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)

पठन कौशल, शब्द सामर्थ्य, व्याकरण एवं प्रयुक्ति

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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Professional Competency Test:

The Professional Competency Test is of 60 marks (Demo Teaching -30 marks and Interview -30 Marks)

Note: The weightage of Written Test & Professional Competency Test (Demo Teaching and Interview) will be 70:30. Final merit list will be based on the performance of the candidates in Written Test, Professional Competency Test taken together.

Subject specific syllabus for TGTs

Direct Recruitment (2022)

Subject specific syllabus includes the concepts of NCERT/CBSE syllabus and Text Books (Classes VI to X) 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 Graduation.

- Mathematics
- Science
- Social Science
- English
- Hindi
- Sanskrit

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 √2, √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 $\sin^2 A + \cos^2 A = 1$. 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°

Syllabus for the post of TGT – Science

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.

Matter-Nature and Behaviour

Definition of matter; solid, liquid and gas; characteristics - shape, volume, density; change of state melting (absorption of heat), freezing, evaporation (cooling by evaporation), condensation, sublimation.

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.

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 (Definition relating to logarithm not required), importance of pH in everyday life; preparation and uses of Sodium Hydroxide, Bleaching powder, Baking soda, Washing soda and Plaster of Paris.

Metals and nonmetals:

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. Nomenclature of carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes, alkanes and alkynes), difference between saturated hydro carbons and unsaturated hydrocarbons. Chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction). Ethanol and Ethanoic acid (only properties and uses), soaps and detergents.

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

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 ofplant hormones; Control and co-ordination in animals: Nervous system; Voluntary, involuntary andreflexaction;Chemical co-ordination:animalhormones.

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.

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),AccelerationduetoGravity;Mass andWeight;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.

Syllabus for the post of TGT – Social Science

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.

Events and Processes:

I. The French Revolution:
- French Society During the Late Eighteenth Century
- The Outbreak of the Revolution
- France Abolishes Monarchy and Becomes a Republic
- Did Women have a Revolution?
- The Abolition of Slavery
- The Revolution and Everyday Life

II. Socialismin Europe and the Russian Revolution:
- The Age of Social Change
- The Russian Revolution
- The February Revolution in Petrograd
- What Changed after October?
- The Global Influence of the Russian Revolution and the USSR

III. Nazism and the Rise of Hitler:
- Birth of theWeimar Republic
- Hitler's Rise to Power
- The Nazi World view
- Youth in Nazi Germany
- Ordinary People and the Crimes Against Humanity

Livelihoods, Economies and Societies:

IV. Forest Society and Colonialism:
- Why Deforestation?
- The Rise of Commercial Forestry
- Rebellion in the Forest
- Forest Transformations in Java

V. Pastoralists in the Modern World:
- Pastoral Nomads and their Movements
- Colonial Rule and Pastoral Life
- Pastoralismin Africa

Contemporary India – I

1. India
- Location
- Size
- India and the World

2. Physical Features of India:

- Major Physiographic Divisions–Himalayan Mountains, Northern Plains, Peninsular Plateau, Indian Desert, Coastal Plains, Islands

3. Drainage:

- Concept
- Drainage Systems in India
- The Himalayan Rivers-Ganga and Brahmaputra River System
- The Peninsular Rivers- Narmada Basin,Tapti Basin, Godavari Basin, Mahanadi Basin, Krishna Basin, Kaveri Basin
- Lakes
- Role of Rivers in the Economy
- River Pollution

4. Climate:

- Concept
- Climatic Controls
- Factors influencing India's climate –Latitude, Altitude, Pressure and Winds
- The Seasons–Cold Weather Season, Hot Weather Season, Advancing Monsoon, Retreating / Post Monsoons
- Distribution of Rainfall
- Monsoon as a unifying bond

5. Natural Vegetation and Wild Life:

- Types of Vegetation–Tropical Evergreen Forests, Tropical Deciduous Forests, Thorn Forests and Shrubs, Montane Forests, Mangrove Forests
- Wild Life

6. Population:

- Population Size and Distribution–India's Population Size and Distribution by Numbers, India's Population Distribution by Density
- Population Growth and Processes of Population Change–Population Growth, Processes of Population Change/Growth

Democratic Politics – I

1. **What is Democracy? Why Democracy?**

- What is Democracy?
- Features of Democracy
- Why Democracy?
- Broader Meanings of Democracy

2. **Constitutional Design:**

- Democratic Constitution in South Africa
- Why do we need a Constitution?
- Making of the Indian Constitution
- Guiding Values of the Indian Constitution

3. **Electoral Politics:**
- Why Elections?
- What is our System of Elections?
- What makes elections in Indiademocratic?

4. **Working of Institutions:**
- How is the major policy decision taken?
- Parliament
- Political Executive
- The Judiciary

5. **Democratic Rights:**
- Life without Rights
- Rights in a Democracy
- Rights in the Indian Constitution
- Expanding scope of rights

Economics

1. **The Story of Village Palampur:**
- Overview
- Organization of Production
- Farming in Palampur
- Non-farm activities in Palampur

2. **People as Resource:**
- Overview
- Economic Activities by Men and Women
- Quality of Population
- Unemployment

3. **Poverty as a Challenge:**
- Overview
- Two typical cases of Poverty
- Poverty as seen by Social Scientists
- Poverty Estimates
- Vulnerable Groups
- Interstate Disparities
- Global Poverty Scenario
- Causes of Poverty
- Anti-Poverty measures
- The Challenges Ahead

4. **Food Security in India:**
- Overview
- What is Food Security?
- Why Food Security?
- Who are food insecure?
- Food Security in India
- What is Buffer Stock?

- What is the Public Distribution System?
- Current Status of Public Distribution System
- Role of Cooperatives in food security

India and the Contemporary World – II

Events and Processes:

1. **The Rise of Nationalism in Europe:**
   - The French Revolution and the Idea of the Nation
   - The Making of Nationalism in Europe
   - The Age of Revolutions: 1830-1848
   - The Making of Germany and Italy
   - Visualizing the Nation
   - Nationalism and Imperialism

2. Nationalism in India:
   - The First World War, Khilafat and Non -
   - Cooperation
   - Differing Strands within the Movement
   - Towards Civil Disobedience
   - The Sense of Collective Belonging

Livelihoods, Economies and Societies:

3. **The Making of a Global World:**
   - The Pre-modern world
   - The Nineteenth Century (1815-1914)
   - The Inter war Economy
   - Rebuilding a World Economy: The Post-War Era

4. **The Age of Industrialization**:

   - Before the Industrial Revolution
   - Hand Labour and Steam Power
   - Industrialization in the Colonies
   - Factories Come Up
   - The Peculiarities of Industrial Growth
   - Market for Goods

Everyday Life, Culture and Politics:

5. **Print Culture and the Modern World:**
   - The First Printed Books
   - Print Comes to Europe
   - The Print Revolution and its Impact
   - The Reading Mania
   - The Nineteenth Century
   - India and the World of Print
   - Religious Reform and Public Debates
   - New Forms of Publication
   - Print and Censorship

Contemporary India – II

1. **Resources and Development:**
   - Concept
   - Development of Resources
   - Resource Planning – Resource Planning in India, Conservation of Resources
   - Land Resources
   - Land Utilization
   - Land Use Pattern in India
   - Land Degradation and Conservation Measures
   - Soil as a Resource - Classification of Soils, Soil Erosion and Soil Conservation

2. **Forest and Wildlife**
   - Conservation of forest and wildlife in India
   - Types and distribution of forests and wildlife resources
   - Community and Conservation

3. **Water Resources:**
   - Water Scarcity and The Need for Water Conservation and Management
   - Multi-Purpose River Projects and Integrated Water Resources Management
   - Rainwater Harvesting

4. **Agriculture:**
   - Types of Farming – Primitive Subsistence, Intensive Subsistence,
   - Commercial
   - Cropping Pattern – Major Crops, Food Crops other than Grains, Non Food Crops, Technological and Institutional Reforms
   - Food Security (excluding impact of globalization on agriculture)

5. **Minerals and Energy Resources**
   - What is a mineral?
   - Mode of occurrence of Minerals – Where are these minerals found?, Ferrous Minerals, Non-Ferrous Minerals, Non-Metallic Minerals, Rock Minerals
   - Conservation of Minerals
   - Energy Resources – Conventional Sources of Energy, Non-Conventional Sources of Energy
   - Conservation of Energy Resources

6. **Manufacturing Industries:**
   - Importance of Manufacturing – Industrial Location (excluding Industry Market Linkage), Agro based Industry (excluding Cotton Textiles, Jute Textiles, Sugar Industry), Mineral based Industries (excluding Iron Steel Industry, Cement Industry), Industrial Pollution and Environmental Degradation, Control of Environmental Degradation

7. **Life Lines of National Economy:**
   - Roadways
   - Railways
   - Pipelines
   - Waterways
   - Major Seaports

- Airways
- Communication
- International Trade
- Tourism as a Trade

Democratic Politics – II

1. **Power Sharing:**
   - Belgium and Sri Lanka
   - Majoritarianism in Sri Lanka
   - Accommodation in Belgium
   - Why power sharing is desirable?
   - Forms of Power Sharing

2. **Federalism:**
   - What is Federalism?
   - What make India a Federal Country?
   - How is Federalism practiced?
   - Decentralization in India

3. **Gender, Religion and Caste:**
   - Gender and Politics - Public/Private division, Women's political representation
   - Religion, Communalism and Politics –Communalism, Secular State
   - Caste and Politics - Caste inequalities, Caste in politics, Politics in caste

4. **Political Parties:**
   - Why do we need Political Parties? –
   - Meaning, Functions, Necessity
   - How many parties should we have?
   - National Parties
   - State Parties
   - Challenges to Political Parties
   - How can Parties be reformed?

5. **Outcomes of Democracy:**
   - How do we assess democracy's outcomes?
   - Accountable, responsive and legitimate government
   - Economic growth and development
   - Reduction of inequality and poverty
   - Accommodation of social diversity
   - Dignity and freedom of the citizens

Understanding Economic Development

1. **Development:**
   - What Development Promises – Different People, Different Goals
   - Income and Other Goals
   - National Development
   - How to compare different countries or states?
   - Income and other criteria
   - Public Facilities
   - Sustainability of Development

2. **Sectors of the Indian Economy:**
   - Sectors of Economic Activities
   - Comparing the three sectors
   - Primary, Secondary and Tertiary Sectors in India
   - Division of sectors as organized and unorganized
   - Sectors in terms of ownership: Public and Private Sectors

3. **Money and Credit:**
   - Money as a medium of exchange
   - Modern forms of Money
   - Loan activities of Banks
   - Two different Credit situations
   - Terms of Credit
   - Formal Sector Credit in India
   - Self Help Groups for the Poor

4**. Globalization and the Indian Economy:**
   - Production across countries
   - Inter linking production across countries
   - Foreign Trade and integration of markets
   - What is Globalization?
   - Factors that have enabled Globalization
   - World Trade Organization
   - Impact of Globalization in India
   - The Struggle for a fair Globalization

5. **Consumer Right**

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 समिल्लित 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।	

पाठ्यक्रम - TGT संस्कृत

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 समिल्लित है, हालाँकि प्रश्नों के माध्यम से उपरोक्त अवधारणाओं और अनुप्रयोगों की स्नातक स्तर की गहन समझ का आकलन किया जाएगा.

रुचिरा, प्रथमोभाग:, एन सी ई आर टी, नई दिल्ली द्वारा प्रकाशित

शब्दपरिचयः-I; शब्दपरिचयः-II; शब्दपरिचय:-III; विद्यालयः ; वृक्षाः ; समुद्रतटः ; बकस्यप्रतीकारः ; सूक्तिस्तबकः ; क्रीडास्पर्धा ; कृषिकाःकर्मवीराः ; दशमः त्वम् असि ; विमानयानं रचयाम ; अहह आः च ; कारक-विभक्ति-परिचयः, शब्दरूपाणि(अकारान्त-उकारांत पुँल्लिंगशब्दरूपाणि), धातुरूपाणि(लट्लकारे प्रथमपुरुषः, सर्वनामपदपरिचय:, संख्याज्ञानम् ।

रुचिरा, द्वितीयोभाग:, एनसीईआरटी, नईदिल्ली द्वारा प्रकाशित

सुभाषितानि ; दुर्बुद्धिः विनश्यति ; स्वावलम्बनम् ; पण्डिता रमाबाई ; सदाचारः ; सङ्कल्पः सिद्धिदायकः ; त्रिवर्णःध्वजः ; अहमपि विद्यालयं गमिष्यामि; विश्वबन्धुत्वम्; समवायो हि दुर्जयः ; विद्याधनम् ; अमृतं संस्कृतम् ; लालनगीतम् ; परिशिष्टवर्णविचारः, कारकम्, शब्दरूपाणि, धातुरूपाणिच

रुचिरा, तृतीयोभाग:, एनसीईआरटी, नईदिल्ली द्वारा प्रकाशित

सुभाषितानि ; बिलस्य वाणी न कदापि मे श्रुता ; डिजीभारतम् ; सदैव पुरतो निधेहि चरणम् ; कण्टकेनैव कण्टकम् ; गृहं शून्यं सुतां विना ; भारतजनताहम् ; संसारसागरस्य नायकाः ; सप्तभगिन्यः ; नीतिनवनीतम् ; सावित्रीबाईफुले ; कः रक्षति कः रक्षितः ; क्षितौ राजते भारतस्वर्णभूमिः ; आर्यभटः ; परिशिष्टम्सन्धिः, कारकम्, शब्दरूपाणि(मातृ-अस्मद्-युष्मद्-स्वसृ-राजन् च) ; धातुरूपाणि(पठ्-खाद्-इच्छ् च धातवः) ; प्रत्यय:(तुमुन्-क्त्वा-ल्यप् च) I

शेमुषी, प्रथमोभाग:, एनसीईआरटी, नईदिल्ली द्वारा प्रकाशित

भारतीवसन्तगीतिः ; स्वर्णकाकः ; गोदोहनम् ; सूक्तिमौक्तिकम् ; भ्रान्तोबालः ; सिकतासेतुः ; जटायोः शौर्यम् ; पर्यावरणम् ; वाङ्मनः प्राणस्वरूपम् व्याकरणवीथि:, सन्धि: (स्वर:-दीर्घः, गुणः, वृद्धिः, यण्, अयादि ; **व्यंजन**-जश्त्वसंधिः, 'म्' स्थाने अनुस्वारः, ; विसर्गसंधिः-विसर्गस्य उत्वम्-रत्वम्) ; शब्दरूपाणि (बालक-कवि-साधु-पितृ-लता-नदी-मातृ-राजन-भवत्-विद्वस्-अस्मद्-युष्मद्-तत्-इदम्-किम्)
धातुरूपाणि (पठ्-गम्-वद्-भू-क्रीड्-नी-दृश्-शक्-ज्ञा-अस्-कृ-दा-क्री-श्रु-पा-सेव्-लभ्) ; कारकविभक्तय: ; प्रत्यया: (क्त्वा-तुमुन्-ल्यप्-क्तवतु-शतृ-शानच्-क्त) ; संख्याज्ञानम् ; उपसर्गा: (द्वाविंशतिः ; अव्ययानि (स्थानबोधकानि:-अत्र-तत्र-अन्यत्र-सर्वत्र-यत्र-एकत्र-उभयत्र ; कालबोधकानि:-यदा-तदा-सर्वदा-एकदा-पुरा-अधुना-अद्य-श्व:-ह्य: ; प्रश्नबोधकानि:-किम्-कुत्र-कति-कदा-कुत:-कथम्-किमर्थम् ; अन्यानि:-च-अपि-यदि-तर्हि-यथा-तथा-सम्यक्-एव) ; रचनाप्रयोग, ; पत्रलेखनं

शेमुषी**,** द्वितीयोभाग**:,** एनसीईआरटी, नईदिल्ली द्वारा प्रकाशित

शुचिपर्यावरणम् ; बुद्धिर्बलवती सदा; शिशुलालनम् ; जननीतुल्यवत्सला ; सुभाषितानि ; सौहार्दंप्रकृतेः शोभा ; विचित्रःसाक्षी ; सूक्तयः अन्योक्तयः

व्याकरणवीथि**:,**

सन्धि:(**व्यंजन**-वर्गीयप्रथमवर्णस्य तृतीयवर्णे परिवर्तनं, प्रथमवर्णस्य पञ्चमवर्णे परिवर्तनम् ; विसर्गसंधिः-विसर्गस्य उत्वम्-रत्वम्, विसर्गलोपः, विसर्गस्य स्थाने स्-श्-ष्) ; अव्यय:(उच्चैः-च-श्वः-ह्यः-अद्य-अत्र-तत्र-यत्र-कुत्र-इदानीम्-अधुना-सम्प्रति-साम्प्रतं-यदा-तदा-कदा-सहसा-वृथा-शनैः-अपि-कुतः-इतस्ततः-यदि-तर्हि-यावत्-तावत्),

प्रत्यय: (तद्धिताः-मतुप्-ठक्-त्व-तल् ; स्त्रीप्रत्ययौ-टाप्-ङीप्), समास: (तत्पुरुषः-विभक्तिः, बहुव्रीहिः, अव्ययीभावः-अनु,उप,सह,निर्,प्रति,यथा, द्वंद्वः-केवलम् इतरेतरः), वाच्यपरिवर्तनम् (केवलं लट्लकारे-कर्तृ,कर्म,क्रिया), रचनाप्रयोग, समय: , अशुद्धि: संशोधनं ; पत्रलेखनं

A. Subject specific syllabus for TGTs

Direct Recruitment (2022)

- Art Education
- Physical & Health Education
- Work experience

B. Subject specific syllabus

Direct Recruitment (2022)

- Librarian

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

Syllabus for the post of TGT - Art Education

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

DRAWING AND PAINTING

HISTORY OF INDIAN ART

I. Art of Indus Valley (Harappan and Mohenjo-daro) (2500 B.C. to 1500 B.C.)

(1) Introduction

(i) Period and Location.

(ii) Extension: In about 1500 miles

(a) Harappa & Mohenjo-daro (Now in Pakistan)

(b) Ropar, Lothal, Rangpur, Alamgirpur, Kali Bangan, Banawali andDhaula Veera (in India)

(2) Study of following
Sculptures and Terracottas:

(i) Dancing girl (Mohenjo-daro)
Bronze, 10.5 x 5 x 2.5 cm.
Circa 2500 B.C.

(Collection : National Museum, New Delhi).

(ii) Male Torso (Harappa)

Stone, 9.2 x 5.8 x 3 cms.
Circa 2500 B. C.

(Collection : National Museum, New Delhi).

(iii) Mother Goddess (Mohenjo-daro) terracotta, 22 x 8 x 5 cm.Circa 2500 B.C.
(Collection : National Museum, New Delhi).

(3) Study of followingSeal:

(i) Bull (Mohenjo-daro)

Stone, 2.5 x 2.5 x 1.4 cm.
Circa 2500 B.C.

(Collection : National Museum, New Delhi).

(4) Study of following
Decoration on earthen wares:

(i) Painted earthen-ware(Jar)Mohenjo-daro)
(Collection : National Museum, New Delhi).

II. Buddishist, Jain and Hindu Art.
(3rd century B.C. to 8th century A.D.)

(1) General Introduction to Art, during Mauryan, Shunga, Kushana & Gupta Period:

(2) Study of following

Sculptures:

(i) Lion Capital from Sarnath (Mauryan period)
Polished sand stone,

Circa 3rd Century B.C.

(Collection: Sarnath Musseum, U.P.)

(ii) Chauri Bearer from Didar Ganj (Mauryan period)
Polished sand – stone

Circa 3rd Century B.C.

(iii) Bodhisattva head from Taxila (Gandhara Period)
Stone, 27.5 x 20 x 15 c.m.

Circa 2nd Century A.D.

(Collection: National Museum, New Delhi)

(iv) Seated Buddha from Katra Tila
Mathura – (Kushan Period)
(Collection: Mathura Museum)

(v) Seated Buddha from Sarnath (Gupta Period)
Stone
Circa 5th Century AD
(Collection: Sarnath Musseum, U.P.)

(vi) Jain Tirathankara (Gupta period)
Stone
Circa 5th Century AD
(Collection at State Museum, Lucknow U.P.)

(3) Introduction to Ajanta

Location, period, No. of caves, Chaitya and Vihara, Paintings and Sculptures subject matters and techniques etc.

(4) Study of following

Painting & Sculpture:

(i) Padmapani Bodhisattva (Ajanta Cave No. I)
Mural Painting

Circa 5th Century A.D.

(ii) Mara Vijay (Ajanta Cave No. 26)
Sculpture in stone

Circa 5th Century A.D.

III. Temples Sculpture, Bronzes and Indo-Islamic Architecture

Artistic aspects of Indian Temples

(6th Century A.D. to 13th Century A.D.)

(1) Introduction to Temple Sculpture

(6th Century A.D. to 13th Century A.D.)

(2) Study of following Temple-Sculptures;

(i) Descent of Ganga (Pallava period, Mahabalipuram Tamilnadu), Stone Circa7th Century A.D.
(ii) Ravana Shaking Mount Kailash (Rashtrakuta period, Ellora,
(iii) Trimurti (Elephanta, Maharashtra)
Stone
Circa 9th Century A.D.

(iv) Lakshmi Narayana (Kandariya Mahadev Temple) (Chandela; Period, Khajuraho, M.P.)

Circa 10th Century A.D.

(V) Cymbal Player Sun Temple (Ganga Dynesty, Konark, Orissa)Circa 13th Century A.D.
(vi) Mother & Child (Vim la-Shah Temple, Solanki Dynesty, Dilwara, MountAbu, rajastahn) White marble.
Circa 13th Century A.D.

(3) Bronzes

(i) Introduction to Indian Bronzes

(ii) Method of casting (solid and hollow)

(4) Study of following south Indian Bronzes;

Chola period (12th Centry a.D.) (Collection: National Museum, New Delhi)

(ii) Devi (Uma)

Chola Period(12th Centry a.D.) (Collection: National Museum, New Delhi)

(5) Artistic Aspects of the Indo-Islamic Architecture
(i)Introduction

(6) Study of following architectures:
(i) Qutab Minar, Delhi

(ii) Taj Mahal, Agra

(iii) Gol Gumbaj of Bijapur

IV. The Rajasthani and Pahari Schools of Miniature painting (16th Century A.D to 19thCentury A.D.)

Introduction to Indian Miniature Schools: Western-Indian, Pala, Rajasthani,Mughal, Central India, Deccan and Pahari.

(A) The Rajasthan; Schools

(1) Origin and Development

(2) Schools-Mewar, Bundi, Jodhpur, Bikaner, Kishangarh andJaipur

(3) Main features of the Rajasthani & Pahari Schools.

(4) Study of the following Rajasthani Paintings:

Title	Painter	School
Maru-Ragini	Sahibdin	Mewar
Raja Ajniruddha Singh Heera	Utkal Ram	Bundi
Chaugan Players	Dana	Jodhpur
Krishna on swing	Nuruddin	Bikaner
Radha (Bani – Thani)	Nihal Chand	Kishangarh
Bharat meets Rama at Chitrakut	Guman	Jaipur

(B) The Pahari Schools:

(1) Origin and development

(2) Schools-Basohli and Kangra

(3) Main features of the Pahari School

(4) Study of the following pahari Paintings

Title	Painter	School
Krishna with Gopies		Basohli
Raga Megha		Kangra

V. The Mughal and Deccan Schools of Miniature Painting (16th Century AD to 19thCentury A.D.)

The Mughal School

(A) (1) Origin and development

(2) Main features of the Mughal School

(3) Study of the following Mughal paintings

Title	Painter	School
Krishna lifting mount	Goverdhan	Miskin Akbar
Babur crossing the river sone	Jaganath	Akbar
Jahangir holding the picture of Madona	Abul Hassan	Jahangir
Falcon on a bird nest	Ustad Mansoor	Jahangir
Kabir and Raidas	Ustad Faquirullah Khan	Shahjahan
Marriage procession of Dara Shikoh	Haji Madni	Provincial Mughal(Oudh)

(B) The Deccan School

(1) Origin and development

(2) Main features of the Deccan School

(3) Study of the following Deccan paintings

Title	Painter	School
Raga Hindola		Ahmednagar
Chand Bibi Playing Polo(Chaugan)		Gol Konda

VI. The Bengal school and the Modern trends in Indian Art

(A) (1) A. New Era in Indian Art- an introduction

B. Study of the following painting

(i) Rama Vanquishing the pride of the ocean-Raja Ravi Verma

(2) Evolution of the Indian national Flag (First – 1906, Middle – 1921 andFinal 1947 stages): Study of the form and the colour scheme

(B) (1) Introduction to the Bengal School of painting

(i) Origin and development of the Bengal School

(ii) Main Features of the Bengal school

(2) Contribution of Indian artists in the struggle for National Freedom Movement

(3) Study of the follwing paintings of the Bengal School

(i) Jouney's End – Rabindranath Tagore

(ii) Parthasarthi – nandlal Bose

(iii) Radhika – M.a.R. Chughtai

(C) The Modern Trends in Indian Art

Introduction

(1) Study of the following Paintings:

(i) Magician-Gaganendranath Tagore

(ii) Mother and child-Jamini Roy

(iii) Woman face-Rabindranath Tagore

(iv) Tree Girls-Amrita Sher gill

(2) Study of the following pieces of Sculpture:

(i) Triumph of labour- D.P. Roychowdhury

(ii) Santhal Family-Ramkinker Vaij

(3) Study of the following work of contemporary Indian Art'

A Paintings

(i) Mother Teresa-M.F. Hussain.
(ii) Birth of Poetry- K.K. Hebbar
(iii) Gossip- N.S. Bendre
(iv) Diagonal- Tyeb Mehta

B Graphic Prints

(i) Whirl Pool-Krishna Reddy
(ii) Children-Somnath Hore
(iii) Devi-Jyoti Bhatt

C Sculptures

(i) Standing Woman-Dhanraj Bhagat
(ii) Cries Un-heard-Amar nath Sehgal
(iii) Ganesha-P.V. Jankiram
(iv) Figure- sankho Chaudhuri
(v) Chatturmukhi – Aekka Yada Giri Rao

Note: The names of artists and their art work as listed above are only suggestive and in no way exhaustive.

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.

Syllabus for the post of TGT - Work Experience

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

(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 Diodes

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 f_a,$f_b$and 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 Devices

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) Noninusoidal Oscillators

Nonsinusoidal Waveforms 't-Classification of Nonsinusoidal 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 DeModulation

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? - Ie 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