

Scheme & Syllabus

For

**Recruitment of Trained Graduate Teachers (Initial
Appointee) in SSD Schools.**

**ST & Sc Development, M&B C Welfare
Department, Govt of Odisha**

Scheme for Written Examination for Recruitment of Trained Graduate Teachers (Initial Appointee) in SSD Schools.

Test Duration	90 Minutes
Total Questions	100 Objective Type Multiple Choice Questions
Total Marks	100 marks*

*Each question will carry one mark each and there will be Negative marking @0.25marks for each wrong response.

Category	Part	Type of Questions	Number of Questions	Full Marks	Level	Language s	Subjects
Common Paper for TGT Science / Arts	I	MCQ	70	70	-NA-	English	a)General Knowledge & Current Affairs, b)Reasoning Ability, c)Computer Literacy, d)Pedagogy, Educational Management and Policy & Evaluation.
TGT Science PCM	II	MCQ	30	30	Graduation	English	a)Physics, b)Chemistry, c)Mathematics
TGT Science CBZ	II	MCQ	30	30	Graduation	English	a)Chemistry, b)Botany, c)Zoology
TGT Arts	II	MCQ	30	30	Graduation	English	a) History+ Political Science, b) Geography+ Economics, c) English
						Odia	d)Odia

Part-I

- | | |
|--|------------|
| 1. General Knowledge and Current Affairs | (20 Marks) |
| 2. Reasoning Ability | (20 Marks) |
| 3. Computer Literacy | (10 Marks) |
| 4. Pedagogy, Educational Management, Policies & Evaluation | (20 Marks) |

Part-II

- | | |
|------------|------------|
| 5. Subject | (30 Marks) |
|------------|------------|

Total Marks

(100 Marks)

**Syllabus for Written Examination for Recruitment of Trained
Graduate Teachers (Initial Appointee) in SSD Schools.**

**Part -1
(Total 70 marks)**

[General Knowledge and Current Affairs, Reasoning Ability, Computer Literacy, Pedagogy, Educational Management, Policy and Evaluation]

Section-I

1. General Knowledge and Current Affairs (20 Marks)

- i. Current events of State (Odisha), National and International Importance
- ii. History of Odisha / India and Indian National Movement
- iii. Indian and World Geography
- iv. Indian Polity
- v. Economic and Social Development
- vi. Everyday Science

Section-II

2. Reasoning Ability (20 Marks)

- i. General mental ability,
- ii. Logical reasoning and analytic ability
- iii. Decision making and problem solving
- iv. Basic numeracy
- v. Data interpretation

Section-III

3. Computer Literacy (10 Marks)

- i. Basic computer literacy skills for use of ICT in classrooms
- ii. Concepts, terminology and operations that relate to general computer usage.
- iii. Basic Hardware of Computer
- iv. Common Applications,
- v. Networking and Internet
- vi. Social Networking
- vii. Digital Citizenship

Section-IV

4. Pedagogy, Educational Management, Policies & Evaluation (20 Marks)
A. Child Development (Process of Growing Up)

1. Growth and Development

- Concept, Difference & Principles of Development
 - Factors affecting Development (Nutrition, Intelligence, Psycho-social, Diseases, Injury etc.)
 - Growth and development during Adolescence
 - Counseling services for Adolescents
2. Factors Affecting Different Developmental Aspects
- Cognitive
 - Social(Erikson's Theory)
 - Emotional
 - Moral(Kohlberg theory)
 - Language Development
 - Needs and problems at childhood and Adolescence
3. Approaches to Understanding the Nature of Intelligence
- Psychometric approach (Thurstone, Guilford ,Gardener)
 - Information Processing Approach-Sternberg
 - Cognitive Development Approach-Piaget
 - Social Constructive Approach-Vygotsky

B. Learning Process / Pedagogy

1. Understanding the Learning Process
- Learning as a process and an outcome
 - Approaches – Humanistic (Karl Rogers)
 - Constructivist (Piaget and Vygotsky)
 - Basic conditions of learning: Readiness, Maturation, Motivation, Task and Methods
2. Organizing Learning
- Teacher-Centric, Learner –Centric, Learning-Centric
 - Characteristics and Process
3. Critical Pedagogy
- Concept, Characteristics, Process, Stages
 - Approaches
4. Addressing Classroom Diversity
- Using varieties of TLMs and AV Aids
 - Using context of the learner
 - Using variety of activities while group learning, small group learning and self learning
 - Learner in the context of Inclusive Education

C. Educational Management

- Educational Management: Concept, Importance and Scope, Types of Management, Democratic and Autocratic, Centralized and Decentralized
- Management Structure at different levels, National/State/District/Sub-district (BRCs, CRCs, SMCs, SMDC)
- School Development Plan (SDP): Concept, purpose, Key action by Headmaster, students, Parents and SMDC
- Steps in planning for school development
- Annual and prospective plan
- School Management: Role of Headmasters, Teachers, Community

E. Educational Policies and Programmes

- Kothari Commission 1968
- National Educational Policy 1986
- RTE Act, 2009

- National Curriculum Framework, 2005
- National Education Policy 2020
- SSA, RMSA and Samagra Shiksha

F. ASSESING THE LEARNER / PERFORMANCE (EVALUATION)

1. Assessment and Evaluation

- Assessment and evaluation in constructive perspective
- Concept, Continuous and Comprehensive Evaluation , Formative, Summative and Diagnostic Assessment

2. Assessment and Learning

- Assessment of Learning, Assessment for learning, Assessment as Learning
- Subject-based learning in a constructivist perspective
- Assessment tools and techniques –Projects, Assignments, Observation, Teacher made Tests
- Self-assessment, Peer-assessment
- Portfolios, rubrics

3. Test Construction

- Steps and Principles of Test Construction
- Development of blue print
- Preparation of test items
- Standardized and Teacher made Test

4. Recent Developments in Assessment

- Grading
- Assessment in co-scholastic area
- Implementation strategy of Continuous and Comprehensive Evaluation
- Recommendations of NCF-2005

Part -2
(Total 30 Marks)

TGT Science: (PCM)

(This section shall carry equal marks from Physics, Chemistry and Mathematics subjects with equal proportion of marks)

Section I

PHYSICS

[10 questions are to be asked. Each question carries 01 mark]

Unit-1 Motion

Newton's laws of motion, Kinematic Equations of motions with acceleration, Graphical representation of Kinematics Equations of motion, Relative velocity and relative acceleration, work energy and power, conservation of energy, collision problem and conservation of linear momentum, forces of nature, friction force.

Circular motion, Rotational Kinematics, Conservation of angular momentum, Moment of Inertia.

Motion under Gravity, project motion, Simple harmonic motion, and Kinematics of simple harmonic motion, simple pendulum.

Unit-2 Gravitation

Kepler's law of planetary motion, Newton's law of gravitation, Acceleration due to gravity, Gravitational field and potential, Escape velocity and satellite motion, Geo stationary Satellites.

Unit-3 Properties of Matter

Inter- atomic and intermolecular force, Elasticity, Stress, Strain and Hook's law , Elastic module

Kinetic theory of gases, concept of heat, pressure and temperature, specific heat, law of equipartition of energy, Universal Gas laws, measurement of Pressure

Surface tension, surface energy, angle of contact, excess pressure, capillarity, viscosity, Poiseuille's law, Stokes's Law, Bernoulli's Equation of fluid motion.

Hydrostatics, Buoyancy, Archimedes Principle, Laws of flotation.

Unit-4 Sound

Waves, Progressive and stationary waves, mechanical waves, equation of a progressive wave, transverse vibration of a string, speed of sound waves, Newton's formula, Super-position of sound waves, Beats, Echo, Doppler's effect, Musical sound and its characteristics.

Unit-5 Optics

Laws of reflection and refraction in transparent medium, total internal reflection, refraction through prisms, Dispersion, Reflection and image formation plan and spherical mirrors, equation for object and image distances for spherical mirrors, image formation in convex and concave lenses, lens equation for convex and concave lenses, power of single and combination of two lenses. Image formation in the eye and defects of vision, microscope and astronomical telescope.

Wave optics, Huygens's principle, Coherent sources and interference, Young's double slit, Bi-prism, Newton's ring experiments, Diffraction of light through single slit and plane transmission grating.

Unit-6 Electrostatics

Coulomb's law and unit of charge, force on charge due to discrete and continuous charge distributions, lines of force and electric field, field due to a point charge and a dipole, electrostatic potential, potential due to a point charge and an electric dipole, electric potential energy of a group of point charges, electric flux, Gauss law and applications, Capacitor, capacitance of parallel plate and spherical capacitors, combinations of capacitors in series and parallel.

Uni-7 Current Electricity

Ohm's law, current and voltage measurements, resistance and Resistivity, combination of resistances in series and parallel, electromotive force, grouping of resistors and cells. Kirchhoff's laws and their applications.

Electric energy and power, heating effect of electric current, Faraday's law of electrolysis.

Magnetic field and magnetic induction, Biot-Savart law, magnetic field due to a straight conductor, a circular coil and a solenoid carrying current. Ampere's circuital law, Lorentz force on a charge particle in uniform electric and magnetic fields. Force between two parallel conductors carrying current.

Unit-8 Electromagnetic induction

Faraday's law of electromagnetic induction, Lenz's law, eddy current, self and mutual induction, emf induced in a rotating coil. Alternating current, average and RMS values of alternating currents, simple AC circuits (RC, RL and RLC), concept of admittance and impedance. Transformers and simple AC devices (motor, dynamo).

Section-II

CHEMISTRY

10 questions are to be asked. Each question carries 01 mark

Unit-1 Basic Concepts

Atomic, molecular and equivalent masses, mole concept, types of chemical reactions, calculations based on stoichiometry. Equivalent mass of acid, salt, oxidant and reductant.

Unit-2 States of Matter

Gas laws- Boyle's law, Charles' law, combined gas equation, ideal gas equation, Graham's law of diffusion/ effusion, Dalton's law of partial pressure.

Characteristics of Liquids: Vapour pressure, viscosity and surface tension. Colligative properties of solutions (solute and solvent forming binary solution).

Unit-3 Structure of Atom

Bohr's model and its limitations, concept of shells and sub-shells, dual nature of matter and light. De Broglie's relationship, Heisenberg uncertainty principles, concepts of orbital's, quantum numbers, shape of s, p and d orbital, rules of filling electrons in orbitals- Aufbau principle and Hund's rule, electronic configuration of atoms, stability of half filled and completely filled orbitals.

Unit-4 Classification and elements and periodicity in properties

Modern periodic law and the present form of periodic table, periodic trends in properties of elements- atomic radii, ionic radii, ionization enthalpy, electron gain enthalpy, electro negativity, valency.

Unit-5 Chemical bonding and molecular Structure

Ionic bond, covalent bond, polar character of covalent bond, covalent character of ionic bond, concept of hybridization, VSEPR Theory and shapes of some simple molecules, hydrogen bond and metallic bond.

Unit-6 Chemical reactions

Types of chemical reactions, redox reaction, Oxidation number calculations, balancing of redox equations by oxidation number and ion electron methods, neutralization reactions and volumetric analysis.

Unit-7 Chemical Equilibria and Ionic Equilibria

Equilibrium in physical and chemical processes, law of mass action, equilibrium constants (K_c , K_p , K_x) relation among them, the reaction quotient and its relation with equilibrium. Le-Chateliers principle and its applications.

Theories of acids and bases, ionization of weak acids and bases, ionic product of water pH and other logarithmic terms, common-ion effect, solubility product and its application in salt analysis.

Unit- 8. General Principles of extraction of metals

Occurrence of metals, ores and minerals, concentration, calcinations, roasting, smelting, reduction methods (carbon reduction, aluminothermic process, electrolytic and self- reductions) and metal extraction, flux and slag refining of metal. Reactions involved in the Blast furnace for extraction of iron.

Unit-9 Some basic principles of organic chemistry

- a) Classification and IUPAC nomenclature of organic compounds
- b) Electronic displacement in covalent bond: inductive effect, electronic effect, resonance and hyper conjugation
- c) Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

Unit-10 Hydrocarbons

Classification of Hydrocarbons.

- a. Aliphatic Hydrocarbons: general methods of preparation, properties and uses of alkanes, alkenes and alkynes.
- b. Aromatic Hydrocarbons: benzene, resonance aromaticity, chemical properties, directive influence of functional group in mono-substituted benzene.

Section-III

MATHEMATICS

[10 questions are to be asked. Each question carries 01 mark]

1. Set Theory and its Application

- Union, intersection, difference, complement, power set, number of elements in union and intersection of finite sets.

2. Relations and Functions

- Reflexive, Symmetric, transitive and equivalence relations, injective, surjective and bijective functions, inverse of a function.

3. Number System

- Natural numbers, integers, rational numbers, irrational number, real number, absolute values of numbers, triangle inequality.

4. Quadratic & Linear Equations

- Fundamental theorem of Algebra, roots, discriminates, nature of the roots, relation between the roots and coefficients.

5. Calculus of One Variable

- Limit, continuity, derivative, tangent, normal, increasing and decreasing functions.

6. Sequence and Series

- Arithmetic and Geometric progressions, monotonic sequence, exponential series, logarithmic series, Taylor's series, Maclaurin's series.

7. Coordinate geometry

- Distance formula, section formula, area of a triangle, locus and its equation, straight line, circle, conic section.

8. Analytical Solid Geometry

- Plane, straight line, Sphere

9. Probability

- Trial, Sample point, Sample Space, Event, Addition Theorem, Binomial Distribution.

10. Statistics

- Mean, Mode, Median, Mean Deviation, Standard Deviation, Variance

11. Trigonometry

- Angles associated with 90, 180, 270, 360 compounded angle formula, sub-multiple angle formula, Trigonometry Equations, Inverse trigonometric functions, Height and Distance.

12. Mensuration

- Circumference of a circle, length of the arc of a circle, area of a circle, sector and segment, area of a circle annulus, area of a sectional region, area of segment, surface area and volume of a prism, right circular cylinder, cone and sphere.

TGT Science: (CBZ)

(This section shall carry equal marks from Chemistry Botany and Zoology subjects with equal proportion of marks)

Section I

Chemistry

[10 questions are to be asked. Each question carries 01 mark]

(Same as in TGT PCM Syllabus)

Section II

BOTANY

[20 questions are to be asked. Each question carries 01 mark]

1. Plant Diversity and Conservation

- Nomenclature and classification of plant kingdom, plant divisions- Thallophyta, Bryophyte, Pteridophyta, Gymnosperms and Angiosperms, their habitat and complexity in their structural organization. Endangered plant species and their conservation measure.

2. Tissue System

- Meristematic and permanent tissues: their types, organization and functions.
- Tissue System: Epidermal, ground and vascular tissue system, internal structure of dicot and monocot stems and roots secondary growth in plants.

3. Photosynthesis

- Structure and photosynthetic pigments, Light reaction: light absorption, electron transport and photophosphorylation, Dark reaction- CO₂ fixation by C₃, C₄ and CAM plants, photorespiration.

4. Growth Regulators in Plants

- Auxins, Gibberellins, Cytokinins, Ethylene and Abscissic acid, their role in plant growth regulation.

5. Reproduction in plants

- Vegetative reproduction: Fission, budding and cutting(grafting) and propagation in angiosperms.
- A sexual Reproduction: Sporulation, Conidia formation and other special structure formation.
- Sexual Reproduction: Isogamy, Anisogamy and Oogamy, double fertilization and triple fusion in angiosperms.
- Parthenogenesis: Tissue culture and micro propagation

6. Mendelism

- Mendelian factors, Monohybrid cross and principles of dominance and segregation.
- Di hybrid cross: Laws of independent assortment.
- Deviations from Mendelian principles

7. Plant Diseases and Control Measures

- Causal Organisms, symptoms, life cycle and control measures of following diseases: Late blight of potato, powdery mildew, Rust and Smut of Wheat, Leaf Spot and blast disease of rice.

Section III
ZOOLOGY

[10 questions are to be asked. Each question carries 01 mark]

1. Taxonomy

- Five kingdom classification, Characteristics and Examples of each animal phylum (in case of phylum Chordate up to Classes)

2. Cytology

- Cell structure and cell division (mitosis and meiosis), DNA and RNA

3. Genetics

- Linkage, Crossing over, Mutation, Chromosomal aberration and chromosomal mechanism of sex determination

4. Evolution

- Darwinism, Modern Synthetic theory of evolution (variation, selection and isolation)

5. Ecology

- Eco-system, Food Chain and Food Web, Energy Flow, Ecological Pyramids, Renewable and Non-renewable energy resources, Biodiversity (meaning and conservation), Causes, Effects and Control of Air pollution.

6. Nutrition

- Types of food and types of nutrition,

7. Respiration

- Types of respiration (aerobic and anaerobic) Glycolysis and Krebs Cycle

8. Circulation

- Blood (Composition and function) in man, structure and working of human heart

9. Excretion

- Human Kidney (structural details), mechanism of urine formation

10. Control and Coordination

- Structure of neuron, synaptic transmission, structure of human brain and function of its different parts, names of endocrine glands and secreted hormones with their specific functions

11. Reproduction and Development

- Structure of Gonads (ovary and testes) and Gametes in man, Fertilization. Types of cleavage.

TGT Arts (Social Studies)

(30 Marks)

(This section shall carry the questions from History & Political Science (05 Marks), Geography & Economics (05 Marks), English (10 Marks) & Odia (10 Marks) each.)

Section- I

HISTROY + POLITICAL SCEINCE (05 MARKS)

HISTORY

1. Great Rulers of Ancient India
 - Ashoka – Conquests, administration and missionary activities
 - Kharavela – Achievements as mentioned in Hatigumpha inscription
 - Samudragupta – Conquests
 - Harshavardhana – Conquests, administration and religious activities
2. Development of Art and Architecture during Maurya Age, Gupta Age and Kushana Age
3. Development of Literature and Science in Ancient India
4. Administration during Delhi Sultanate with special reference to Balban, Alauddin Khilji and Feroze Shah Tughlaq.
5. Mughal architecture and painting during the reign of Akbar, Jahangir and Shahjahan
6. Rise of British power in India from 1757 to 1856
 - Robert Clive and foundation of British Power
 - Administrative and judicial reforms of Warren Hastings
 - Revenue reforms of Lord Cornwallis
 - Subsidiary alliance
 - Reforms of Lord William Bentinck
 - Doctrine of Lapse
7. Growth of India Nationalism, 1857-1905
 - Revolt of 1857
 - Development of press and literature
 - Education
 - Formation of Political associations
8. Indian National Movement, 1905-1947
 - Swadeshi movement
 - Non-cooperation movement
 - Civil Disobedience movement
 - Quit India movement
 - Indian National Army
 - Partition and Independence
9. First World War and Russian Revolution
 - Causes and consequences of First World War
 - Causes Progress and Effects of Russian Revolution
10. Second World War- Causes and Consequences

POLITICAL SCIENCE

1. Salient features of Indian Constitution
2. Preamble, Fundamental Rights, Directive Principles of State Policy, Fundamental Duties
3. Union Government – President, Prime Minister, Council of Ministers, Parliament and Supreme Court

4. State Government – Governor, Chief Minister, Council of Ministers, Legislative Assembly and High Court.
5. Local Governance – Urban and Rural
6. Electoral Process and Election Commission
7. India's Foreign Policy and its relation with neighbours
8. United Nations – General Assembly, Security Council Human Rights
9. Socialism, Liberalism, Democracy, Authoritarianism, Welfare State and Globalization
10. Kautilya, Raja Ram Mohan Roy, Bal Gangadhar Tilak, Swami Vivekananda, Mahatma Gandhi, Nehru, B.R. Ambedkar

Section- II

GEOGRAPHY + ECONOMICS (05 MARKS)

GEOGRAPHY

1. Physical Geography of India
 - Physiography
 - Drainage
 - Climate
2. Resources with Special Reference to India
 - Types and Classification, Land Resources; Biotic Resources
 - Mineral, Energy, Water Resources
 - Agriculture and Industrial Resources
3. Physical Geography
 - First, Second and third order land forms; Development of land forms – work of rivers, wind and glaciers. Interior of the earth, rocks and their types
 - Structure and composition of the atmosphere, insolation and temperature; Pressure and Winds; Humidity and Rainfall
 - General relief of ocean floor: Salinity and temperature of the ocean water. Oceanic circulation – waves, tides currents
4. Globe and Maps
 - Basic features; types of maps; map scale; contours of relief features
 - Concept of latitude and longitude; International dateline Time Zones; Local and Standard Time.

ECONOMICS

1. Indian Economy
 - Features and broad demographic characteristics; Need and Policies for facing the challenges of over population
2. Current Challenges of Indian Economy
 - Poverty – Measures of poverty; causes, consequences, policy and programmes adopted for poverty eradication; Remedies.
 - Unemployment – Types and measures of unemployment; Causes, consequences and programmes adopted for reducing unemployment.
 - Inflation – Meaning and types; Demand pull and cost push inflation; Causes and consequences and measures taken to control inflation.
3. Economic Development