Scheme of Exam for Direct Recruitment of Post Graduate Teacher:

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 without any time limit for each part individually.

Section Name -Nature of Questions

Part I - Proficiency in Languages (20 marks):
A. General English-10 questions

B. General Hindi-10 questions

Part II – General awareness, Reasoning & Proficiency in Computers (20 marks)
1. General Awareness & Current Affairs(10 ques.)
2. Reasoning Ability (5 ques.)
3. Computer Literacy (5 ques.)

Part-III: Perspectives on Education and Leadership (40 questions)
(a) Understanding the Learner-(15 questions)
(b) Understanding Teaching Learning -(15 questions)
(c) Creating Conducive Learning Environment
(d) School Organization and Leadership- (10 questions)
(e) Perspectives in Education

Part IV - Subject-specific Syllabus (100 marks) – Refer Annexure

Scheme &Syllabus of Exam for Direct Recruitment of PGTs:

Part I - Proficiency in Languages (20 marks):

(a) General English(10 questions)
Reading comprehension, word power, Grammar & usage
(b) General Hindi(10 questions)
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Part II – General awareness, Reasoning & Proficiency in Computers (20 marks):

(g) General Awareness& Current Affairs**(10 questions)**
(h) Reasoning Ability**(5 questions)**
(i) Computer Literacy**(5 questions)**

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

(a) Understanding the Learner(15 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(04 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(04 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(02 questions)

- 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 IV - Subject-specific Syllabus (100 marks): Refer Annexure

Scheme of Exam for Direct Recruitment of Trained Graduate Teachers:

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 without any time limit for each part individually.

Section Name -Nature of Questions

Part I - Proficiency in Languages (20 marks):
A. General English-10 questions

B. General Hindi-10 questions

Part II – General awareness, Reasoning & Proficiency in Computers (20 marks)
4. General Awareness & Current Affairs (10 ques.)
5. Reasoning Ability (5 ques.)
6. Computer Literacy (5 ques.)

Part-III: Perspectives on Education and Leadership (40 questions)
(f) Understanding the Learner-(10 questions)
(g) Understanding Teaching Learning -(15 questions)
(h) Creating Conducive Learning Environment
(i) School Organization and Leadership
(j) Perspectives in Education
} (15 questions)

Part IV - Subject-specific Syllabus (100 marks)

Syllabus of Exam for Direct Recruitment of Trained Graduate Teachers:

Part I - Proficiency in Languages (20 marks):

(a) General English(10 questions)

Reading comprehension, word power, Grammar & usage

(b) General Hindi(10 questions)

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Part II – General awareness, Reasoning & Proficiency in Computers (20 marks):

(j) General Awareness& Current Affairs (10 questions)

(k) Reasoning Ability (5 questions)

(l) Computer Literacy(5 questions)

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

(c) 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.

(d) **Understanding Teaching Learning (15 questions)**

- Theoretical perspectives on Learning -Behaviorism, Cognitivism and Constructivism with special reference to their implications for:
  - vii. The role of teacher
  - viii. The role of learner
  - ix. Nature of teacher-student relationship
  - x. Choice of teaching methods
  - xi. Classroom environment
  - xii. Understanding of discipline, power etc.
- Factors affecting learning and their implications for:
  - iv. Designing classroom instructions,
  - v. Planning student activities and,
  - vi. Creating learning spaces in school.
- Planning and Organization of Teaching-Learning
  - viii. Concept of Syllabus and Curriculum, Overt and Hidden Curriculum, Principles of curriculum organization
  - ix. Competency based Education, Experiential learning, etc.
  - x. Instructional Plans: -Year Plan, Unit Plan, Lesson Plan
  - xi. Instructional material and resources
  - xii. Information and Communication Technology(ICT) for teaching-learning
  - xiii. Evaluation: Purpose, types and limitations. Continuous and Comprehensive Evaluation,Characteristics of a good tool.
  - xiv. 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 IV – Subject-specific Syllabus (100 marks): Refer Annexure

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Scheme of Exam for Direct Recruitment of PRTs:

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 without any time limit for each part individually.

Section name -Nature of Questions

Part I - Proficiency in Languages (20 marks):
A. General English-10 questions

B. General Hindi-10 questions

Part II – General awareness, Reasoning & Proficiency in Computers (20 marks)

7. General Awareness & Current Affairs (10 ques.)
8. Reasoning Ability (5 ques.)
9. Computer Literacy (5 ques.)

Part-III: Perspectives on Education and Leadership (60 questions)

(k) Understanding the Learner-(15 questions)
(l) Understanding Teaching Learning -(15 questions)
(m) Creating Conducive Learning Environment - (10 questions)
(n) School Organization and Leadership - (10 questions)
(o) Perspectives in Education (10 questions)

Part IV - Subject-specific Syllabus (80 marks)

Syllabus of Exam for Direct Recruitment of PRTs:

Part I - Proficiency in Languages (20 marks)

(a) General English

Reading comprehension, word power, Grammar & usage

(b) General Hindi

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Part II – General awareness, Reasoning & Proficiency in Computers (20 marks)

(m) General Awareness& Current Affairs

(n) Reasoning Ability

(o) Computer Literacy

Part III -Perspectives on Education and Leadership (60 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
- Foundational Literacy and Numeracy, Early Childhood Care and Education
- 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
- 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.
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Part IV - Subject-specific Syllabus – Refer annexure **(80 marks)**

Scheme of Examination for Direct Recruitment of Trained Graduate Teachers
Physical & Health Education

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)	No. of items
Part-I : Proficiency in Languages (30 Marks)	15 questions
A. General English (15 Marks)	
Reading comprehension, word power, Grammar & usage	15 questions
B. General Hindi (15 Marks)	
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Part-II : General Awareness, Reasoning & Proficiency in Computers (50 Marks)	
1. General Knowledge & Current Affairs related to subject/discipline	20 questions
2. Reasoning Ability	20 questions
3. Computer Literacy	10 questions
Part III: Subject-specific Syllabus (100 Marks)	100 Questions
Refer Annexure	

Syllabus for the post of PGT -Mathematics

Subject specific syllabus includes the concepts of NCERT/CBSE syllabus and Text Books (Classes XI & XII), however, the questions will be testing the depth of understanding and application of these concepts at the level of Post- Graduation.

Sets:

Sets and their representations, Empty set, Finite and Infinite sets, Equal sets, Subsets. Subsets of a set of real numbers especially intervals (with notations). Universal set. Venn diagrams. Union and Intersection of sets. Difference of sets. Complement of a set. Properties of Complement.

Relations & Functions:

Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the set of reals with itself (upto R x R x R).Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special type of relation. Pictorial representation of a function, domain, co-domain and range of a function. Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum, exponential, logarithmic and greatest integer functions, with their graphs. Sum, difference, product and quotients of functions.

Trigonometric Functions

Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Truth of the identity $\sin 2x + \cos 2x = 1$, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing $\sin(x \pm y)$ and $\cos(x \pm y)$ in terms of sinx, siny, cosx & cosy and their simple applications. Identities related to sin2x, cos2x, tan2 x, sin3x, cos3x and tan3x.

Complex Numbers and Quadratic Equations

Need for complex numbers, especially $\sqrt{-1}$, to be motivated by inability to solve some of the quardratic equations. Algebraic properties of complex numbers. Argand plane

Linear Inequalities

Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line.

Permutations and Combinations

Fundamental principle of counting. Factorial n. (n!) Permutations and combinations, derivation of Formulae for nPr and nCr and their connections, simple applications.

Binomial Theorem

Historical perspective, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, simple applications.

Sequence and Series

Sequence and Series. Arithmetic Progression (A. P.). Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P., sum of n terms of a G.P., infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M.

Straight Lines

Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axis, point -slope form, slope-intercept form. Distance of a point from a line.

Conic Sections

Sections of a cone: circles, ellipse, parabola, hyperbola, a point, a straight line and a pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.

Introduction to Three-dimensional Geometry

Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points.

Limits and Derivatives

Derivative introduced as rate of change both as that of distance function and geometrically. Intuitive idea of limit. Limits of polynomials and rational functions trigonometric, exponential and logarithmic functions. Definition of derivative relate it to scope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.

Statistics

Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data.

Probability

Random experiments; outcomes, sample spaces (set representation). Events; occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Axiomatic (set theoretic) probability, connections with other theories of earlier classes. Probability of an event, probability of 'not', 'and' and 'or' events.

Relations and Functions

Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions.

Inverse Trigonometric Functions

Definition, range, domain, principal value branch. Graphs of inverse trigonometric functions.

Matrices

Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. On commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2).Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries).

Determinants

Determinant of a square matrix (up to 3 x 3 matrices), minors, co-factors and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of system of linear equations by examples, solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

Continuity and Differentiability

Continuity and differentiability, derivative of composite functions, chain rule, derivative of inverse trigonometric functions, derivative of implicit functions. Concept of exponential and logarithmic functions. Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives.

Applications of Derivatives

Applications of derivatives: rate of change of bodies, increasing/decreasing functions, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).

Integrals

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problems based on them.

$$\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c}, \int \frac{dx}{\sqrt{ax^2+bx+c}}$$

$$\int \frac{px + q}{ax^2 + bx + c} dx, \int \frac{px + q}{\sqrt{ax^2+bx+c}} dx, \int \sqrt{a^2 \pm x^2}\, dx, \int \sqrt{x^2 - a^2}\, dx$$

$$\int \sqrt{ax^2 + bx + c}\, dx,$$

Fundamental Theorem of Calculus. Basic Properties of definite integrals and evaluation of definite integrals;

Applications of the Integrals

Applications in finding the area under simple curves, especially lines, circles/ parabolas/ellipses (in standard form only)

Differential Equations

Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type: dy /dx + py = q, where p and q are functions of x or constants. dx/ dy + px = q, where p and q are functions of y or constants.

Vectors

Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios of a vector. 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. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors.

Three - dimensional Geometry

Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, skew lines, shortest distance between two lines. Angle between two lines.

Linear Programming

Introduction, related terminology such as constraints, objective function, optimization, graphical method of solution for problems in two variables, feasible and infeasible regions (bounded or unbounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).

Probability

Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution, mean of random variable.

Syllabus for the post of PGT -Physics

Subject specific syllabus includes the concepts of NCERT/CBSE syllabus and Text Books (Classes XI & XII), however, the questions will be testing the depth of understanding and application of these concepts at the level of Post- Graduation.

Units and Measurements

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units, significant figures. Dimensions of physical quantities, dimensional analysis and its applications.

Motion in a Straight Line: Frame of reference, Motion in a straight line, Elementary concepts of differentiation and integration for describing motion, uniform and non- uniform motion, and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs, Relations for uniformly accelerated motion .

Motion in a Plane: Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors. Motion in a plane, cases of uniform velocity and uniform acceleration, projectile motion, uniform circular motion.

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, Static and kinetic friction, laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circular motion- vehicle on a level circular road, vehicle on a banked road.

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: non- conservative forces, motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.

Motion of System of Particles and Rigid Body & System of Particles and Rotational Motion

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 a uniform rod, Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications, Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects.

Gravitation:

Kepler's laws of planetary motion, universal law of gravitation, Acceleration due to gravity and its variation with altitude and depth. Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite.

Mechanical Properties of Solids

Elasticity, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity, Poisson's ratio; elastic energy.

Mechanical Properties of Fluids

Pressure due to a fluid column; Pascal's law and its applications -hydraulic lift and hydraulic brakes, effect of gravity on fluid pressure, Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its simple applications, Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.

Thermal Properties of Matter

Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat capacity. Heat transfer-conduction, convection and radiation, thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law.

Thermodynamics

Thermal equilibrium and definition of temperature, zeroth law of thermodynamics, heat, work and internal energy, First law of thermodynamics, Second law of thermodynamics: gaseous state of matter, change of condition of gaseous state -isothermal, adiabatic, reversible, irreversible, and cyclic processes.

Behavior of Perfect Gases and Kinetic Theory of Gases :

Equation of state of a perfect gas, work done in compressing a gas, Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equi-partition of energy and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.

Oscillations and Waves:

Periodic motion - time period, frequency, displacement as a function of time, periodic functions and their application, Simple harmonic motion (S.H.M) and its equations of motion; phase; oscillations of a loaded spring- restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum -its time period. Transverse and longitudinal waves, speed of travelling wave, 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.

Electric Charges and Fields:

Electric charges, Conservation of charge, Coulomb's law-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. Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell-field inside and outside.

Electrostatic Potential and Capacitance:

Electric potential, potential difference, electric potential due to a point charge, 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 polarization, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor

Current Electricity:

Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, V-I characteristics (Linear & Non-Linear), electrical energy and power, electrical resistivity and conductivity, 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 rules, Wheatstone bridge.

Magnetic Effects of Current and Magnetism:

Concept of magnetic field, Oersted's experiment, Biot - Savart law and its application to current carrying circular loop, Ampere's law and its applications to infinitely long straight wire. Straight solenoid, force on a moving charge in uniform magnetic and electric fields. Force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying

conductors-definition of ampere, torque experienced by a current loop in uniform magnetic field; Current loop as a magnetic dipole and its magnetic dipole moment, moving coil galvanometer - its current sensitivity and conversion to ammeter and voltmeter.

Magnetism and Matter

Bar magnet, bar magnet as an equivalent solenoid (qualitative treatment only), magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis (qualitative treatment only), torque on a magnetic dipole (bar magnet) in a uniform magnetic field (qualitative treatment only), magnetic field lines. Magnetic properties of materials- Para-, dia- and ferro - magnetic substances with examples, Magnetization of materials, effect of temperature on magnetic properties.

Electromagnetic Induction and Alternating Currents

Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction, Alternating Current Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LCR series circuit, resonance, power in AC circuits, power factor, wattless current, AC generator, Transformer.

Electromagnetic Waves

Basic idea of displacement current, Electromagnetic waves, their characteristics, their transverse nature (qualitative idea only). Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.

Ray Optics and Optical Instruments Ray Optics:

Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lens maker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism. Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Wave optics:

Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts, Proof of laws of reflection and refraction using Huygen's 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 maxima.

Dual Nature of Radiation and Matter:

Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light, Experimental study of photoelectric effect Matter waves-wave nature of particles, de-Broglie relation.

Atoms & Nuclei:

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of nth possible orbit, velocity and energy of electron in its orbit, hydrogen line spectra, Composition and size of nucleus, nuclear force Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission, nuclear fusion.

Semiconductor Electronics:

Energy bands in conductors, semiconductors and insulators, Intrinsic and extrinsic semiconductors- p and n type, p-n junction Semiconductor diode - I-V characteristics in forward and reverse bias, application of junction diode -diode as a rectifier.

Syllabus for the post of PGT -Chemistry

Subject specific syllabus includes the concepts of NCERT/CBSE syllabus and Text Books (Classes XI & XII), however, the questions will be testing the depth of understanding and application of these concepts at the level of Post- Graduation.

Basic Concepts of Chemistry: General Introduction: Importance and scope of Chemistry. Nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules. Atomic and molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.

Structure of Atom: Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars. Thomson's model and its limitations. Rutherford's model and its limitations, Bohr's model and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals - Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals.

Classification of Elements and Periodicity in Properties: Significance of classification, brief history of the development of periodic table, modern periodic law and the present form of periodic table, periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100.

Chemical Bonding and Molecular Structure: Valence electrons, ionic bond, covalent bond, bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s, p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only), Hydrogen bond.

Chemical Thermodynamics: Concepts of System and types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions. First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat, measurement of ΔU & ΔH, Hess's law of constant heat summation, enthalpy of bond of dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. Second law of Thermodynamics, Introduction of entropy as a state function, Gibb's energy change for spontaneous and nonspontaneous processes, criteria for equilibrium. Third law of thermodynamics.

Equilibrium: Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium - Le Chatelier's principle, ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength, concept of pH, hydrolysis of salts (elementary idea), buffer solution, Henderson Equation, solubility product, common ion effect (with illustrative examples).

Redox Reactions: Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number, applications of redox reactions.

Organic Chemistry -Some Basic Principles and Techniques: General introduction, methods of purification, qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

Classification of Hydrocarbons

Aliphatic Hydrocarbons:
Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis. Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markovnikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition. Alkynes - Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of - hydrogen, halogens, hydrogen halides and water.
Aromatic Hydrocarbons: Introduction, IUPAC nomenclature, benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution. Nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, directive influence of functional group in monosubstituted benzene. Carcinogenicity and toxicity.

Solutions

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, Raoult's law, colligative properties - relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor.

Electrochemistry

Redox reactions, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell-electrolytic cells and Galvanic cells, lead accumulator, fuel cells, corrosion.

Chemical Kinetics

Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment), activation energy, Arrhenius equation.

d and f Block Elements

General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first-row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$. **Lanthanoids** – Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. **Actinoids** - Electronic configuration, oxidation states and comparison with lanthanoids.

Coordination Compounds

Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT; structure and stereoisomerism, importance of coordination compounds (in qualitative analysis, extraction of metals and biological system).

Haloalkanes and Haloarenes.

Haloalkanes: Nomenclature, nature of C–X bond, physical and chemical properties, optical rotation mechanism of substitution reactions. **Haloarenes:** Nature of C–X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only). Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

Alcohols, Phenols and Ethers

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses with special reference to methanol and ethanol. **Phenols:** Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols. **Ethers:** Nomenclature, methods of preparation, physical and chemical properties, uses.

Aldehydes, Ketones and Carboxylic Acids

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses. **Carboxylic Acids:** Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Amines

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines. Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.

Biomolecules

Carbohydrates - Classification (aldoses and ketoses), monosaccahrides (glucose and fructose), D-L configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates. **Proteins** -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes. Hormones - Elementary idea excluding structure. **Vitamins** - Classification and functions. Nucleic Acids: DNA and RNA.

Syllabus for the post of PGT -Biology

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The Living World

Biodiversity; Need for classification; three domains of life; taxonomy and systematics; concept of species and taxonomical hierarchy; binomial nomenclature

Biological Classification

Five kingdom classification; Salient features and classification of Monera, Protista and Fungi into major groups; Lichens, Viruses and Viroids.

Plant Kingdom

Classification of plants into major groups; Salient and distinguishing features and a few examples of Algae, Bryophyta, Pteridophyta, Gymnospermae (Topics excluded – Angiosperms, Plant Life Cycle and Alternation of Generations)

Animal Kingdom

Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level (salient features and at a few examples of each category).

Morphology of Flowering Plants

Morphology of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed. Description of families: Solanaceae

Anatomy of Flowering Plants

Anatomy and functions of tissue systems in dicots and monocots.

Structural Organisation in Animals

Morphology, Anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of frog.

Cell-The Unit of Life

Cell theory and cell as the basic unit of life, structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; cell envelope; cell membrane, cell wall; cell organelles - structure and function; endomembrane system- endoplasmic reticulum, ribosomes, golgi bodies, lysosomes, vacuoles; mitochondria, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus.

Biomolecules

Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids; Enzymes - properties, enzyme action.

Cell Cycle and Cell Division

Cell cycle, mitosis, meiosis and their significance

Photosynthesis in Higher Plants

Photosynthesis as a means of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis.

Respiration in Plants

Exchange of gases; cellular respiration - glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations - number of ATP molecules generated; amphibolic pathways; respiratory quotient.

Plant - Growth and Development

Seed germination; phases of plant growth and plant growth rate; conditions for growth; differentiation, dedifferentiation and redifferentiation; sequence of developmental processes in a plant cell; growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA.

Breathing and Exchange of Gases

Introduction to respiratory organs in animals; Respiratory system in humans; mechanism of breathing and its regulation in humans - exchange of gases, transport of gases and regulation of respiration, respiratory volumes; disorders related to respiration - asthma, emphysema, occupational respiratory disorders.

Body Fluids and Circulation

Composition of blood, blood groups, coagulation of blood; composition of lymph and its function; human circulatory system - Structure of human heart and blood vessels; cardiac cycle, cardiac output, ECG; double circulation; regulation of cardiac activity; disorders of circulatory system - hypertension, coronary artery disease, angina pectoris, heart failure.

Excretory Products and their Elimination

Modes of excretion - ammonotelism, ureotelism, uricotelism; human excretory system – structure and function; urine formation, osmoregulation; regulation of kidney function - renin - angiotensin, atrial natriuretic factor, ADH, diabetes insipidus; micturition; role of other organs in excretion; disorders - uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant.

Locomotion and Movement

Types of movement – amoeboid, ciliary, flagellar, muscular; skeletal muscle, contractile proteins and muscle contraction; skeletal system and its functions; joints; disorders of muscular and skeletal systems - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.

Neural Control and Coordination

Neuron and nerves; Nervous system in humans - central nervous system and peripheral nervous system; generation and conduction of nerve impulse; visceral nervous system.

Chemical Coordination and Integration

Endocrine glands and hormones; human endocrine system - hypothalamus, pituitary, pineal, thyroid, parathyroid, thymus, adrenal, pancreas, gonads; hormones of heart, kidney and gastrointestinal tract; mechanism of hormone action (elementary idea); role of hormones as messengers and regulators, hypo - and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goiter, exophthalmic goiter, diabetes, Addison's disease.

Sexual Reproduction in Flowering Plants

Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and embryo, development of seed and formation of fruit; special modes- apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation.

Human Reproduction

Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis - spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation ; parturition ; lactation .

Reproductive Health

Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need and methods; medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT

Principles of Inheritance and Variation

Heredity and variation, Mendelian inheritance; deviations from Mendelism – incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; linkage and crossing over; Sex determination - in human being, birds and honey bee; sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans –thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

Molecular Basis of Inheritance

Structure of DNA and RNA; DNA packaging; Search for genetic material and DNA as genetic 8 material; DNA replication; Central Dogma; transcription, genetic code, translation; gene expression and regulation - lac operon; Human genome project; DNA fingerprinting.

Evolution

Origin of life; biological evolution and evidences for biological evolution (paleontology, comparative anatomy, embryology and molecular evidences); adaptive radiation; Darwin's theory of evolution; mechanism of evolution - variation (mutation and recombination) and natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy - Weinberg's principle; human evolution

Human Health and Diseases

Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

Biotechnology - Principles and Processes

Genetic Engineering (Recombinant DNA Technology).

Biotechnology and its Application

Application of biotechnology in health and agriculture: genetically modified organisms - Bt crops; Human insulin, gene therapy; molecular diagnosis; transgenic animals; biosafety issues, biopiracy and patents.

Organisms and Populations

Population interactions - mutualism, competition, predation, parasitism, commensalism; population attributes - growth, birth rate and death rate, age distribution.

Ecosystem

Ecosystem, productivity and decomposition; energy flow; pyramids of number, biomass, energy.

Biodiversity and Conservation

Biodiversity - Concept, levels, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.

Syllabus for the post of TGT - Mathematics

Subject specific syllabus includes the concepts of NCERT/CBSE syllabus and Text Books (Classes VI to X), however, the questions will be testing the depth of understanding and application of these concepts at the level of Graduation.

REAL NUMBERS

- Review of representation of natural numbers, integers, and rational numbers on the number line. Rational numbers as recurring/ terminating decimals. Operations on real numbers.
- Examples of non-recurring/non-terminating decimals. Existence of non-rational numbers (irrational numbers) such as $\sqrt{2}$, $\sqrt{3}$, and their representation on the number line. Explaining that every real number is represented by a unique point on the number line and conversely, viz. every point on the number line represents a unique real number.
- Definition of nth root of a real number.
- Rationalization of real numbers of the type $\frac{1}{a+b\sqrt{x}}$ and $\frac{1}{\sqrt{x}+\sqrt{y}}$ their combinations where x and y are natural number and a and b are integers.
- Laws of exponents with integral powers. Rational exponents with positive real bases
- Fundamental Theorem of Arithmetic statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of irrationality of $\sqrt{2}, \sqrt{3}\ \sqrt{5}$

POLYNOMIALS

- Definition of a polynomial in one variable, with examples and counter examples.
- Coefficients of a polynomial, terms of a polynomial and zero polynomial.
- Degree of a polynomial. Constant, linear, quadratic and cubic polynomials. Monomials, binomials, trinomials. Factors and multiples.
- Zeros of a polynomial. Relationship between zeros and coefficients of quadratic polynomials.
- Remainder Theorem with examples, Factor Theorem.
- Factorization of $ax^2 + bx + c$, $a \neq 0$ where a, b and c are real numbers, and of cubic polynomials using the Factor Theorem.
- The algebraic expressions and identities. Verification of identities:
  $(x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2zx$
  $(x \pm y)^3 = x^3 \pm y^3 \pm 3xy\,(x \pm y)$
  $x^3 \pm y^3 = (x \pm y)\,(x^2 \mp xy + y^2$
  $x^3 + y^3 + z^3 - 3xyz = (x + y + z)\,(x^2 + y^2 + z^2 - xy - yz - zx)$ and their use in factorization of polynomials.

LINEAR EQUATIONS IN TWO VARIABLES

Linear equations in one variable.Introduction to the equation in two variables. Focus on linear equations of the type ax + by + c=0.Explain that a linear equation in two variables has infinitely many solutions and justify their being written as ordered pairs of real numbers, plotting them and showing that they lie on a line.

PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Pair of linear equations in two variables and graphical method of their solution, consistency/inconsistency. Algebraic conditions for number of solutions. Solution of a pair of linear equations in two variables algebraically - by substitution, by elimination.Simple situational problems.

QUADRATIC EQUATIONS

Standard form of a quadratic equation ax2 + bx + c = 0, ($a \neq 0$). Solutions of quadratic equations (only real roots) by factorization, and by using quadratic formula. Relationship between discriminant and nature of roots.

ARITHMETIC PROGRESSIONS

Arithmetic Progression, nth term and sum of the first n terms of A.P. and their application in solving daily life problems.

COORDINATE GEOMETRY

The Cartesian plane, coordinates of a point, names and terms associated with the coordinate plane, notations. Graphs of linear equations. Distance formula. Section formula (internal division)

INTRODUCTION TO EUCLID'S GEOMETRY

History - Geometry in India and Euclid's geometry. Euclid's method of formalizing observed phenomenon into rigorous Mathematics with definitions, common/obvious notions, axioms/postulates and theorems. The five postulates of Euclid. Showing the relationship between axiom and theorem, for example: (Axiom) 1. Given two distinct points, there exists one and only one line through them. (Theorem) 2. (Prove) Two distinct lines cannot have more than one point in common.

LINES AND ANGLES

- If a ray stands on a line, then the sum of the two adjacent angles so formed is 180 degrees and the converse.
- If two lines intersect, vertically opposite angles are equal.
- Lines which are parallel to a given line are parallel.

TRIANGLES

- Two triangles are congruent if any two sides and the included angle of one triangle is equal to any two sides and the included angle of the other triangle (SAS Congruence).
- Two triangles are congruent if any two angles and the included side of one triangle is equal to any two angles and the included side of the other triangle (ASA Congruence).
- Two triangles are congruent if the three sides of one triangle are equal to three sides of the other triangle (SSS Congruence).
- Two right triangles are congruent if the hypotenuse and a side of one triangle are equal (respectively) to the hypotenuse and a side of the other triangle. (RHS Congruence)
- The angles opposite to equal sides of a triangle are equal.

- The sides opposite to equal angles of a triangle are equal.
- If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
- If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.
- If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.
- If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.
- If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional, the two triangles are similar.

QUADRILATERALS

- The diagonal divides a parallelogram into two congruent triangles.
- In a parallelogram opposite sides are equal, and conversely.
- In a parallelogram opposite angles are equal, and conversely.
- A quadrilateral is a parallelogram if a pair of its opposite sides is parallel and equal.
- In a parallelogram, the diagonals bisect each other and conversely.
- In a triangle, the line segment joining the mid points of any two sides is parallel to the third side and in half of it and (motivate) its converse.

CIRCLES

- Equal chords of a circle subtend equal angles at the center and (motivate) its converse.
- The perpendicular from the center of a circle to a chord bisects the chord and conversely, the line drawn through the center of a circle to bisect a chord is perpendicular to the chord.
- Equal chords of a circle (or of congruent circles) are equidistant from the center (or their respective centers) and conversely.
- The angle subtended by an arc at the center is double the angle subtended by it at any point on the remaining part of the circle.
- Angles in the same segment of a circle are equal.
- If a line segment joining two points subtends equal angle at two other points lying on the same side of the line containing the segment, the four points lie on a circle.
- The sum of either of the pair of the opposite angles of a cyclic quadrilateral is 180° and its converse.
- Tangent to a circle at, point of contact
- The tangent at any point of a circle is perpendicular to the radius through the point of contact.
- The lengths of tangents drawn from an external point to a circle are equal.

AREAS

Area of a triangle using Heron's formula, Area of sectors and segments of a circle. Problems based on areas and perimeter / circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of 60°, 90° and 120°.

SURFACE AREAS AND VOLUMES

Surface areas and volumes of spheres (including hemispheres) and right circular cones. Surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones

STATISTICS

Bar graphs, histograms (with varying base lengths), and frequency polygons.Mean, median and mode of grouped data

PROBABILITY

Classical definition of probability.Simple problems on finding the probability of an event.

TRIGONOMETRY

Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined); motivate the ratios whichever are defined at 0^0 and 90^0. Values of the trigonometric ratios of 30^0, 45^0 and 60^0.Relationships between the ratios.

TRIGONOMETRIC IDENTITIES

Proof and applications of the identity $\sin^2A + \cos^2A = 1$. Only simple identities to be given.

HEIGHTS AND DISTANCES:

Angle of elevation, Angle of Depression. Simple problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only 30°, 45°, and 60°

Syllabus for the post of TGT– Chemistry

Subject specific syllabus includes the concepts of NCERT/CBSE syllabus and Text Books (Classes VI to X), however, the questions will be testing the depth of understanding and application of these concepts at the level of Graduation.

Basic Concepts of Chemistry: General Introduction: Importance and scope of Chemistry. Nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules. Atomic and molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.

Structure of Atom: Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars. Thomson's model and its limitations. Rutherford's model and its limitations, Bohr's model and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals - Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals.

Classification of Elements and Periodicity in Properties: Significance of classification, brief history of the development of periodic table, modern periodic law and the present form of periodic table, periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100.

Chemical Bonding and Molecular Structure: Valence electrons, ionic bond, covalent bond, bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s, p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only), Hydrogen bond.

Chemical Thermodynamics: Concepts of System and types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions. First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat, measurement of ΔU & ΔH, Hess's law of constant heat summation, enthalpy of bond of dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. Second law of Thermodynamics, Introduction of entropy as a state function, Gibb's energy change for spontaneous and nonspontaneous processes, criteria for equilibrium. Third law of thermodynamics.

Equilibrium: Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium - Le Chatelier's principle, ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength, concept of pH, hydrolysis of salts (elementary idea), buffer solution, Henderson Equation, solubility product, common ion effect (with illustrative examples).

Redox Reactions: Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number, applications of redox reactions.

Organic Chemistry -Some Basic Principles and Techniques: General introduction, methods of purification, qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

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Aromatic Hydrocarbons: Introduction, IUPAC nomenclature, benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution. Nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, directive influence of functional group in monosubstituted benzene. Carcinogenicity and toxicity.

Solutions

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, Raoult's law, colligative properties - relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor.

Electrochemistry

Redox reactions, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell-electrolytic cells and Galvanic cells, lead accumulator, fuel cells, corrosion.

Chemical Kinetics

Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment), activation energy, Arrhenius equation.

d and f Block Elements

General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first-row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$. **Lanthanoids** – Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. **Actinoids** - Electronic configuration, oxidation states and comparison with lanthanoids.

Coordination Compounds

Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT; structure and stereoisomerism, importance of coordination compounds (in qualitative analysis, extraction of metals and biological system).

Haloalkanes and Haloarenes.

Haloalkanes: Nomenclature, nature of C–X bond, physical and chemical properties, optical rotation mechanism of substitution reactions. **Haloarenes:** Nature of C–X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only). Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

Alcohols, Phenols and Ethers

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses with special reference to methanol and ethanol. **Phenols:** Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols. **Ethers:** Nomenclature, methods of preparation, physical and chemical properties, uses.

Aldehydes, Ketones and Carboxylic Acids

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses. **Carboxylic Acids:** Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Amines

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines. Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.

Biomolecules

Carbohydrates - Classification (aldoses and ketoses), monosaccahrides (glucose and fructose), D-L configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates. **Proteins** -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes. Hormones - Elementary idea excluding structure. **Vitamins** - Classification and functions. Nucleic Acids: DNA and RNA.

Syllabus for the post of TGT - Biology

Subject specific syllabus includes the concepts of NCERT/CBSE syllabus and Text Books (Classes VI to X), however, the questions will be testing the depth of understanding and application of these concepts at the level of Graduation.

The Living World

Biodiversity; Need for classification; three domains of life; taxonomy and systematics; concept of species and taxonomical hierarchy; binomial nomenclature

Biological Classification

Five kingdom classification; Salient features and classification of Monera, Protista and Fungi into major groups; Lichens, Viruses and Viroids.

Plant Kingdom

Classification of plants into major groups; Salient and distinguishing features and a few examples of Algae, Bryophyta, Pteridophyta, Gymnospermae (Topics excluded – Angiosperms, Plant Life Cycle and Alternation of Generations)

Animal Kingdom

Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level (salient features and at a few examples of each category).

Morphology of Flowering Plants

Morphology of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed. Description of families: Solanaceae

Anatomy of Flowering Plants

Anatomy and functions of tissue systems in dicots and monocots.

Structural Organisation in Animals

Morphology, Anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of frog.

Cell-The Unit of Life

Cell theory and cell as the basic unit of life, structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; cell envelope; cell membrane, cell wall; cell organelles - structure and function; endomembrane system- endoplasmic reticulum, ribosomes, golgi bodies, lysosomes, vacuoles; mitochondria, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus.

Biomolecules

Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids; Enzymes - properties, enzyme action.

Cell Cycle and Cell Division

Cell cycle, mitosis, meiosis and their significance

Photosynthesis in Higher Plants

Photosynthesis as a means of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis.

Respiration in Plants

Exchange of gases; cellular respiration - glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations - number of ATP molecules generated; amphibolic pathways; respiratory quotient.

Plant - Growth and Development

Seed germination; phases of plant growth and plant growth rate; conditions for growth; differentiation, dedifferentiation and redifferentiation; sequence of developmental processes in a plant cell; growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA.

Breathing and Exchange of Gases

Introduction to respiratory organs in animals; Respiratory system in humans; mechanism of breathing and its regulation in humans - exchange of gases, transport of gases and regulation of respiration, respiratory volumes; disorders related to respiration - asthma, emphysema, occupational respiratory disorders.

Body Fluids and Circulation

Composition of blood, blood groups, coagulation of blood; composition of lymph and its function; human circulatory system - Structure of human heart and blood vessels; cardiac cycle, cardiac output, ECG; double circulation; regulation of cardiac activity; disorders of circulatory system - hypertension, coronary artery disease, angina pectoris, heart failure.

Excretory Products and their Elimination

Modes of excretion - ammonotelism, ureotelism, uricotelism; human excretory system – structure and function; urine formation, osmoregulation; regulation of kidney function - renin - angiotensin, atrial natriuretic factor, ADH, diabetes insipidus; micturition; role of other organs in excretion; disorders - uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant.

Locomotion and Movement

Types of movement – amoeboid, ciliary, flagellar, muscular; skeletal muscle, contractile proteins and muscle contraction; skeletal system and its functions; joints; disorders of muscular and skeletal systems - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.

Neural Control and Coordination

Neuron and nerves; Nervous system in humans - central nervous system and peripheral nervous system; generation and conduction of nerve impulse; visceral nervous system.

Chemical Coordination and Integration

Endocrine glands and hormones; human endocrine system - hypothalamus, pituitary, pineal, thyroid, parathyroid, thymus, adrenal, pancreas, gonads; hormones of heart, kidney and gastrointestinal tract; mechanism of hormone action (elementary idea); role of hormones as messengers and regulators, hypo - and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goiter, exophthalmic goiter, diabetes, Addison's disease.

Sexual Reproduction in Flowering Plants

Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and embryo, development of seed and formation of fruit; special modes- apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation.

Human Reproduction

Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis - spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation ; parturition ; lactation .

Reproductive Health

Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need and methods; medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT

Principles of Inheritance and Variation

Heredity and variation, Mendelian inheritance; deviations from Mendelism – incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; linkage and crossing over; Sex determination - in human being, birds and honey bee; sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans –thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

Molecular Basis of Inheritance

Structure of DNA and RNA; DNA packaging; Search for genetic material and DNA as genetic 8 material; DNA replication; Central Dogma; transcription, genetic code, translation; gene expression and regulation - lac operon; Human genome project; DNA fingerprinting.

Evolution

Origin of life; biological evolution and evidences for biological evolution (paleontology, comparative anatomy, embryology and molecular evidences); adaptive radiation; Darwin's theory of evolution; mechanism of evolution - variation (mutation and recombination) and natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy - Weinberg's principle; human evolution

Human Health and Diseases

Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

Biotechnology - Principles and Processes

Genetic Engineering (Recombinant DNA Technology).

Biotechnology and its Application

Application of biotechnology in health and agriculture: genetically modified organisms - Bt crops; Human insulin, gene therapy; molecular diagnosis; transgenic animals; biosafety issues, biopiracy and patents.

Organisms and Populations

Population interactions - mutualism, competition, predation, parasitism, commensalism; population attributes - growth, birth rate and death rate, age distribution.

Ecosystem

Ecosystem, productivity and decomposition; energy flow; pyramids of number, biomass, energy.

Biodiversity and Conservation

Biodiversity - Concept, levels, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.

Syllabus for the post of TGT - English

Subject specific syllabus includes the concepts of NCERT/CBSE syllabus and Text Books (Classes VI to X), however, the questions will be testing the depth of understanding and application of these concepts at the level of Graduation.

- 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.
- A pact with the Sun (Supplementary Reader) : A tale of two birds,The Friendly Mongoose,The Shepherd's Treasure, Tansen, The Monkey and the Crocodile,The wonder called sleep,A pact with the Sun.
- 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, Experts Detectives, Mystery of the talking fan,Invention of Vita Work,Dad and the Cat and the Tree,Meadow Surprises,Garden Shake.
- An Alien Hand (Supplementary Reader) : The Tiny Teacher, Bringing up Kari, Golu Grows a nose , Chandni, The Bear story, A Tiger in the House, An Alien Hand
- 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, This is Jody's Fawn, The Duck and the Kangaroo, A visit to Cambridge, A short Monsoon Diary, On the grasshopper and the Cricket.
- How the Camel Got his Hump, Children at Work, The Selfish Giant, The Treasure Within, Princess September, The Fight, Jalebis.
- 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).

पाठ्यक्रम - TGT हिन्दी

विषय -विशेष पाठ्यक्रम में एन सी आर टी / सी बी एस ई पाठ्यक्रम में प्रदत्त एवं कक्षा ६ वीं और १० वीं की पुस्तकों में अंतर्निहित अवधारणा/संकल्पना सम्मिल्लित है, हालाँकि प्रश्नों के माध्यम से उपरोक्त अवधारणाओं और अनुप्रयोगों की स्नातक स्तर की गहन समझ का आकलन किया जाएगा.

खण्ड – क

1. **हिन्दी भाषा और व्याकरण**
2. **वर्णव्यवस्था** -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, विसर्ग 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 (विदेशज), संकर

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

   अर्थ के आधार पर – पर्यायवाची, विलोमार्थी, एकार्थी, अनेकार्थी, श्रुति समभिन्नार्थक शब्द

   शब्द निर्माण - उपसर्ग, प्रत्यय,समास,युग्म शब्द, पुनरुक्त शब्द
6. **पद व्यवस्था** - शब्द और पद

   पद के भेद –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
7. **पद- परिचय** - संज्ञा, सर्वनाम, विशेषण, क्रिया, अव्यय
8. **वाक्य-व्यवस्था** –

   वाक्य के अंग- उद्देश्य, विधेय;

   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

-12**पाठ-बोधन** – अपठित पद्य एवं गद्य

13. **लिखित 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, विज्ञापन लेखन, सूचना लेखन

पाठ्यपुस्तक- वसंत, भाग-1	पाठ्य पुस्तक- वसंत, भाग-2	पाठ्यपुस्तक- वसंत, भाग-3:
1. वहचिड़ियाजो 2. बचपन 3. नादान दोस्त 4. चाँद से थोड़ी सी गप्पें 5. अक्षरों का महत्व 6. पार नज़र के 7. साथी हाथ बढ़ाना 8. ऐसे – ऐसे 9. टिकट अलबम 10.झांसी की रानी 11.जो देखकर भी नहीं देखते 12.संसार पुस्तक है 13.मैं सबसे छोटी होऊँ 14.लोकगीत 15.नौकर 16.वन के मार्ग में 17.साँस-साँस में बांस	1. हम पंछी उन्मुक्त गगन के 2. दादीमाँ 3. हिमालय की बेटियाँ 4. कठपुतली 5. मिठाई वाला 6.रक्त और हमारा शरीर 7. पापा खो गए 8. शाम एक किशान 9.चिड़िया की बच्ची 10. अपूर्व अनुभव 11. रहीम के दोहे 12. कंचा 13. एक तिनका 14. खान पान की बदलती तस्वीर 15. नीलकण्ठ 16. भोर और बरखा 17. वीर कुँवर सिंह 18. संघर्ष के कराण मैं तुनक मिजाज हो गया 19. आश्रम का अनुमानित व्यय 20. विप्लव गायन	1.ध्वनि 2.लाख की चूड़ियाँ 3.बस की यात्रा 4.दीवानों की हस्ती 5.चिट्ठियों की अनूठी दुनिया 6.भगवान के डाकिए 7.क्या निराश हुआ जाए 9.यह सब से कठिन समय नहीं 10.कबीर की साखियाँ 11.कामचोर 12.जब सिनेमा ने बोलना सीखा 13.सुदामा चरित 14.जहाँ पहिया है 15 अकबरी लोटा 16.सूर के पद 17.पानी की कहानी 18.बाज़ और साँप 19.टोपी
पूरक पाठ्य पुस्तक – बाल राम कथा 1. अवध पुरी में राम 2. जंगल और जनकपुर 3. दो वरदान 4. राम का वनगमन 5. चित्रकूट में भरत 6. दंडक वन में दस वर्ष 7. सोने का हिरन 8. सीता की खोज 9. राम और सुग्रीव 10. लंका में हनुमान 11. लंका विजय 12. राम का राज्याभिषेक	**पूरक पाठ्य पुस्तक – बाल महाभारत कथा**	**पूरकपाठ्यपुस्तक - भारतकीखोज** 1. अहमद नगर का किला 2. तलाश 3. सिंधु घाटी सभ्यता 4. युगों का दौर 5. नयी समस्याएँ 6. अंतिम दौर: एक 7. अंतिम दौर: दो 8. तनाव 9. दो पृष्ठ भूमियाँ-भारतीय और अँग्रेजी

पाठ्यपुस्तक- क्षितिजभाग1- 1.दो बैलों की कथा 2.ल्हासा की ओर 3.उपभोक्ता वाद की संस्कृति 4.साँवले सपनों की याद 5.नाना साहब की पुत्री देवी मैना को भस्म कर दियागया 6.प्रेम चंद के फटे जूते 7.मेरे बचपन के दिन 8.एक कुत्ता औ रएक मैना 9.साखियाँ एवं सबद 10.वाख 11.सवैये 12.कैदी और कोकोला 13.ग्रामश्री 14. चंद्र गहना से लौटती बेर 15.मेघ आए 16.यमराज की दिशा 17.बच्चे काम पर जा रहे हैं **पूरक पाठ्य पुस्तक-कृतिका भाग - 1** 1. इस जल प्रलय में 2.मेरे संग की औरतें 3.रीढ़ की हड्डी 4.माटी वाली 5.किस तरह आखिरकार मैं हिन्दी में आया	**पाठ्य पुस्तक- क्षितिज भाग -2** 1.पद- ऊधौ तुम हो अति बड़भागी, मन की मन ही माँझ रही, हमारे हरि हारिल की लकरी, हरि है राजनीति पढ़ि आए 2. राम-लक्ष्मण परशुराम संवाद 3.सवैया - पाँयनिनूपुर ...., कवित्त - डारद्रुमपलना ...., कवित्त - फटकिसिलानि ... 4.आत्मकथ्य 5.उत्साह, अटनहीं रही है 6.यह दंतुरित मुसकान , फसल 7.छाया मत छूना 8.कन्या दान 9.संगतकार 10.नेता जी का चश्मा 11.बाल गोबिन भगत 12.लखनवी अंदाज़ 13.मानवीयकरुणा की दिव्य चमक 14.एक कहानी यह भी 15.स्त्री-शिक्षा के विरोधी कुतर्कों का खंडन 16.नौबतखाने में इबादत 17.संस्कृति **पूरक पाठ्यपुस्तक-कृतिका भाग -2** 1.माता का अँचल; 2.ज़ॉर्ज पंचम की नाक; 3.साना साना हाथ जोड़ि ....; 4.एही ठैंया झुलनी हेरानी हो रामा; 5.मैं क्यों लिखता हूँ।	

Syllabus for the post of TGT - Physical & Health Education

The questions will be testing the depth of understanding and application of the concepts at the level of Graduation.

1. Concept of Physical Education

Meaning and definition of physical educaton its aim and objectives, modern concept and scope of physical education need and importance of physical education , place of physical education in the total education process.

2. Physiological aspects of physical education

Effect of exercise on :

Muscular system, circulatory system , respiratory system , Digestive system

3. Psychological Aspects of Physical Education

Definition of Psychology and sports psychology , achievement and motivation and motivation in sports, sportsmanship and sports ethics

4. Physical Fitness and Wellness

Meaning and importance of physical fitness and wellness, components of physical fitness and wellness , factors affecting physical fitness and wellness , principles of physical fitness development , mean of fitness development , aerobic activities – jogging , cycling calisthenics and Rhythmic exercises, participation in Games and sports , circuit Training.

5. Training Methods

Meaning and concept of training arming up limbering down and their importance methods of training strength Development –Isometric, and Isokinetic Exercises, methods of Endurance Development-Continuous method, Interval Training and Fartlek, Methods of speed Development –Acceleration Runs and pace races.

6. Sociological Aspects of Physical Education

Meaning of sociological and its Importance in physical education and sports. Games and sports as man IS cultural Heritage. Development of leadership qualities and group dynamics.

7. History of the game/sport (anyone game/sport of students choice), latest general rules of the game/sport (anyone game/sport of students choice),measurement of play field and specification of sport equipment, Fundamental skills of the game/port, Related sports terminologies , Important tournaments and venues, sports personalities, sports awards.

8. Health Education

Concepts and objectives of Health Education, Importance of Health Education, Principles of Health Education, Importance of Community participation for health promotion and welfare of individual, family and community.

9. Communicable Diseases

Meaning of communicable Diseases, Essential conditions for communicable Diseases to occur and disease process, common alert signals indicating on set of communicable Diseases , Mode of transmission, common symptoms and prevention of spread (transmission) of AIDS, Hepatitis B and Hepatitis C

10. Contemporary Health Problems

Abuse of alcohol, tobacco and drugs and the effects of abuse on individual, family and community. Effect of alcohol, tobacco and drugs on sportsperson, eating habits that cause obesity and its effect on health of individual

11. Health living

Concept of environment , scope of environment – living environment , work place environment and environment for leisure activities, Essential element of healthful environment - safe water, low level of noise , clean air, sanitary surrounding, low levels of radioactive radiations and absence of hazards responsible for accidents in (i) home and neighborhood n rural and urban areas (ii) school and work place (iii) during leisure time activities recreation and prevention of accidents related to transportation swimming and water sports, Disaster preparedness and health care during disasters.

12. Family Health Education

Meaning and functions of family and its importance as a social institution, needs and problems of adolescents and their management , Human reproduction – menstruation, conceptional and prenated care, problems associated with pre-marital sex and teenage pregnancies , Preparation of marriage, Role of Parents in child care.

13. Prevention and first aid for common sports injuries

Soft Tissue injuries – sprain and strain , Bone Injuries, Joint Injuries.

Subject specific syllabus for PRTs

Direct Recruitment (2022)

Subject specific syllabus includes the concepts of NCERT/CBSE syllabus and Text Books (Classes I - V) as indicated under respective subject headings.

However, the questions will be testing the depth of understanding and application of these concepts at the level of Senior Secondary (upto class XII)

English:

Grammar: Nouns, pronouns, adjectives, adverbs, is, am, are, has, have, tense forms (Simple present and present continuous, simple past and past continuous), expressing future (will and be going to), articles, this, that, these, those (as determiners and empty subjects), question words, an, or, but, punctuation marks (full stop, comma, question mark and inverted commas), possessive adjectives, prepositions

हिन्दी

व्याकरण: संज्ञा, विशेषण और वचन की पहचान और व्यावहारिक प्रयोग, गणित के पाठ्यक्रम पाठ्यक्रम के अनुरूप हिन्दी में संख्याएँ, सनयुक्ताक्षरों की पहचान, पर्याय और विलोम (स्तरानुकूल), सर्वनाम और लिंग की पहचान, विशेषण का संज्ञा के साथ सुसंगत प्रयोग, वचन वचन का प्रयोग, क्रिया, काल और कारक चिन्हों की पहचान, शब्दों के संदर्भ में लिंग का प्रयोग प्रयोग

Mathematics:

Geometry: SHAPES & SPATIAL UNDERSTANDING, SOLIDS AROUND us,
Numbers: DEVELOPING A SENSE OF NUMBERNESS, COUNTING AND OPERATIONS OF NUMBERS, ADDITION AND SUBTRACTION, MULTIPLICATION, DIVISION, MENTAL ARITHMETIC, FRACTIONAL NUMBERS, Money, Measurement, Length, weight, Capacity (Volume), Time, Data Handling, Patterns.

Environmental Science (EVS):

FAMILY AND FRIENDS, FOOD, SHELTER, WATER, TRAVEL, THINGS WE MAKE AND DO