis. Introduction to Index Numbers - meaning, types - wholesale price index, consumer price index and index of industrial production, uses of index numbers; Inflation and index numbers.
3. **Development Policies and Experience:** A brief introduction of the state of Indian economy on the eve of independence. Common goals of Five Year Plans, major controversies on planning in India. Main features, problems and policies of agriculture, industry and foreign trade.
4. **Economic Reforms since 1991:** Need & main features - liberalisation, globalisation and privatisation; an appraisal of LPG policies
5. **Current challenges facing Indian Economy:** Poverty and programmes for poverty alleviation. Rural development: Key issues - credit and marketing - role of cooperatives; agricultural diversification; alternative farming - organic farming. Human Capital Formation. Growth of Education Sector in India. Employment: opportunities and other related issues. Infrastructural Problems and policies. Sustainable Economic Development: Meaning; Effects of Economic Development on Resources and Environment.
6. **Development Experience of India: A comparison with neighbours** India and Pakistan, India and China, Issues: growth, population, sectoral development and other developmental indicators.

## **SYLLABUS FOR WRITTEN EXAMINATION FOR PGT (ENGLISH)**

### **Section A**

#### **READING COMPREHENSION**

Ability to comprehend, analyze and interpret unseen texts.  
Three/four unseen reading passages may be set.

### **Section B**

#### **WRITING ABILITY**

Ability to express views/opinions in a coherent & logical manner.

B1. One out of two tasks such as factual description of any event or incident, a report or a process.

B2. Writing one formal letter. Letter types include

- a) Business or official letters (for making enquiries, registering complaints, asking for and giving information, placing orders and sending replies)
- b) Letter to the editors (giving facts/figures suggestions / opinions on an issue of public interest) on contemporary / current issues.
- c) Application for a job with cv.

B3. Writing personal opinion / views/stand in an article/debate/speech etc on a given socio-cultural issue – in a style/register suitable to the task set. Issues could relate to

- (a) environment
- (b) education
- (c) gender discrimination
- (d) economic disparity etc..

### **Section C**

#### **GRAMMAR AND USAGE**

Ability to apply the knowledge of syntax and grammatical items & use them accurately in the context provided.

The following grammatical structures will be tested through error correction / editing / gapfilling / sentence completion / multiple choice questions :

1. Determiners
2. Tenses
3. Clauses
4. Modals
5. Voice

## **Section D**

### *LITERATURE*

- ✓ Shakespeare's works.
- ✓ Romantic period (e.g. Shelley, Wordsworth, Keats, Coleridge etc)
- ✓ 19<sup>th</sup> and 20<sup>th</sup> Century American and English Literature (e.g. Robert Frost, Hemmingway, Whitman, Hawthorne, Emily Dickinson , Bernard Shaw, Arthur Milleretc. )
- ✓ Modern Indian Writing in English (e.g. Anita Desai, Vikram Seth, Nissin Ezekiel, K N Daruwala, Ruskin Bond, R K Narayan, Mulk Raj Anand, Khushwant Singh etc)
- ✓ Modern writing in English from other parts of the world e.g. Latin America / Africa / Australia / South Asia.

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## Syllabus for Written Examination for PGT (Geography)

### Topic I: Geography as a discipline-

Geographical ideas in ancient, medieval & modern periods: the contributions of Varenus, Kant, Reine, Humboldt and Ritter. Influence of Richthofen and Darwin. Videl-da-la Blache, F. Ratzel etc.

**Contemporary geography: Post Second World War, Environmentalism, Areal Differentiation, spatial organization, Behavioural and perceptual Geography. Positivism in Geography. Humanistic Geography. Marxist Geography and critical social theory. Development in Indian Geography.**

### Topic-2 Origin and Evolution of the Earth-

Introduction to the solar system,

Motions of Earth: Rotation, Revolution, Occurrence of Day and Night; change of seasons; Latitudes and Longitudes; Finding time.

Earth's Interior: Origin of continents and ocean basins Wegener's Continental drift theory, Theory of Plate Tectonics Earthquakes and Volcanoes, Folding and faulting

Origin of the Earth: Nebular hypothesis (old Theory) and Big-Bang Theory. Evolution of continents, atmosphere and oceans.

### Topic-3 Interior of the Earth and Distribution of oceans and continents-

Constitution of Earth's interior (based on Seismic Evidences), origin of the continents and ocean basins. Wegener's theory of Continental drift and Plate Tectonics. Plate movements and interactions-Volcanism and seismicity.

### Topic-4 Landforms-

Mineral and rocks- classification of rocks, rock cycle. Important minerals geomorphic process of denudation Endogenic and Exogenic processes. Mass Wasting, Landslide, Work of River, Glacier Wind, Sea Waves etc, processes of soil formation.

### Topic-5 Climate:

Atmosphere: Composition and structure. Insolation and temperature, Atmospheric pressure and winds, Atmospheric moisture, cyclones, classification of climate (Koeppen and Thornthwaite Schemes classification). Global climatic changes: Causes and effects.

### Topic-6 Water (Ocean)

Geomorphology of the ocean floor, submarine relief features of Atlantic, Pacific and Indian Ocean.

Movement of ocean water: Currents, tides and waves. Marine deposits and coral reefs.

### Topic -7 Life on the Earth

Approaches in environmental Geography, landscape, ecosystem and perception approaches, Man and the Biosphere: Interactive and dynamic relationship. Human impact on biogeochemical cycles.

### Topic-8 India:

Geographical basis of Indian State-territory; location, extent, shape and size.Topic-9

### Physiography:

Structure, Physiographic divisions, Drainage system and its evolution.Topic-

### 10 Climate, Vegetation and Soil-

Climate: factors controlling climate of India

Origin and mechanism of Indian monsoon; Seasons of India, Classification of climate of India (Koeppen's, Thornthwaite, Triwartha).

Soils: Type and distribution (I.C.A.R.), Soil problems, conservation of soil

Vegetation- Types & Distribution; conservation

Wild Life- its conservation.

### Topic-11 Natural Hazards and disasters-

Causes, Consequences and management in India Environmental Hazards: Floods, droughts, cyclones, earthquakes and landslides; human adjustment to hazards; hazards perception and mitigation; environmental institutions and legislation in India.

### Topic-12 Human Geography: Nature and Scope.

Nature and scope of Human Geography, Approaches to the Human Geography, Determinism, Environmental Determinism, Possibilism, Neo-determinism, ecological and Behaviouralism.

### Topic -13 People (World and India)

Trends and patterns of population growth: determinants and patterns of population distribution; theories, demographic transition; Human migration, Patterns of human development.

### Topic-14 Human Activities: (World and India)

Primary: -Hunting, gathering, Herding (Nomadic & Commercial) Lumbering fishing, mining and agriculture; Agricultural practices; some major crops.

Secondary: - Industries: Classification, Theories of localization, major Industries, recent trends in industries, world comparisons.

Tertiary:- (Services)      Quaternary-  
Quinary activities

Planning in India: target area planning, idea of sustainable development

### **Topic-15 Transport, Communication and Trade(World and India)**

Transport and communication Roads, railways, waterways and airways; oil and gas pipelines, national electric grids. Communication networking-radio, television, satellite and Internet.

International Trade-Basis and components, trade balance, major trading organizations, changing pattern of India's foreign trade, sea-routes, inland water-ways, sea ports and their hinter-land.

### Topic-16 Human settlements (World and India)

Unstable and stable settlements, rural settlements: origin, types and patterns; Urban settlements: Origin and growth of towns; functional classification of towns. Problems of urbanization in the world; urbanization in India; Urban slums and squatters. Morphology of cities; distribution of Mega-cities, problems of human settlements in Developing countries.

### Topic -17 Geographical perspective on selected issues and problems

Environmental pollution-Land, Water, Air, Noise, Global Warning, Poverty, Food Security; Sustainable Development.

### Topic -18 General Cartography (Practicals)

Elements and classification of maps, scales, map-projections, finding directions, latitudes, longitudes and calculation of local & standard time, Identification & Analysis of relief forms: Topographical Maps and interpretation. Weather-instruments and interpretation of weather maps. Digital mapping, Remote sensing, Visual interpretation. Processing of Data, Thematic mapping, representing statistical data by various diagrams-Bar, Histogram, Pie etc.

Spatial Information technology: GIS, GPS, Computers-Software and Hardware components, Data format, Raster and Vector, editing and topology etc. Spatial Analysis; Overlay, Buffer and Proximity analysis.

## SYLLABUS FOR WRITTEN EXAMINATION FOR PGT HISTORY

### INDIAN HISTORY

- Harappan Civilization –
- Town Planning
  - Religion
  - Economic & Social Life
  - Script Writing
- 1) Rise of Magadh in relation to 16 Mahajanpadas**
  - Rise of Heterodox sects with special reference to Buddhism, Jainism –
    - Rise
    - Teaching
    - Comparison
    - Effect on society, trade & commerce
  - The Mauryas –
    - Causes for its rise
    - Chandragupta Maurya Administration
    - Contribution of Ashoka the Great (all aspects)
    - Decline and fall of Mauryan Empire
  - The Guptas –
    - Golden Period
    - Samudra Gupta
    - Chandragupta Vikramaditya etc
    - Administration, Religion, Trade & Commerce
  - Society & Economy – From Vedic till 7<sup>th</sup> century
  - Sultanate Era – The Defeat of Hindu kingdom and establishment of Delhi Sultanate
  - Mughal Period – 1526 to 1707(all aspects)
    - Polity
    - Administration
    - Society
    - Economy
  - Medieval Period – Society and Culture with special Reference to Bhakti Movement and Sufism
  - Medieval Architecture – Delhi Sultanate 'n Mughal Period
  - The Advent of Europeans and the establishment of British rule
  - British rule and its impact on Indian economy
  - Revolt 1857 –
    - Nature
    - Causes
    - Leadership
    - Events
    - Consequences
    - Causes of defeat
    - Impact
  - The socio – religious reform movements and the rise of nationalism
  - The Indian freedom movement - 1885 to 1947
  - Constitution –
    - Framing
    - Features
    - Working of the Constitution
    - Adoption of the Constitution

### HISTORY OF THE WORLD

- 1) Rise of Ancient Civilizations with special reference to Mesopotamia –**
  - Urbanization
  - Script
  - Trade
  - Calendar
- 2) Roman and Greek civilization**
  - Rise of the empire
  - Administration
  - Society
- 3) Rise of Islam –**
  - Teachings
  - Culture
  - Crusades
- 4) Nomadic people of Central Asia**
- 5) The Dark age - Feudalism in Europe**
  - Manor State
  - Decline
- 6) Renaissance 'n Reformation period in Europe**
- 7) Capitalism and Mercantilism**
  - Industrial Revolution
  - Imperialism and colonialism
- 8) China Since 1840 to 1949**
- 9) Japan 1840 to 1949**

## स्नातकोत्तर शिक्षक (हिन्दी) हेतु विषय-विशेष पाठ्यक्रम

पाठ्य पुस्तक - आरोह-भाग 1,  
एन सी ई आर टी, नई दिल्ली द्वारा  
प्रकाशित

### गद्य खंड :

1. प्रेमचंद: नमक का दरोगा
2. कृष्णा सोबती: मियाँ नसीरुद्दीन
3. सत्यजित राय: अपू के साथ ढाई साल
4. बालमुकुंद गुप्त:विदाई-संभाषण
5. शेखर जोशी: गलता लोहा
6. कृष्णनाथ: स्पीति में बारिश
7. मन्नू भंडारी: रजनी
8. कृष्णचंदर: जामुन का पेड़
9. जवाहरलाल नेहरू: भारत माता
10. सैयद हैदर रज़ा: आत्मा का ताप

### काव्य खंड:

- 1.कबीर : 1.हम तौ एक एक करि जानां ।  
2.संतों देखत जग बौराना ।
- 2.मीरा: 1.मेरे तो गिरधर गोपाल, दूसरो न कोई  
2.पग घुँघरू बांधि मीरां नाची
3. रामनरेश त्रिपाठी: पथिक
4. सुमित्रानंदन पंत: वे आँखें
- 5.भवानी प्रसाद मिश्र: घर की याद
- 6.त्रिलोचन: चम्पा काले काले अच्छर नहीं चीन्हती
- 7.दुष्यंत कुमार: गज़ल
8. अक्कमहादेवी: 1.हे भूख! मत मचल  
2. हे मेरे जूही के फूल जैसे ईश्वर;
- 9.अवतार सिंह पाश: सबसे खतरनाक;
- 10.निर्मला पुतुल: आओ, मिलकर बचाएँ ।

पाठ्य पुस्तक - आरोह-भाग 2,  
एन सी ई आर टी, नई दिल्ली द्वारा  
प्रकाशित

### काव्य खंड:

- हरिवंश राय बच्चन: 1. आत्मपरिचय  
2. एक गीत
- आलोक धन्वा : पतंग
- कुँवर नारायण: 1. कविता के बहाने  
2. बात सीधी थी पर
- रघुवीर सहाय : कैमरे में बंद अपाहिज
- गजानन माधव मुक्तिबोध : सहर्ष स्वीकारा है
- शमशेर बहादुर सिंह : उषा
- सूर्यकांत त्रिपाठी निराला : बादल राग
- तुलसीदास: 1.कवितावली (उत्तर कांड से)  
2.लक्ष्मण-मूर्च्छा और राम का विलाप
- फिराक़ गोरखपुरी: 1. रुबाइयाँ  
2. गज़ल
- उमाशंकर जोशी : 1. छोटा मेरा खेत  
2. बगुलों के पंख

### गद्य खंड :

- महादेवी वर्मा : भक्तिन
- जैनैंद्र कुमार : बाज़ार दर्शन
- धर्मवीर भारती : काले मेघा पानी दे
- फणीश्वर नाथ रेणु: पहलवान की ढोलक
- विष्णु खरे: चालीं चैपलिन यानी हम सब

**2. सहायक पाठ्य पुस्तक - वितान-भाग 1, एन सी ई आर टी, नई दिल्ली द्वारा प्रकाशित**

1. कुमार गंधर्व: भारतीय गायिकाओं में बेजोड़: लता मंगेशकर
2. अनुपम मिश्र: राजस्थान की रजत बूँदें
3. बेबी हलदार: आलो-आँधारि
4. भारतीय कलाएँ
5. लेखकों के बारे में

रज़िया सज्जाद ज़हीर: नमक  
हज़ारी प्रसाद द्विवेदी : शिरीष के फूल  
बाबा साहेब भीमराव आम्बेडकर:

1. श्रम विभाजन और जाति-प्रथा
2. मेरी कल्पना का आदर्श समाज

**2. सहायक पाठ्य पुस्तक - वितान-भाग 2, एन सी ई आर टी, नई दिल्ली द्वारा प्रकाशित**

1. मनोहर श्याम जोशी: सिल्वर वैडिंग ;
2. आनंद यादव: जूझ
3. ओम थानवी: अतीत में दबे पाँव
4. ऐन फ्रैंक: डायरी के पन्ने

**बिम्ब, अलंकार, छंद तथा काव्य-रूप**

**कोड मिक्सिंग तथा कोड स्विचिंग,**

**पद तथा पदक्रम-** संज्ञा एवं संज्ञा-भेद, लिंग, वचन, कारक; सर्वनाम एवं सर्वनाम-भेद; विशेषण एवं विशेषण-भेद, प्रविशेषण; क्रिया एवं क्रिया-भेद, वाच्य; अव्यय एवं अव्यय-भेद; निपात,

**शब्द - भंडार और शब्द निर्माण-** शब्दों का वर्गीकरण

**स्रोत ,उत्पत्ति या इतिहास के आधार पर** – तत्सम ,तद्भव, देशज ,आगत) विदेशज(, संकर

**रचना के आधार पर** – मूल या रूढ़ शब्द ,व्युत्पन्न शब्द -यौगिक ,योगरूढ़

**अर्थ के आधार पर** – पर्यायवाची ,विलोमार्थी ,एकार्थी ,अनेकार्थी ,श्रुतिसम भिन्नार्थक शब्द

**शब्द निर्माण** - उपसर्ग, प्रत्यय, समास, युग्म शब्द, पुनरुक्त शब्द

### 3. अभिव्यक्ति और माध्यम, एन सी ई आर टी, नई दिल्ली द्वारा प्रकाशित जनसंचार माध्यम

पत्रकारिता के विविध आयाम

विभिन्न माध्यमों के लिए लेखन

पत्रकारीय लेखन के विभिन्न रूप और लेखन प्रक्रिया

विशेष लेखन-स्वरूप और प्रकार

कैसे बनती है कविता

नाटक लिखने का व्याकरण

कैसे लिखें कहानी

डायरी लिखने की कला

कथा-पटकथा

कैसे करें कहानी का नाट्य रूपांतरण

कैसे बनता है रेडियो नाटक

नए और अप्रत्याशित विषयों पर लेखन

कार्यालयी लेखन और प्रक्रिया

स्ववृत्त लेखन और रोजगार संबंधी आवेदन पत्र

शब्दकोश: संदर्भ ग्रंथों की उपयोगी विधि और परिचय

हिन्दी भाषा और अनुप्रयुक्त व्याकरण  
खण्ड – क

1. हिन्दी भाषा और व्याकरण
2. वर्ण व्यवस्था - वर्ण, मात्रा, अक्षर
3. वर्तनी तथा वर्तनी व्यवस्था - वर्ण स्तर पर, शब्द स्तर पर, वाक्य स्तर पर; वर्तनी की सामान्य अशुद्धियाँ
4. सन्धि भेद- स्वर सन्धि, व्यंजन सन्धि, वसर्ग सन्धि, हिन्दी की अपनी संधियाँ।
5. शब्द - भंडार और शब्द निर्माण - शब्दों का वर्गीकरण  
स्रोत, उत्पत्ति या इतिहास के आधार पर – तत्सम, तद्भव, देशज, आगत (वदेशज), संकर  
रचना के आधार पर – मूल या रूढ़ शब्द, व्युत्पन्न शब्द- यौगक, योगरूढ़  
अर्थ के आधार पर – पर्यायवाची, वलोमार्थी, एकार्थी, अनेकार्थी, श्रुतिसम भन्नार्थक शब्द  
शब्द निर्माण - उपसर्ग, प्रत्यय, समास, युग्म शब्द, पुनरुक्त शब्द
6. पद व्यवस्था - शब्द और पद  
पद के भेद – संज्ञा एवं संज्ञा-भेद, लंग, वचन, कारक; सर्वनाम एवं सर्वनाम-भेद; विशेषण एवं विशेषण-भेद,  
प्रविशेषण; क्रिया एवं क्रिया-भेद, वाच्य; अव्यय एवं अव्यय-भेद
7. पद- परिचय - संज्ञा, सर्वनाम, विशेषण, क्रिया, अव्यय
8. वाक्य-व्यवस्था –  
वाक्य के अंग- उद्देश्य, वधेय;  
वाक्य रचना- वाक्य के अनिवार्य तथा ऐच्छिक घटक; पदबंध और उपवाक्य;  
वाक्य के प्रकार - रचना के आधार पर; अर्थ के आधार पर; वाक्य रचना की अशुद्धियाँ, वाक्य रूपांतरण
10. मुहावरे और लोकोक्तियाँ
11. अलंकार– अनुप्रास, पुनरुक्ति, यमक, उपमा, उत्प्रेक्षा, रूपक, अतिशयोक्ति, मानवीकरण

खण्ड - ख

अवबोधन तथा रचनात्मक अभिव्यक्ति

-12पाठ- बोधन – अपठित पद्य एवं गद्य

13. लखत रचना –

अ -पत्र लेखन - प्रार्थना पत्र, आवेदन पत्र, बधाई पत्र, शुभकामना पत्र, निमंत्रण पत्र, संवेदना पत्र, शिकायती पत्र, समस्या-  
सम्बन्धी (प्रकाशनार्थ)पत्र

आ- अनुच्छेद लेखन, स्ववृत्त लेखन, संवाद लेखन, वज्ञापन लेखन, सूचना लेखन

प्रशक्षत-स्नातक शक्षक हिन्दी(हेतु) पाठ्यक्रम

<p>पाठ्य पुस्तक- वसंत, भाग-1</p> <ol style="list-style-type: none"> <li>1. वह चड़या जो</li> <li>2. बचपन</li> <li>3. नादान दोस्त</li> <li>4. चाँद से थोड़ी सी गप्पें</li> <li>5. अक्षरों का महत्व</li> <li>6. पार नज़र के</li> <li>7. साथी हाथ बढ़ाना</li> <li>8. ऐसे – ऐसे</li> <li>9. टिकट एल्बम</li> <li>10. झांसी की रानी</li> <li>11. जो देखकर भी नहीं देखते</li> <li>12. संसार पुस्तक है</li> <li>13. मैं सबसे छोटी होऊँ</li> <li>14. लोकगीत</li> <li>15. नौकर</li> <li>16. वन के मार्ग में</li> <li>17. साँस-साँस में बांस</li> </ol> <p>पूरक पाठ्य पुस्तक - बाल राम कथा</p> <ol style="list-style-type: none"> <li>1. अवधपुरी में राम</li> <li>2. जंगल और जनकपुर</li> <li>3. दो वरदान</li> <li>4. राम का वन गमन</li> <li>5. चत्रकूट में भरत</li> <li>6. दंडक वन में दस वर्ष</li> <li>7. सोने का हिरन</li> <li>8. सीता की खोज</li> <li>9. राम और सुग्रीव</li> <li>10. लंका में हनुमान</li> <li>11. लंका वजय</li> <li>12. राम का राज्याभषेक</li> </ol>	<p>पाठ्य पुस्तक- वसंत, भाग-2</p> <ol style="list-style-type: none"> <li>1. हम पंछी उन्मुक्त गगन के</li> <li>2. दादी माँ</li> <li>3. हिमालय की बेटियाँ</li> <li>4. कठपुतली</li> <li>5. मठाईवाला</li> <li>6. रक्त और हमारा शरीर</li> <li>7. पापा खो गए</li> <li>8. शाम एक कशान</li> <li>9. चड़या की बच्ची</li> <li>10. अपूर्व अनुभव</li> <li>11. रहीम के दोहे</li> <li>12. कंचा</li> <li>13. एक तिनका</li> <li>14. खानपान की बदलती तस्वीर</li> <li>15. नीलकण्ठ</li> <li>16. भोर और बरखा</li> <li>17. वीर कुँवर संह</li> <li>18. संघर्ष के कारण मैं तुनुकमजाज हो गया</li> <li>19. आश्रम का अनुमानित व्यय</li> <li>20. वप्लव गायन</li> </ol> <p>पूरक पाठ्य पुस्तक - बाल महाभारत कथा</p>	<p>पाठ्य पुस्तक- वसंत, भाग-3 :</p> <ol style="list-style-type: none"> <li>1. ध्वनि</li> <li>2. लाख की चूड़ियाँ</li> <li>3. बस की यात्रा</li> <li>4. दीवानों की हस्ती</li> <li>5. चथियों की अनूठी दुनिया</li> <li>6. भगवान के डाकए</li> <li>7. क्या निराश हुआ जाए</li> <li>9. यह सबसे कठिन समय नहीं</li> <li>10. कबीर की साखयाँ</li> <li>11. कामचोर</li> <li>12. जब सनेमा ने बोलना सीखा</li> <li>13. सुदामा चरित</li> <li>14. जहाँ पहिया है</li> <li>15. अकबरी लोटा</li> <li>16. सूर के पद</li> <li>17. पानी की कहानी</li> <li>18. बाज़ और साँप</li> <li>19. टोपी</li> </ol> <p>पूरक पाठ्य पुस्तक - भारत की खोज</p> <ol style="list-style-type: none"> <li>1. अहमद नगर का कला</li> <li>2. तलाश</li> <li>3. संधु घाटी सभ्यता</li> <li>4. युगों का दौर</li> <li>5. नयी समस्याएँ</li> <li>6. अंतिम दौर: एक</li> <li>7. अंतिम दौर: दो</li> <li>8. तनाव</li> <li>9. दो पृष्ठभूमियाँ-भारतीय और अँग्रेजी</li> </ol>
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<p>पाठ्य पुस्तक- क्षतिज भाग 1-</p> <ol style="list-style-type: none"> <li>1.दो बैलों की कथा</li> <li>2.ल्हासा की ओर</li> <li>3.उपभोक्तावाद की संस्कृति</li> <li>4.साँवले सपनों की याद</li> <li>5.नाना साहब की पुत्री देवी मैना को भस्म कर दिया गया</li> <li>6.प्रेमचंद के फटे जूते</li> <li>7.मेरे बचपन के दिन</li> <li>8.एक कुत्ता और एक मैना</li> <li>9.साखियाँ एवं सबद</li> <li>10.वाख</li> <li>11.सवैये</li> <li>12.कैदी और कोकोला</li> <li>13.ग्रामश्री</li> <li>14. चंद्र गहना से लौटती बेर</li> <li>15.मेघ आए</li> <li>16.यमराज की दिशा</li> <li>17.बच्चे काम पर जा रहे हैं</li> </ol>	<p>पाठ्य पुस्तक- क्षतिज भाग -2</p> <ol style="list-style-type: none"> <li>1.पद- ऊधौं तुम हो अति बड़भागी, मन की मन ही माँझ रही, हमारे हरि हरिल की लकरी, हरि है राजनीति पढ़ि आए</li> <li>2. राम-लक्ष्मण परशुराम संवाद</li> <li>3.सवैया - पाँयनि नूपुर ....., कवत्त - डार द्रुम पलना ....., कवत्त - फटक सलानि ...</li> <li>4.आत्मकथ्य</li> <li>5.उत्साह, अट नहीं रही है</li> <li>6.यह दंतुरित मुसकान , फसल</li> <li>7.छाया मत छूना</li> <li>8.कन्यादान</li> <li>9.संगतकार</li> <li>10.नेताजी का चश्मा</li> <li>11.बालगोबिन भगत</li> <li>12.लखनवी अंदाज़</li> <li>13.मानवीय करुणा की दिव्य चमक</li> <li>14.एक कहानी यह भी</li> <li>15.स्त्री-शिक्षा के वरोधी कुतर्कों का खंडन</li> <li>16.नौबतखाने में इबादत</li> <li>17.संस्कृति</li> </ol>	
<p>पूरक पाठ्य पुस्तक - कृतिका भाग -1</p> <ol style="list-style-type: none"> <li>1. इस जल प्रलय में</li> <li>2. मेरे संग की औरतें</li> <li>3.रीढ़ की हड्डी</li> <li>4.माटी वाली</li> <li>5.कस तरह आखरकार में हिन्दी में आया</li> </ol>	<p>पूरक पाठ्य पुस्तक - कृतिका भाग - 2</p> <ol style="list-style-type: none"> <li>1.माता का अँचल;</li> <li>2.जॉर्ज पंचम की नाक;</li> <li>3.साना साना हाथ जोड़ .....</li> <li>4.एही ठैया झुलनी हेरानी हो रामा;</li> <li>5.में क्यों लखता हूँ ।</li> </ol>	

प्रशक्त-स्नातक शक्षक संस्कृत हेतु वषय-वशेष पाठ्यक्रम

रुचरा, प्रथमो भागः, एन सी ई आर टी, नई दिल्ली द्वारा प्रकाशत

शब्दपरिचयः-I; शब्दपरिचयः-II; शब्दपरिचयः-III; वद्यालयः ; वृक्षाः ; समुद्रतटः ; बकस्य प्रतीकारः ; सूक्तिस्तबकः ; क्रीडास्पर्धा ; कृषकाः कर्मवीराः ; पुष्पोत्सवः ; दशमः त्वम् अस ; वमानयानं रचयाम ; अहह आः च ; मातुलचन्द्र! (बालगीतम्) ; कारक- वभक्ति-परिचयः, शब्दरूपाण धातुरूपाण च

रुचरा, द्वतीयो भागः, एन सी ई आर टी, नई दिल्ली द्वारा प्रकाशत

सुभाषतानि ; दुर्बुद्धः वनश्यति ; स्वावलम्बनम् ; हास्यबालकवसम्मेलनम् ; पण्डिता रमाबाई ; सदाचारः ; सदाचारः ; सङ्कल्पः सद्दायकः ; त्रिवर्णः ध्वजः ; अहमप वद्यालयं गमष्याम; वशवबन्धुत्वम्; समवायो हि हि दुर्जयः ; वद्याधनम् ; अमृतं संस्कृतम् ; अनारिकायाः जिज्ञासा; लालनगीतम् ; परिशष्टम् वर्णवचारः, कारकम्, शब्दरूपाण धातुरूपाण च

रुचरा, तृतीयो भागः, एन सी ई आर टी, नई दिल्ली द्वारा प्रकाशत

सुभाषतानि ; बिलस्य वाणी न कदाप मे श्रुता ; डजीभारतम् ; सदैव पुरतो निधेहि चरणम् ; कण्टकेनैव कण्टकम् ; गृहं शून्यं सुतां वना ; भारतजनताहम् ; संसारसागरस्य नायकाः ; सप्तभग्न्यः ; नीतिनवनीतम् ; सावत्री बाई फुले ; कः रक्षति कः रक्षतः ; क्षतौ राजते भारतस्वर्णभूमः ; आर्यभटः ; प्रहेलकाः ; परिशष्टम् परिशष्टम् सन्धिः, कारकम्, शब्दरूपाण धातुरूपाण च

शेमुषी, प्रथमो भागः, एन सी ई आर टी, नई दिल्ली द्वारा प्रकाशत

भारतीवसन्तगीतिः ; स्वर्णकाकः ; गोदोहनम् ; कल्पतरुः ; सूक्तिमौक्तिकम् ; भ्रान्तो बालः ; प्रत्यभज्ञानम् ; लौहतुला ; - सकतासेतुः ; जटायोः शौर्यम् ; पर्यावरणम् ; वाङ्मनः प्राणस्वरूपम्

शेमुषी, द्वतीयो भागः, एन सी ई आर टी, नई दिल्ली द्वारा प्रकाशत

शुचपर्यावरणम् ; बुद्धर्बलवती सदा ; व्यायामः सर्वदा पथ्यः ; शशुलालनम् ; जननी तुल्यवत्सला ; सुभाषतानि सुभाषतानि ; सौहार्दं प्रकृतेः शोभा ; वचनः साक्षी ; सूक्तयः ; भूकम्पवभीषका ; प्राणेभ्योऽप प्रयः सुहृद् ; अन्योक्तयः

व्याकरणवीथः,

वर्ण वचार, संज्ञा एवं परिभाषा प्रकरण, सन्धि, शब्दरूप, धातुरूप, उपसर्ग, अव्यय, प्रत्यय, समास, कारक और वभक्ति, वाच्य परिवर्तन, रचना प्रयोग, शब्दरूपाण, धातुरूपाण

## SUBJECT SPECIFIC SYLLABUS FOR THE POST OF TGT ENGLISH

### Subject Specific Syllabus

*Text Books* prescribed by NCERT for Classes VI to X:

Who Did Patrick's Homework?, How the Dog Found Himself a New Master?, Taro's Reward, An Indian-American Woman in Space: Kalpana Chawla , A Different Kind of School , Who I Am (Part-1) Fair Play ,The Banyan Tree , A House, A Home, The Kite, The Quarrel, Beauty, Where Do All The Teachers Go?,The Wonderful Words, Vocation, What if

Three Questions, The Squirrel, A Gift of Chappals, The Rebel,The Shed, Gopal and the Hilsa Fish, The Ashes that Made the Trees Bloom, Chivvy, Quality, Trees.

The Best Christmas Present in the World, The Tsumani, Glimpses of the Past, Bepin Babu, The Summit Within, The Ant and the Cricket, Geography Lesson, The Last Bargain, The School Boy

How the Camel Got his Hump, Children at Work, The Selfish Giant, The Treasure Within ,Princess September.

The Fun They Had, The Sound of Music, The Little Girl, A Truly Beautiful Mind, The Snake and the Mirror, My Childhood, Reach For The Top, Kathmandu, If I were You , The Road Not Taken, Wind, Rain on The Roof, The Lake Isle of Innisfree ,A Legend of The Northland, No Men Are Foreign, On Killing a Tree, A Slumber Did My Spirit Seal, The Lost Child, The Adventures of Toto, Iswaran the Storyteller, In the Kingdom of Fools, The Happy Prince, The Last Leaf, A House is not a Home, The Beggar .

Topics :

A Letter to God, Nelson Mandela - Long Walk to Freedom, Two Stories About Flying, .From the Diary of Anne Frank, Glimpses of India, Mijbil the Otter, Madam Rides the Bus, The Sermon at Benares, The Proposal , Dust of Snow , Fire and Ice , A Tiger in the Zoo, .How to Tell Wild Animals,The Ball Poem, Amanda! ,The Trees,.Fog, The Tale of Custard the Dragon, For Anne Gregory, A Triumph of Surgery, The Thief's Story, The Midnight Visitor, A Question of Trust ,Footprints Without Feet ,The Making of a Scientist, The Necklace ,Bholi, The Book That Saved the Earth

*Grammar :*

Determiners, linking words, adverbs (place and types), tense forms, clauses, passivation, adjectives (comparative and superlative forms), modal auxiliaries, word order in sentence types, reported speech, Sequence of tenses, non-finites (infinitives, gerunds, participles, complex and compound sentences, phrasal verbs and prepositional phrases, cohesive devices, punctuation(semicolon, colon, dash, hyphen, parenthesis or use of brackets and exclamation mark).

## **SUBJECT SPECIFIC SYLLABUS FOR THE POST OF TGT MATHEMATICS**

### **Subject Specific Syllabus**

#### Number System:

Knowing Numbers, Playing with numbers ,Whole numbers, Negative Numbers and Integers, Fractions Algebra: Introduction, Ratio and Proportion, Knowing Numbers- Integers, Fractions and Rational Numbers, Powers, Squares, Square roots, Cubes, Cube roots , Real Numbers

#### Geometry:

Basic geometrical ideas (2 -D), Understanding Elementary Shapes (2-D and 3-D), Triangles, Circles, Constructions

Symmetry: (reflection) Constructions (Using Straight edge Scale, Protractor, Compasses), Understanding shapes, Representing 3-D in 2-D

#### Mensuration:

Concept of Perimeter and Area, Areas Related to Circles , Surface Areas and Volumes

#### Algebra:

Algebraic Expressions, Ratio and Proportion

Geometry: Understanding Shapes, Properties of Triangles, Symmetry, Representing 3-D in 2-D, Congruence, Construction (Using scale, protractor, compass), Polynomials, Linear Equations in Two Variables, Polynomials, Pair of Linear Equations in Two Variables, Quadratic Equations, Quadratic Equations, Arithmetic Progressions

Coordinate Geometry, Lines In two-dimensions, Geometry (Euclid's Geometry, Lines and Angles, Triangles, Quadrilaterals, Area, Circles, Constructions),

Data handling, Statistics and Probability

Trigonometry -Introduction, Heights and Distances

**SUBJECT SPECIFIC SYLLABUS FOR THE POST OF  
TGT SCIENCE**

**Subject Specific Syllabus**

Food (Sources and Component and Cleaning), Material (Materials of daily use, Different kinds of materials, How things change/ react with one another), The World of the Living (Things around us, The habitat of the living, Plants – form and function, Animals – form and function), Moving Things, People and Ideas (Moving, How things work (Electric current and circuits), Magnets, Natural Phenomena (Rain, thunder and lightning, Light), Natural Resources (Importance of water, Importance of air, Waste)

Food (Food from where, Utilisation of food), Materials (Materials of daily use, Different kinds of materials, How things change/ react with one another), The World of the Living (Surroundings affect the living, The breath of life, Movement of substances, Multiplication in plants), Moving People and Ideas (Moving objects), How Things Work (Electric current and circuits), Natural Phenomena (Rain, thunder and lightning, Light), Natural Resources (Scarcity of water, Forest products, Waste Management)

Food (Crop production, Micro-organisms), Materials (Materials in daily life, Different kinds of materials and their reactions, How things change/ react with one another), The World of the Living (Why conserve, The cell, How babies are formed), Moving things, People and Ideas (Idea of force, Friction, Pressure, Sound), How Things Work (Electric current and circuits), Natural Phenomena (Rain, thunder and lightning, Light, Night sky, Earthquakes), Natural Resources (Man's intervention in phenomena of nature, Pollution of air and water)

Food, Material, The World of the Living, Moving Things, People and Ideas, How Things Work, Natural Phenomena, Natural Resources,

## SUBJECT SPECIFIC SYLLABUS FOR THE POST OF TGT SOCIAL STUDIES

### Subject Specific Syllabus

#### **History:**

When, Where and How, The Earliest Societies, The First Farmers and Herders, The First Cities, Different Ways of Life

Early states, New Ideas (Upanishads, Jainism, Buddhism), The First Empire, Life in towns and villages, Contacts with Distant lands, Political Developments, Culture and Science.

Where, When and How, New Kings and Kingdoms, The Sultans of Delhi, The Creation of An Empire, Architecture as Power: Forts and Sacred Places, Towns, Traders and Craftsmen, Social Change: Mobile and settled communities, Popular Beliefs and Religious Debates, The Flowering of Regional Cultures, New Political Formations in the Eighteenth Century.

Where, When, How, The Establishment of Company Power, Rural Life and Society, Colonialism and Tribal Societies, Crafts and Industries, The Revolt of 1857-58, Education and British rule, Women and reform, Challenging the Caste System, Colonialism and Urban Change, Changes in the Arts: Painting, Literature, architecture, The Nationalist Movement, India after Independence.

Events and Processes (French Revolution, Russian Revolution, Rise of Nazism), Economies and Livelihoods (Pastoralists in the Modern World, Forest Society and Colonialism, Farmers and Peasants), Culture, Identity and Society (Sports and Politics. The Story of Cricket, Clothes and Cultures).

Events and Processes (Nationalism in Europe, Nationalist Movement in Indo-China, Nationalism in India: Civil Disobedience Movement), Economies and Livelihoods (Industrialisation 1850s–1950s, Urbanisation and Urban Lives, Trade and Globalization), Culture, Identity and Society (Print Culture and Nationalism, History of the Novel).

#### **Geography:**

*The Earth: Our Habitat:*

Planet: Earth in the solar system.

Globe: the model of the earth, latitudes and longitudes; motions of the earth rotation and revolution.

Maps: essential components, Four realms of the earth: lithosphere, hydrosphere, atmosphere and biosphere, Major relief features of the earth.

India in the world: physiographic divisions of India.

*Our Environment:*

Environment in its totality, Natural Environment: land, Air, Water, Natural vegetation and wild life, Human Environment, Human – Environment Interaction

India: Location, relief, structure, major physiographic units, Climate, Drainage, Natural Vegetation, Wildlife, Population.

***Resources & Development:***

Resources: resources and their types – natural and human, Natural resources, Agriculture, Industries, Human Resources  
Natural Resources, Forest and wildlife resources, Agriculture, Water resources, Mineral Resources, Power Resources, Manufacturing Industries, Transport, communication and trade.

**Social and Political Life:**

Diversity & Independence: Diversity, Government, Local Government, (Panchayati Raj, Urban Local, Rural Administration), Making a Living (Rural Livelihoods, Urban Livelihoods).

Democracy and Equality: Democracy (Why Democracy, Institutional representation of Democracy), State Government (Working and functioning), Understanding Media (Media and Democracy, Advertising), Unpacking Gender (Social Aspects, Economic Aspect), Markets Around Us.

Rule of Law and social Justice: The Constitution, Parliamentary Government. The Judiciary, Social Justice and the Marginalised, Economic Presence of the Government.

Democracy in contemporary world, What is democracy? Why democracy?, Designing of democracy in India, Electoral politics in democracy, Institutions of parliamentary democracy, Citizens' rights in democracy

Working of democracy, Power sharing mechanisms in democracy, Competition and contestations in democracy, Outcomes of democracy, Challenges to democracy

**Economics:**

Development, Money and Financial System, The Role of Service Sector in Indian Economy, Globalisation, Consumer Awareness, Concept of production, People as Resource, Poverty as a Challenge Facing India, Food Security,

## Scheme of Exam for Recruitment of TGTs through LDCE:

The written test is of 180 marks (180 objective type multiple choice questions) carrying 01 mark for each question. The duration of written test will be 180 minutes.

### Section Name -Nature of Questions

#### Part I - General awareness & Reasoning (20 marks):

- (a) General Awareness & Current Affairs (10 questions)
- (b) Reasoning Ability (10 questions)

#### Part-II: Perspectives on Education and Leadership (40 marks)

- (a) Understanding the Learner-(10 questions)
  - (b) Understanding Teaching Learning -(15 questions)
  - (c) Creating Conducive Learning Environment
  - (d) School Organization and Leadership
  - (e) Perspectives in Education
- } (15 questions)

#### Part III - Subject-specific Syllabus (120 marks)

- No Interview

**Note:** Minimum 40% marks would qualify for empanelment.

## Syllabus of Exam for Recruitment of Trained Graduate Teacher through LDE:

#### Part I - General awareness & Reasoning

(20 marks):

- a) General Awareness & Current Affairs (10 questions)
- (c) Reasoning Ability (10 questions)

#### Part-II Perspectives on Education and Leadership (40 marks):

##### (a) Understanding the Learner(10 questions)

- Concept of growth, maturation and development, principles and debates of development, development tasks and challenges
- Domains of Development: Physical, Cognitive, Socio-emotional, Moral etc., deviations in development and its implications.
- Understanding Adolescence: Needs, challenges and implications for designing institutional support.
- Role of Primary and Secondary Socialization agencies. Ensuring Home school continuity.

##### (b) Understanding Teaching Learning (15 questions)

- Theoretical perspectives on Learning -Behaviorism, Cognitivism and Constructivism with special reference to their implications for:
  - i. The role of teacher
  - ii. The role of learner
  - iii. Nature of teacher-student relationship
  - iv. Choice of teaching methods
  - v. Classroom environment
  - vi. Understanding of discipline, power etc.

- Factors affecting learning and their implications for:
  - i. Designing classroom instructions,
  - ii. Planning student activities and,
  - iii. Creating learning spaces in school.
- Planning and Organization of Teaching-Learning
  - i. Concept of Syllabus and Curriculum, Overt and Hidden Curriculum, Principles of curriculum organization
  - ii. Competency based Education, Experiential learning, etc.
  - iii. Instructional Plans: -Year Plan, Unit Plan, Lesson Plan
  - iv. Instructional material and resources
  - v. Information and Communication Technology(ICT) for teaching-learning
  - vi. Evaluation: Purpose, types and limitations. Continuous and Comprehensive Evaluation, Characteristics of a good tool.
  - vii. Assessment of learning, for learning and as learning: Meaning, purpose and considerations in planning each.
- Enhancing Teaching Learning processes: Classroom Observation and Feedback, Reflections and Dialogues as a means of constructivist teaching

#### **c) Creating Conducive Learning Environment (06 questions)**

- The concepts of Diversity, disability and Inclusion, implications of disability as social construct, types of disabilities-their identification and interventions
- Concept of School Mental Health, addressing the curative, preventive and promotive dimensions of mental health for all students and staff. Provisioning for guidance and counselling.
- Developing School and community as a learning resource.

#### **(d) School Organization and Leadership (06 questions)**

- Leader as reflective practitioner, team builder, initiator, coach and mentor.
- Perspectives on School Leadership: instructional, distributed and transformative
- Vision building, goal setting and creating a School development Plan
- Using School Processes and forums for strengthening teaching learning-Annual Calendar, time-tabling, parent teacher forums, school assembly, teacher development forums , using achievement data for improving teaching –learning, School Self Assessment and Improvement
- Creating partnerships with community , industry and other neighbouring schools and Higher Education Institutes – forming learning communities

#### **(e) Perspectives in Education (03 questions)**

- Role of school in achieving aims of education.
- NEP-2020: Curriculum and Pedagogy in Schools: Holistic & Integrated Learning; Equitable and Inclusive Education: Learning for All; Competency based learning and Education.
- Guiding Principles for Child Rights, Protecting and provisioning for rights of children to safe and secure school environment, Right of Children to free and Compulsory Education Act, 2009,
- Historically studying the National Policies in education with special reference to school education;
- School Curriculum Principles: Perspective, Learning and Knowledge, Curricular Areas, School Stages, Pedagogy and Assessment

### **Part III - Subject-specific Syllabus (120 marks): Refer Annexure**

**Note:** Minimum 40% marks would qualify for empanelment.