ANNEXURE -A

PART-IV : Syllabus- TGT (Mathematics)

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 , 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 $\sqrt{2}, \sqrt{3}\ \sqrt{5}$

- Number theory, squences and patterns, Triangular Number, Hexagonal Number, square Numbers, Cube Numbers, patterns, Shape sequences, super cells, palindromic patterns. Kaprekar Constant .clock and Calender Number,collatz conjecture Bhramagupta's method of Computation.

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.

MATRICES

R,R2,R3 as vector spaces over R and concept of Rn.Standard basis for each of them. Linear Independence and examples of different bases.Subspaces of R2, R3. Translation, Dilation, Rotation, Reflection in a point, line and plane. Matrix form of basic geometric transformations. Interpretation of eigen values and eigen vectors for such transformations and eigen spaces as invariant subspaces. Matrices in diagonal form. Reduction to diagonal form upto matrices of order 3. Computation of matrix inverses using elementary row operations.Rank of matrix, Solutions of a system of linear equations using matrices

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) Area of Triangle.

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. Area of a Triangle using Hero's formula and its application in finding the area of a quadrilateral.

STATISTICS

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

PROBABILITY

Classical definition of probability. Simple problems on finding the probability of an event. elementary probability and basic law. Discrete and continuous random variable.

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 $\sin^2 A + \cos^2 A = 1$. 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°

CALCULUS.

Sets. Functions and their graphs : polynomial, sine, cosine, exponential and logarithmic functions. Step function, Limits and continuity. Differentiation, Methods of differentiation like Chain rule, Product rule and Quotient rule. Second order derivatives of above functions. Integration as reverse process of differentiation. Integrals of the functions introduced above.

INEQUALITIES

Elementary Inequalities, Absolute value, Inequality of means, Cauchy – Schwarz Inequality, Tchebychef's Inequality.

Motion:

Distance and displacement, velocity; uniform and non-uniform motion along a straight line; acceleration, distance-time and velocity-time graphs for uniform motion and uniformly accelerated motion, elementary idea of uniform circular motion.

Force and Newton's laws :

Force and Motion, Newton's Laws of Motion, Action and Reaction forces, Inertia of a body, Inertia and mass, Momentum, Force and Acceleration.

Gravitation:

Gravitation; Universal Law of Gravitation, Force of Gravitation of the earth (gravity), Acceleration due to Gravity; Mass and Weight; Freefall.

Floatation:

Thrust and Pressure. Archimedes' Principle; Buoyancy.

Work, Energy and Power:

Work done by a Force, Energy, power; Kinetic and Potential energy; Law of conservation of energy).

Sound:

Nature of sound and its propagation in various media, speed of sound, range of hearing in humans; ultra sound; reflection of sound; echo.

Effects of Current

Electric current, potential difference and electric current. Ohm's law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life. Electric power, Interrelation between P, V, I and R.

Magnetic effects of current

Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming's Left Hand Rule, Electric Motor, Electromagnetic induction. Induced potential difference, Induced current. Fleming's Right Hand Rule, Electric Generator, Direct current. Alternating current: frequency of AC. Advantage of AC over DC. Domestic electric circuits.

Natural Phenomena

Reflection of light by curved surfaces; Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required), magnification. Refraction; Laws of refraction, refractive index. Refraction of light by spherical lens; Image formed by spherical lenses; Lens formula (Derivation not required); Magnification. Power of a lens. Functioning of a lens in human eye, defects of vision and their corrections, applications of spherical mirrors and lenses. Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life

SYLLABUS FOR TGT (TELUGU)

PART - II

II. Perspectives in Education

1. **History of Education :**
   - The Education in Ancient India - Pre-Vedic and Post-Vedic period, Medieval Education.
   - Education in Pre Independent era - Woods Despatch (1854), Hunter Commission (1882), Hartog Committee (1929), Sargent Committee (1944).
   - Education in Post Independent era - Mudaliar Commission (1952-53), Kothari Commission (1964-66), Ishwarbhai Patel committee (1977), NPE-1986, POA-1992
2. **Teacher Empowerment:**
   - Need, interventions for empowerment, Professional code of conduct for teachers, Teacher motivation, Professional development of Teachers and Teacher organizations, National / State Level Organizations for Teacher Education, Maintenance of Records and Registers in Schools.
3. **Educational Concerns in Contemporary India:**
   - Democracy and Education, Equality, Equity, Quality in Education, Equality of Educational opportunities.
   - Economics of Education, Education as Human Capital, Education and Human Resource Development, Literacy - Saakshar Bharat Mission.
   - Population Education, Gender - Equality, Equity and Empowerment of Women, Urbanization and migration, Life skills.
   - Adolescence Education
   - Value Education – Moral Value and Professional Ethics in Education.
   - Health and Physical Education
   - Inclusive Education - Classroom Management in Inclusive Education
   - Role of Education in view of Liberalization, Privatization and Globalization
   - Programmes and Projects – APPEP, DPEP, Sarva Shiksha Abhiyan, National Programme for Education of Girls at Elementary Level (NPEGEL), Rashtriya Madhyamika Shiksha Abhiyan (RMSA), Rashtriya Avishkar Abhiyan (RAA), KGBVs, Model Schools.
   - Incentives and special provisions – Mid Day Meals, Free Books, Scholarships, Awards, Welfare Hostels, Transportation.
   - Current Trends in Education

4. **Acts / Rights:**
   - Right of Children to Free and Compulsory Education Act - 2009
   - Right to Information Act - 2005
   - Child Rights
   - Human Rights.

5. **National Curriculum Framework - 2005:** Perspectives, Guiding Principles, Learning and Knowledge, Teaching Learning Process, Assessments, Systemic Reforms.

6. **National Education Policy-2020**

Classroom implications of Educational Psychology

1. **Individual differences:** Inter and intra individual differences, meaning, nature and theories of intelligence with special emphasis to multiple intelligence, IQ, assessment of intelligence, EQ, Creativity. Attitude, Aptitude, Interest, Habit and its Influence on Intelligence – Class room implementation.
2. **Learning:** Theories and approaches of learning, learning curves, Factors, Phases, Dimensions of learning, Types of learning, Transfer of learning. Memory, Forgetting, Learning and assessment– Class room implementation.
3. **Personality:** Nature, characteristics and theories of personality, factors of Personality, Assessment of Personality, Mental health, Adjustment, Stress – nature, Symptoms and management. Emotional intelligence, Management of emotions – Class room implementation.

PART-III : భాషాభోధన శాస్త్రం - తెలుగు

1. భాష : స్వభావం - ఉత్పత్తి ప్రథమ భాష, ద్వితీయ భాష, తృతీయ భాష; మాతృభాష; వివిధ వర్గాలు, వృత్తులవారి భాష.
2. భాషా బోధన మరియు అభ్యసనం : ఉద్దేశాలు, లక్ష్యాలు, అభ్యసన ప్రమాణాలు (సామర్థ్యాలు), విలువలు.
3. బాలబాలికల వికాసము : భాషాభోదన అభ్యసన మనో విజ్ఞానము - ముఖ్యభావనలు: పిల్లల భాషా సంపాదనా సిద్ధాంతాలు: భాష - ఆలోచన, సృజనాత్మకత.
4. భాషా విద్యా ప్రణాళిక : నిర్మాణం, వ్యవస్థీకరణము, అభివృధి, పాఠ్యపుస్తకాల కూర్పు.
5. భాషా నైపుణ్యాలు మరియు భోధన నైపుణ్యాలు : తరగతిలో ప్రతిభాయుత భోధన అభ్యసన ప్రణాళిక రచన, నిర్వహణ; అభ్యసనానుభవాల కల్పన.
6. భాషా భోధన : పద్ధతులు, వ్యూహాలు (పాఠశాల స్థాయి పాఠ్యాంశాలను దృష్టియందుంచుకొని) గద్యం - పద్యం - నాటిక (సంభాషణ), కథ - వ్యాసం మొదలగు ప్రక్రియల భోధన.
7. భోధన మరియు అభ్యసన వనరులు : భాషా భోధన సామగ్రి ఆకృతీకరణ; భాషా ప్రయోగశాల; భోధనోపకరణాలు; ఒక వనరుగా పాఠ్యపుస్తకం; భాష భోధన అభ్యసనాల్లో కంప్యూటర్ సాంకేతికత (ICT) వినియోగం; సహపాఠ్య కార్యక్రమాలు.
8. భాషా విషయక మాపనము - మూల్యాంకనము : నిరంతర సమగ్ర మూల్యాంకనము - మూల్యాంకనా సాధనాలు - వ్యూహాలు, ఉపలబ్ధి మరియు లోప నిర్ధారణనికషలు.
9. అభ్యసన వైకల్యాలు - ప్రత్యేక అవసరాలు గల పిల్లల భాషాభ్యసనం.
10. నిత్య జీవితంలో భాషా వినియోగం - భాష సమస్యలు, భాషావిధానాలు మరియు జాతీయ, రాష్ట్రస్థాయి విద్యా ప్రణాళికా చట్రాలు (పాఠశాల స్థాయి).

PART-IV : తెలుగు భాషా సాహిత్యాలు

(Telugu Language & Literature)

విషయ ప్రణాళిక

1 కవులు, రచయితలు, రచనలు; బిరుదులు - పురస్కారాలు: ఇతివృత్తాలు, సందర్భ నేపధ్యాలు - పాత్రలు, విశేషాంశాలు

2 సాహిత్య ప్రక్రియలు - నిర్వచనాలు - లక్షణాలు

A. పద్య ప్రక్రియలు :- ఇతిహాసం - పురాణం - ప్రబంధం, కావ్యం (ఖండకావ్యం) శతకం - గేయం - ఆశువు (అవధానం) మొదలైనవి

B. రూపక ప్రక్రియలు- నాటకం /నాటిక, యక్షగానం, బుర్రకథ %--% సంభాషణ, మొదలైనవి

3. సాహిత్య ప్రక్రియలు - నిర్వచనాలు - లక్షణాలు, వచన (గద్య) ప్రక్రియలు -కథ /కథానిక/ గల్పిక, నవల /నవలిక, లేఖ, వ్యాసం, జీవితచరిత్ర, ఆత్మకథ (స్వీయచరిత్ర), యాత్రాచరిత్ర,పీఠిక - విమర్శ - సమీక్ష- వచన కవిత - నిబద్ధ కవిత (ఉదా:నానీలు, గజళ్ళు - రుబాయీలు)అనిబద్ధ వచన కవిత సంపాదకీయం, వార్త, వ్యాఖ్య, మొదలైనవి.

4. ఆధునిక సాహిత్యం - ధోరణులు - ఉద్యమాలు: భావ కవిత్వం, అభ్యుదయ కవిత్వం, విప్లవ కవిత్వం, దిగంబర కవిత్వం, స్త్రీవాద కవిత్వం, మైనారిటీ వాద కవిత్వం అనుభూతివాద కవిత్వం, జాతీయోద్యమ కవిత్వం, ఆంధ్రోద్యమ కవిత్వం, తెలంగాణ ఉద్యమ కవిత్వం.

5. తెలుగు భాషా సాహిత్యాలపై ఇతర భాషల ప్రభావం

అ). సంస్కృతం, ఆంగ్లం - ఉర్దు - పారశీకం మొదలైనవి

ఆ). భాషా శాస్త్రం ఆవిర్భావ వికాసాలు మౌళిక భావనలు

6. భాషా రూపాలు :

శాసన భాష, గ్రాంథికభాష, వ్యవహారిక భాష, మాండలిక భాష, ప్రామాణిక భాష, ప్రసారమాధ్యమాల భాష, వైయక్తిక భాష , ఇంటి (కుటుంబ) భాష, పరిసరాల భాష, భాషా వినియోగ సందర్భాలు, భాషా ప్రాధాన్యత, తెలుగు భాషా ప్రాచీనత, భాషా పరి రక్షణ, అభివృద్ధి చర్యలు, భాషా పరి రక్షణ , అభివృద్ధి సంస్థలు.

7. భాషాంశాలు భాషోచ్చారణ, ధ్వని, ధ్వన్యుత్పత్తి స్థానాలు, అక్షరం, లిపి, లిపిపరిణామం: పదం, ప్రాతిపదిక, ప్రత్యయం: అర్థం - అర్థ విపరిణామం, తత్సమం, తద్భవం, దేశ్యం, గ్రామ్యం -అన్యదేశ్యం నానార్థాలు, పర్యాయ పదాలు, వ్యుత్పత్యర్థాలు, ప్రకృతి, వికృతులు, వాక్యం వాక్యబేదాలు- తెలుగు వాక్యం ప్రత్యేకతలు, సంధులు, సమాసాలు, ఛందస్సు అలంకారాలు, వ్యాకరణ పరిభాష.

8. జానపద సాహిత్యం

9. పఠనావగాహనం (గద్యం)

10. పఠనావగాహనం (పద్యం)

Matter-Nature and Behaviour

Gases, liquids, solids, plasma and Bose-Enstein condenstate, types of intermolecular forces. Classification of matter into mixtures and pure substances. Henry's Law. Concentration of solutions. Colloids-phases of colloids, Tyndall effect, Brownian movement. Suspension.
Properties of matter. Measurement of properties of matter-S.I. system of units, physical and chemical changes Laws of chemical combination
Gay Lussac's law, Avogadro law, atomic and molecular masses, average atomic mass, mole concept and molar masses, percentage composition.

Nature of matter:

Elements, compounds and mixtures. Heterogeneous and homogenous mixtures, colloids and suspensions. Physical and chemical changes (excluding separating the components of a mixture).

Particle nature and their basic units:

Atoms and molecules, Law of Chemical Combination, Chemical formula of common compounds, Atomic and molecular masses.

Structure of atoms:

Electrons, protons and neutrons, Valency, Atomic Number and Mass Number, Isotopes and Isobars, Discharge tube experiments.

Chemical reactions:

Chemical equation, Balanced chemical equation, implications of a balanced chemical equation, types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, endothermic exothermic reactions, oxidation and reduction.

Acids, bases and salts:

Their definitions in terms of furnishing of H+ and OH– ions, General properties examples and uses, neutralization, concept of pH scale Numericals ,
Importance of pH in everyday life; preparation and uses of Sodium Hydroxide, Bleaching powder, Baking soda, Washing soda and Plaster of Paris.

Metals and non metals:

Properties of metals and non-metals; Reactivity series; Formation and properties of ionic compounds; Basic metallurgical processes; Corrosion and its prevention.

Carbon compounds:

Covalent bonding in carbon compounds. Versatile nature of carbon. Homologous series. , difference between saturated hydro carbons and unsaturated hydrocarbons. Chemical properties of carbon compounds Alcohols: Preparation and properties. Qualitative analysis of alcohols, iodoform test, effect of alcohols on living beings.
Carboxylicacids: Preparation and properties.
, soaps and detergents. Concept of hybridization and shapes of molecules structural formula and molecular models. isomerism, IUPAC nomenclature of organic compounds.

Periodic Classification of Elements

Mendeleev's periodic law, Periodic properties of elements, trends in the periods and groups: Improtance of the periodic table, position of hydrogen in the periodic table.

Tissues, Organs, Organ System, Organism:

Structure and functions of animal and plant tissues (only four types of tissues in animals;

Meristematic and Permanent tissues in plants).

Life processes:

'Living Being'. Basic concept of nutrition, respiration, transport and excretion in plants and animals.

Control and co-ordination in animals and plants:

Tropic movements in plants; Introduction of plant hormones; Control and co-ordination in animals: Nervous system; Voluntary, involuntary and re-flexaction; Chemical co- ordination: animal hormones.

Reproduction:

Reproduction in animals and plants (asexual and sexual) reproductive health – need and methods of family planning . Safe sex vs HIV/AIDS. Child bearing and women's health.

Heredity and Evolution:

Heredity; Mendel's contribution-Laws for inheritance of traits: Sex determination: brief introduction evolution. - Acquired and inherited traits., Homologus and Analogous organs. , What are fossils?.

Cell - Basic Unit of life :

Cell as a basic unit of life; prokaryotic and eukaryotic cells, multi cellular organisms; cell membrane and cell wall, cell organelles and cell inclusions; chloroplast, mitochondria, vacuoles, endoplasmic reticulum, Golgi apparatus; nucleus, chromosomes – basic structure, number.

Motion:

Distance and displacement, velocity; uniform and non-uniform motion along a straight line; acceleration, distance-time and velocity-time graphs for uniform motion and uniformly accelerated motion, elementary idea of uniform circular motion.

Force and Newton's laws :

Force and Motion, Newton's Laws of Motion, Action and Reaction forces, Inertia of a body, Inertia and mass, Momentum, Force and Acceleration.

Gravitation:

Gravitation; Universal Law of Gravitation, Force of Gravitation of the earth (gravity), Acceleration due to Gravity; Mass and Weight; Freefall.

Floatation:

Thrust and Pressure. Archimedes' Principle; Buoyancy.

Work, Energy and Power:

Work done by a Force, Energy, power; Kinetic and Potential energy; Law of conservation of energy).

Sound:

Nature of sound and its propagation in various media, speed of sound, range of hearing in humans; ultra sound; reflection of sound; echo.

Effects of Current

Electric current, potential difference and electric current. Ohm's law; Resistance, Resistivity,

Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life. Electric power, Interrelation between P, V, I and R.

Magnetic effects of current

Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming's Left Hand Rule, Electric Motor, Electromagnetic induction. Induced potential difference, Induced current. Fleming's Right Hand Rule, Electric Generator, Direct current. Alternating current: frequency of AC. Advantage of AC over DC. Domestic electric circuits.

Food Production

Plant and animal breeding and selection for quality improvement and management; Use of fertilizers and manures; Protection from pests and diseases; Organic farming.

Natural Phenomena

Reflection of light by curved surfaces; Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required), magnification. Refraction; Laws of refraction, refractive index. Refraction of light by spherical lens; Image formed by spherical lenses; Lens formula (Derivation not required); Magnification. Power of a lens. Functioning of a lens in human eye, defects of vision and their corrections, applications of spherical mirrors and lenses. Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life

Our environment:

Eco-system, Environmental problems, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable substances.
Global warming and green house effect, acid rain, particulate pollutants, smog, formation of photochemical smog.
Water pollution-oxygen demand, chemical oxygen demand, international standard of drinking water, processing of drinking water.

Diversity of living organisms

- Basis of Classification.
- Classification & Evolution.
- Hierarchy of classification–groups.
- Plantae, Animalia.
- Nomenclature

Why do we fall ill

- Health & its failure.
- Diseases and their causes
- Types of diseases- Infectious, Noninfectious.
- Prevention of diseases
- Smmunisation

PART-IV : Syllabus - TGT (Work Experience)

(1) Circuit Fundamentals

Zero Reference Level - Chassis Ground - Ohm's Law - Formula Variations of Ohm's Law - Graphical Representation of Ohm's Law - Linear Resistor - Non-linear Resistor - Cells in Series and Parallel - Conventional Problems

(2) Resistive Circuits

Series Circuit - Characteristics of a Series Circuit - The Case of Zero IR Drop - Polarity of IR Drops - Total Power - Series Aiding and Series Opposing Voltages - Proportional Voltage Formula in a Series Circuit Series Voltage Dividers - 'Opens in a Series Circuit - 'Shorts' in e Series Circuit - Parallel Circuits - Laws of Parallel Circuits Special Case of Equal Resistances in all Branches - Special Case of Only Two Branches Any Branch Resistance - Proportional Current Formula - 'Opens' in a Parallel Circuit - 'Shorts' in a Parallel Circuit - Series-Parallel Circuits Analyzing Series Parallel Circuits - 'Opens' in Series-Parallel Circuits 'Shorts' in SeriesParallel Circuits - Voltage Division in a Complex Series-Parallel Circuit - Conventional Problems

(3) Kirchhoff's Laws

General - Kirchhoffs Current Law Kirchhoffs Voltage Law - Determination of Algebraic Sign - Assumed Direction of Current Flow - Conventional Problems.

(4) Network Theorems

General - Superposition Theorem - Ideal Constant-Voltage Source - Ideal Constant-current Source - Thevenin's Theorem - How to Thevenize a Circuit? - Norton's Theorem - How to Nortonise a Given Circuit - Maximum Power Transfer Theorem - Conventional Problems

(5) Passive Circuit Elements

General - Resistors - Resistor Types - Wire-wound Resistors - Carbon Composition Resistors - Carbon Film Resistors - Cermet Film Resistors .Metal Film Resistors - Power Rating - Value Tolerance - Variable Resistors - Potentiometers and Rheostats - Fusible Resistors - Resistor Colour Code - Resistance Colour Bands - Resistors under Ten Ohm - Resistor Troubles - Checking Resistors with an Ohmmeter - Inductor - Comparison of Different Cores - Inductance of an Inductor - Another Definition of Inductance - Mutual Inductance - Coefficient of Coupling - Variable Inductors - Inductors in Series or Parallel without M - Series Combination with N - Stray Inductance - Energy Inductance - Energy Stored in a Magnetic Field - DC Resistance of a Coil - Troubles in Coils - Reactance Offered by a Coil - Impedance Offered by a Coil - Q-Factor of a Coil - Capacitors - Capacitor Connected to a Battery –Capacitance-Factors Controlling Capacitance '- Types of Capacitors - Fixed Capacitors - Variable Capacitors - Voltage Rating of Capacitors - Stray Circuit Capacitance Leakage Resistance - Capacitors in Series - Two Capacitors in Series Capacitor's in Parallel - Two Capacitors in Parallel - Energy stored in e Capacitor - Troubles in Capacitors - Checking Capacitors with Ohmmeter - Charging of a Capacitor - Capacitor Connected Across an AC Source Capacitive Reactance

(6) Energy Sources

Primary and Secondary Cells - Cell and Battery - Voltage and Current of a Cells - Cell life - Different Types of Dry Cells - Carbon Zinc Cell Alkaline Cell - Manganese Alkaline Cell – NickelCadmium Cell - Mercury Cell - Silver Oxide Cell - Lead Cells - Battery Rating - Testing Dry Cells - Photoelectric Devices - Photovoltaic Cell - Solar Cell Conventional Problems

(7) Magnetism and Electromagnetism

Magnetic Materials- Ferrites - Types of Magnets - Demagnetizing or Degaussing -Magnetic Shielding - Magnetic Terms and Units - Ohm's Law for Magnetic Circuit - Transformer - Transformer Working - Transformer Impedance
- Can a Transformer Operate on DC ? - RF Shielding - Autotransformer - Impedance Matching - Conventional Problems.

(8) A.C. Fundamentals ;

Introduction - Types of Alternating Waveforms - The Basic AC Generator -Some Definitions - Characteristics of a Sine Wave - Audio an ,Radio Frequencies - Different Values of Sinusoidal Voltage and Current - Phase of an AC - Phase Difference - Vector Representation of an Alternating Quantity - AC Through Pure Resistance Only • AC Through Pure Inductance Only - AC Through Pure Capacitance Only - Non-sinusoidal Waveforms - Harmonics -Conventional Problems

(9) Series A.C. Circuits

R-L Circuit - Q Factor of a Coil - Skin Effect - IR•C Circuit - Coupling Capacitor - R-L-C Circuit - Resonance in an R-L- C Circuit - Resonance Curve - Main Characteristics of Series Resonance - Bandwidth of a Tuned Circuit - Sharpness of Resonance - Tuning - Tuning Ratio - RaGio Tuning Dial-Parallel Resonance -Convectional Problem

(10) **Time Constant**

Rise and Fall of Current In pure Resistance - Time :Constant at an R-L Circuit • Circuit Conditions - Inductive Kick - Time Constant of an RC circuit - Charging and Discharging of a Capacitor Decreasing Time Constant - Flasher -: Puke Response of an RC Circuit - Effect of Large and Short Time Constants - Square voltage Wave Applied to Short A. RC Circuit - Square Voltage Wave Applied to Long A,'E.0 circuit - Conventional Problems

(11) Timing Circuits and Filters

What-is. a Tuning Circuit ? - Tuned Circuit - Operating Characteristics of a Tuning Circuit - Resonance - Actual Series Resonance - Is it Series or Parallel Resonance ? - Tuned Transformers - Double Tuned Transformers - Parallel Circuit - Coupled Circuits – Simple Coupled Circuits - Coefficient of Coupling - Filters Filter Definitions - Types of Filter Circuits - Low-pass Filter – High pass Filter - Bandpass Filter – Band stop Filter - Multisection Filter Circuits - Uses of Fitters - Conventional Problems

(12) Solid State Physics

Definition of Matter - Crystalline Solids - Unit Cell - arms of Matter - Atom and Molecule - Atomic Structure - Atomic Number (Z) Atomic mass Number (A) - Electron Orbits or shells - Electron Distribution of Different Atoms Electron Sub orbits or Subshells - Valence Electrons Orbital Energy. - Normal, Excited and IonizedAtom. - Orbital Energies in hyrogen Atom - Energy Levels in an Isolated At W- Energy Bands in Solids - Bonds in Solids - Valence and Conduction Bands - Conduction in Solids - Hole Formation and its Movement Conductors, Semiconductors and Insulators - Types of Semiconductors - Intrinsic Semiconductors Extrinsic Semiconductors - Majority and Minority Charge Carriers - Mobile Charge Carriers and Immobile Torts - Drift Current in Good Conductors Drift Current in Intrinsic Semiconductors - Intrinsic Conduction -Conventional Problems

(13) The P-N Junction

The P-N Junction - Formation of Depletion Layer Junction or Barrier Voltage (V B) - Effect of Temperature on Barrier Voltage - Forward Biased P-N Junction - Forward VII Characteristics - Reverse Biased P-N Junction - ReMerse Saturation Current (Is or 1_0) - Reverse V/ I Characteristic Combined Forward and Reverse VII Characteristics - Junction Breakdown - Junction Capacitance

(14) P-N Junction Diode

P-N Junction Diode - Diode Ratings or Specifications - Diode Testing The Ideal Diode -The Real Diode - Diode Circuits with DC and A Voltage Sources - Diode Fabrication- Grown Junction - Alloy Junction Diffused Junction Epitaxial Junction - Point ContactJunction - Clippers and Campers - Clippers - Some Clipping Circuits - Clampers

Summary of Clamping Circuits - Conventional Problems Questions.

(15) Special Diode's I

Zener Diode - Voltage Regulation Zener Diode as Peak Clipper - Meter Protection – Tunneling Effect - Tunnel Diode

- Tunnel Diode Oscillator Varactor - PIN Diode - Schottky Diode - Step Recovery Diode Thermistors -Conventional Problems

(16) Optoelectronic Devices

Light Emitting Diode (LED) - Photoemissive Devices - Photomultiplier Tube - Photovoltaic Devices - Bulk Type Photoconductive Cells - Photodiodes -P-N Junction Photodiode - PIN Photodiode - Avalanche Photodiode

(17) DC Power Supplies'

Introduction - Unregulated Power Supply - Regulated Power Supply Steady and Pulsating DC Voltages - Rectifiers Half-wave Rectifier Full-wave Rectifier - Full-wave Bridge Rectifier - Filters - Series Inductor Filter - Shunt Capacitor Filter - Effect of Increasing Filter Capacitance - LC Filter - The CLC or Pi Filter - Bleeder Resistor - Voltage Regulation Zener Diode Shunt Regulator - Transistor, Series Voltage Regulator - Controlled Transistor Series Regulator - Transistor Shunt Voltage Regulator Transistor Current Regulator - Voltage Dividers - Complete Power Supply - Voltage Multipliers - Half-wave Voltage Doubler - Full-wave Voltage Doubler - Voltage Tripler and Quadrupler Circuits - Troubleshooting Power Supplies - Controlled Rectification - Output Waveforms for Different Firing Angles - Output Voltage and Current Values in Controlled Rectifiers Average Values for FW Controlled Rectifier - Silicon Controlled Rectifier (SCR) - Pulse Control of SCR - 90° Phas- Control of SCR - 180^{0} Phase Contr,gi of SCR - SCR Controlled Circuit - U3T Controlled Circuit Conventional Problems

(18) The Basic Transistor

The Bipolar Junction Transistor - Transistor Biasing -Important Biasing Rule - Transistor Currents - Summing Up - Transistor Circuit Configurations - CB Configuration - CE Configuration -Relations between a and 13 - CC Configuration -

Relations between Transistor Currents - Leakage Currents in a Transistor - Thermal Runaway - Conventional Problems

(19) Transistor Characteristics and Approximations

Transistor Static Characteristics - Common Base Test Circuit - Common Base Static - Characteristics - Common Emitter Test Circuit - Common Emitter Static Characteristics - Common Collector Static Characteristics - Different Ways of Drawing 'Transistor Circuits - Common Base Formulas Common Emitter Formulas - Common Collector Formulas - The Beta Rule - Importance of V_{ce}- Cut-off and Saturation Points - Normal DC Voltage Transistor Indications - Transistor Fault Location - Solving Universal Stabilization Circuit

- Notation for Voltages and Currents - Increase / Decrease Notation - Applying AC to a DC Biased Transistor
- Transistor *AC/DC*

Analysis -Conventional problems

(20)Load Lines and DC Bias Circuits

DC Load Line - Q-point and Maximum Undistorted Output - Need for Biasing a Transistor - Factors Affecting Bias Variations - Stability; Factor - Beta Sensitivity - Stability Factor for CB and OF Circuits - Different Methods for Transistor BiaSing - Base Bias - Base Bias with Emitter Feedback - Bate Bias with Collector Feedback - Base Bias with Collector and Emitter Feedbacks - Voltage Divider Bias - Load Line and Output Characteristics - AC Lmid Line - Conventional Problems'

(21) Transistor Equivalent Circuits and Mode

General DC Equivalent Circuit - AC Equivalent Circuit -equivalent Circuit of a CB Amplifier -Effect of Source Resistance RS on Voltage Gain - Equivalent circuit of a CE Amplifier – Effect of Source Resistance RS - Equivalent Circuit of a CC Amplifier -Low-frequency Model or Representation - Genera; - T-Model - Formulas for T- Equivalent of a CB Circuit - Equivalent of a CB Circuit - T-Equivalent of a CE Circuit What are h-parameters ? - The h-parameter Formulas for Notation for Transistors - The h-parameters of an Ideal Transistor -, The h-parameters of an Ideal CB Transistor - The h-parameters of an Idal CE, Transistor - Approximate Hybrid Equivalent Circuits Typical Values of Transistor h-parameters - Hybrid Formulas for Transistor Amplifier - Approximate Hybrid Formulas -Conventional Problems

(22) Single- Stage Transistor Amplifiers

Classification of Amplifiers – Common Base (CB) Amplifier – Various Glans of a CB Amplifier- Characteristics of a CB Amplifier – Characteristics of a CE Amplifier – Common Collector (CC) Amplifier – Various Gains of a CC Amplifier – Characteristics of a CC Amplifier – Uses – Comparison of Amplifier Configurations –Amplifier Classification Based on Biasing Condition – Graphic Representation Class A Amplifiers – Power Distribution in a class A Amplifier – Power Rectangle – Power Efficiency Maximum AC Power in Load – Transformer-coupled, Class A Amplifier Class B Amplifier- Power Relations for Class B Operation – Maximum Values- Class –B Push –Pull Amplifier- Crossover Distortion – Power Efficiency of Push-Pull Amplifiers – Complementary Symmetry Push-Pull Class-B Amplifier – Class C Amplifier- Tuned Amplifier – Distortion in Amplifier – Non-linear Distortion-

Intermodulation Distortion- Frequency Distortion – Phase or Delay Distortion – Noise

(23) Multistage Amplifiers

General '--- Amplifier Coupling- RC-Coupled Two stage Amplifier – Advantages of RC Coupling } Impedance- Coupled Two –stage Amplifier- Advantages of Impedance Coupling – Transformer – coupled Two Stage Amplifier – Advantages of Transformer Cupling – Frequency Response – Applications – Direct- coupled Two- stage Amplifier Using Similar Transistors – Direct-coupled Amplifier Using Complementary Symmetry of Two Transistors – Darlington Pair –Advantages of Darlington Pair – Comparison between Darlington Pair and Emitter Follower – Special Features of a Differential Amplifier – Common Model Input – Differential Amplifier – Conventional problems

(24) Decibels and Frequency Response

The Decibel System - Other Expressions for Power Gain - Voltage and Current Levels - Characteristics of the Decibel System - Value of I dB Zero Decibel Reference Level - Variations In Amplifier Gain with Frequency - Changes in Voltage and Power Levels - Causes of Gain Variation.: Miller Effect - Cut-off Frequencies of Cascaded Amplifiers - Transistor Cut-off Frequencies - Alpha Cut-off Frequency - Beta Cut-off :Frequency - The f_t of a Transistor - Relation Between fa,fband f_t Gain-Bandwidth Product - Conventional Problems

(25) Feedback Amplifier

Feedback Amplifiers – Principal of Feedback Amplifiers – Advantages of Negative Feedback – Gain Stability – Decreased Distortion- Increased Bandwidth – Forms of Negative Feedback – Shunt-derived Series-fed Voltage Feedback – Current –Series Feedback Amplifier – Voltage-shunt Negative Feedback Amplifier – Current –shunt Negative Feedback Amplifier –Conventional Problems.

(26) Field Effect Transistor

What is a FET? Junction FET (JEFT) – Static Characteristics of a JFET – JFET Drain Characteristic with V GS = 0 –JFET Characteristic with External Bias – Transfer Characteristic – Small Signal JFET Parameters DC Biasing of a JFET –DC Load Line – Common Source JFET

Amplifier - JEFF on an IC Chip - Advantages of FETs - MOSFET or IGFET DE MOSFET - Schematic Symbols for a DE MOSFET - Static Characteristics of a DE MOSFET - Enhancement only N-channel MOSFET Tr?risfer Characteristic -
FETs as Switches - FET Applications - MOS-FET Handling

(27) Breakdown Device's

What are Breakdown Devices ? Uni junction Transistor - UJT Relaxation Oscillator - Silicon Controlled Rectifier - C10° Phase Control - Theft Alarm - Triac -Diac - Silicon Controlled Switch (SCS)

(28) Sinusoidal Oscillators

What is an Oscillator? - Comparison between an Amplifier and an Oscillator - Classification of Oscillators - Damped an Undamped Oscillations - The Oscillatory Circuit - Frequency of Oscillatory Current - Frequency Stability of an Oscillator - Essentials of a Feedback LC Oscillator - Tuned Base Oscillator - Tuned Collector Oscillator - Tuned Drain Oscillator (FET) - Hartley Oscillator - FET Hartley Oscillator - Colpitts Oscillator - Clapp Oscillator – FETColpitts Oscillator - Crystals - Crystal Controlled Oscillator - Transistor Pierce Crystal Oscillator - FET Pierce Oscillator - Phase Shift Principle - Phase Shift Oscillator - Wien Bridge Oscillator

(29) Non sinusoidal Oscillators

Non sinusoidal Waveforms 't-Classification of Non sinusoidal Oscillators Pulse Definitions - Basic Requirements of a Sawtoo0 Generator -U3T Sawtooth Generator – Muiti vibrators (MV) – Uses of Multi vibrators - Astable Multi vibrator – Mono stable Multi vibrator (MMV) –Bi stable Multi vibrator (BMV) - Schmitt Trigger -Transistor Blocking Oscillator

(30) Modulation and De Modulation

Introduction - What is a Carrier Wave? - Radio Frequency Spectrum Sound - Need for Modulation - Radio Broadcasting - Modulation Methods of Modulation - Amplitude Modulation - Per cent Modulation Upper and Lower Side Frequencies - Upper and Lower Sidebands - Mathematical Analysis of a Modulated Carrier Wave - Power Relations in an AM Wave - Forms of Amplitude Modulation - Generation of SSB - Methods of Amplitude Modulation - Block Diagram of an AM Transmitter - Modulating Amplifier Circuit - Frequency Modulation - Frequency Deviation and Carrier Swing - Modulation Index'-Deviation Ratio - Per cent Modulation - FM Sidebands ;- Modulation index and Number of Sidebands - Mathematical Expression for FM Wave - Demodulation or Detection - Essentials of AM Detection - Diode Detector for AM Signals - Transistor Detectors for AM Signals - FM Detection - Quadrature Detector
- Frequency Conversion - Super heterodyne AM Receiver - FM Receiver - Comparison between AM and FM - The Four Fields of FM - Conventional Problems

(31) Integrated Circuits

Introduction - What is an Integrated Circuit? - Advantages of ICs - Drawbacks of ICs - Scale of Integration - Classification of ICs by Structure Comparison between Different ICs -Classification of ICs by Function Linear Integrated Circuits (UCs) - Digital Integrated Circuits - IC Terminology - How Monolithic ICs are Made? - le Symbols - Fabrication of IC Components
- Complete Monolithic Integrated Circuits - Popular Applications of ICs MOS Integrated Circuits - What is an OP-AMP?
OP-AMP Symbol - Polarity Conventions - Ideal Operational Amplifier - Virtual Ground and Summing Point - Why Vi is Reduced to almost Zero? - OP-AMP Applications - Linear Amplifier - Unity Follower - Adder or Summer - Subtractor -
Integrator - Differentiator - Comparator

(32) Number Systems

Number of Systems -The Decimal Number System - Binary System Binary to Decimal Conversion - Binary Fractions - Double-D add Method - Decimal to Binary Conversion - Shifting the Place Point - Binary Operations - Binary Addition - Binary Subtraction - Complement of a Number - 1 is Complemental Subtraction - 2's Complemental Subtraction - Binary Multiplication - 8i4ry Division - Shifting a Number to Left or Right - Representation of Binary Numbers as Electrical Signals - Octal

Number System - Octal to Decimal Conversion – Decimal to Octal Conversion – Binary to Octal Conversion – Octal to Binary Conversion – Advantages of Octal Number System, Hexadecimal Number System – How to Count beyond F in Hex Number System? --- Binary to Hexadecimal conversion – Hexadecimal to Binary Conversion – Conventional Problems.

(33) Logic Gates

Definition - Positive and Negative Logic - The OR Gate - Equivalent Relay Circuit of an OR Gate - Diode OR Gate - Transistor OR Gate OR Gate Symbolizes Logic Addition - Three Input OR Gate - Exclusive OR Gate - The AND Gate - Equivalent Relay Circuit of an AND Gate. Diode AND Gate — Transistor AND Circuit - AND Gate SymbolizesLogic Multiplication - The NOT Gate - Equivalent Circuits for a NOT Gate The NOT Operation ' Bubbled Gates The NOR Gate
- NOR Gate is a Universal Gate - The NAND Gate - NAND sate is a Universal Gate The XNOR Gate - Logic Gates at a Glance - Adders and Subtractors Half Adder - Full Adder - Parallel Binary Adder - Half Subtractor - Full Subtractor -
Conventional Problems

(34) Boolean Algebra

Introduction - Unique Feature of Boolean Algebra - Lay of Boolean Algebra - Equivalent Switching Circuits - De Morgans Theorems - Duals - Conventional Problems

(35) Logic Families

Main Logic Families Saturated and Non-saturated Logic Circuits - Characteristics of Logic Families - RTL Circuit - DTL Circuit -- '- TTL Circuits -TTL Subfamilies -ECL Circuit —I2L_ Circuit - MOS Family - PMOS Circuit - NMOS,
Circuit - CMOS Circuit

(36) Transducer

What is a Transducer? - Classification of Transducers • Classification based on Electrical Principle Involved - Resistive Position Transducer - Resistive Pressure Transducer –-;-Inductive pressure Transducer - - Capacitive Pressure Transducer - Self-generating Inductive Transducers - Linear Variable Differential Transformer (.VDT) - Piezoelectric Transducer - Strain Gauge Temperature Transducers - Resistance Temperature Detectors - Thermistor - Thermocouples - Ultrasonic Temperature Transducers - photoelectric Transducers - Various Types of Microphones - Carbon Microphone Ribbon Microphone - Moving-Coil (Me) Microphone - Crystal Microphone - Ceramic Microphone - Capacitor Microphone - The Electret Microphone The Loudspeaker

(37) Electronic Instruments

Introduction - Analog and Digital Instruments - Function of Instruments - Electronic versus Electrical Instruments - Essentials of an Electronic Instrument - Measurement Standards - The Basic Meter Movement - Characteristics of Moving Coil Meter Movement - Variations of Basic Meter Movement - Converting Basic Meter to DC Ammeter – Multi range Meter - Measurement of Current - Converting Basic Meter to DC Voltmeter Multi range DC Voltmeter - Loading Effect of a Voltmeter - Ohmmeter The Multimeter - Rectifier Ty e AC Meter Electronic Voltmeters - The Direct Current VTVM - Comparison of VOM and VTVM - Direct Current PET VM - Electronic Voltmeter for Alternating Currents - The Digital Voltmeter (DVM) -Cathode Ray Oscilloscope (CRO) - Cathode Ray Tube (CRT) - Deflection Sensitivity f a CRT - Normal Operation of a CRO Triggered and Non-triggered Scopes - Dual Trace CRO - Dual Beam CRO - Storage Oscilloscope - Sampling CRO - Digital Readout CRO - Lissajous Figures - Frequency Determination with Lissajous Figures - Applications of a CRO

PART-IV : **Syllabus – PRT**

Comprehension

Three or four unseen passages from different genres (prose, poetry, drama, articles, editorials, scientific, and literary extracts).
Questions will test comprehension, inference, vocabulary, tone, rhetorical devices, and logical sequencing.

Writing Ability

Functional Writing:

Formal and Informal Letters: Business letters, job applications, letters to editors, complaints, and personal letters.
Report Writing: Factual description of events, newspaper reports, and analytical reports. Notices, Circulars, and Press Releases.

Grammar and Usage

Parts of Speech: Nouns, Pronouns, Verbs, Adverbs, Adjectives, Prepositions, Conjunctions.

Sentence Structure : Types of sentences, subject-verb agreement, parallelism, and sentence connectors.
Tenses and Their Usage: Active-passive voice, sequence of tenses, and reported speech. Clauses: Noun, adjective, and adverb clauses.
Common Errors: Articles, prepositions, modifiers, redundancy, and word order. Editing and Proofreading: Error detection, sentence correction, and transformation.
1- **हिन्दी साहित्य का इतिहास** 2-**गद्य साहित्य की विधाए कहानी**, **निबन्ध**, **जीवनी**, **आत्मकथा**, **रिपोर्ट।** 3- **अपठित गद्यांश**, **पद्यांश ।** 4- **प्रसिद्ध मुहावरे और लोकोक्तियाँ**
व्याकरणः संज्ञा, **विशेषण** ,**वचन और व्यावहारिक प्रयोग**, **गणित के पाठ्यक्रम**, **पाठ्यक्रम के अनुरूप हिन्दी में संख्याएँ**, **संयुक्त अक्षर 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 ,** **संधि** , **संधि विच्छेद** , **पर्यायवाची शब्द**

Geometry: Shapes & Spatial Understanding, Solids around us.
Numbers: Developing a Sense of Numbers, Counting and Operations of Numbers, Addition and Subtraction, Multiplication, Division, Mental Arithmetic, Fractional Numbers, Money, Measurement and units , Length, Weight, Capacity (Volume), Time, Patterns, LCM, HCF , Mensuration, Area & Volume , Perimeter, Distance time & Speed , Profit & Loss, Percentage & Raito , Average, Lines and angles , Circle ,Triangles, Stastics/Data Handeling
Family, Friends and Communities, Natural Resources, Understanding the Environment and Environmental Impact, Life Around Us, Gifts of Nature. Food, Shelter, Water, Travel, Things we make and do. Physiological processes in Plants, Animals and Human Being. Weather, Climate , Landforms of India,Cultural Heritage and Traditions , Governance and Democracy, Constitution of India, Indus valley Civilization ,Gupta Era , Resources of India, Magnets, Materials, Methods of separation .
Visual Art: Objects and Still life art , Colours ,Paper Crafts, Seals and Prints,Local art forms of state.
Yoga , Physical and motor fitness,Diet and Health, First Aid and Safety, Ethics in Sports, Fundamental skill of games- Badminton, Football, Kabaddi, Handball , Kho Kho , cricket ,Hockey . Local games of various states.