

SYLLABUS FOR COMPUTER BASED RECRUITMENT TEST (CBRT)
FOR THE POST OF ASSISTANT DISTRICT EDUCATIONAL INSPECTORS/
TEACHER GRADE –I (PHYSICS)
UNDER
DIRECTORATE OF EDUCATION
(Advt No. 04 Year 2023)

I. General English including Grammar - 05 marks

II. General Knowledge, Current Affairs and Events of National and International Importance - 10 marks

III. Logical Reasoning and Analytical Ability - 10 marks

IV. Core: - 50 marks

PART-I(30 Marks)

1. Physical world and measurement - Fundamental and derived units, systems of units, dimensional formula and dimensional equations, Accuracy and error in measurement.
2. Description of motion - motion in one dimension, uniformly accelerated motion, motion with uniform velocity/Acceleration in two dimensions, motion of an object in three dimensions, relative velocity.
3. Laws of motion - first, second and third law of motion, impulse, momentum, conservation of linear momentum.
4. Work, Energy and Power - Work done by a constant / variable force, K.E., P.E., Elastic collision in one and two dimensions, gravitational P.E., P.E. of a spring, conservation of energy, conservative and non-conservative forces, power.
5. Rotational motion - Centre of mass, its motion, rotational motion, Torque, angular momentum, centripetal force, circular motion, moment of inertia, theorems of M.I., Rolling motion.
6. Oscillatory motion - Periodic motion, S.H.M. its equation, K.E. and P.E., concept of free, forced and damped oscillations, simple pendulum, oscillation of a loaded spring.
7. Gravitation - Universal law of gravitation, variation of g, orbital and escape velocity, planetary motion, Kepler's law.
8. Elasticity - Hook's law, young's modulus, bulk modulus and shear modulus of rigidity. Applications of elastic behaviour of matter.
9. Surface tension - Fluid pressure, Pascal's law, Archimedes principle, molecular theory of surface tension, Excess of pressure inside a drop and soap bubble, angle of contact, Capilarity, Detergents.
10. Liquids in motion - Type of flow of liquid, Critical velocity, Coefficient of viscosity, Terminal velocity, Stoke's law, Reynold's number, Bernoulli's theorem - its applications.
11. Kinetic theory of gases - Laws for gases, Ideal gas equation, Assumptions of Kinetic theory of gases, Pressure exerted by a gas, Law of equipartition of energy, Degree of freedom, Specific heats of gases and solids, Mean free path.
12. Waves - Type of waves, wave equation, speed of a progressive wave, superposition principle, beats, stationary waves and normal modes, Doppler's effect.
13. Ray optics and optical instruments - Laws of reflection, Reflection by plane and curved mirrors, Laws of refraction, total internal refraction - applications, Lenses, Image formation by lenses, Dispersion by prism, Sattering of light, Eye, Defects of vision, Microscopes, Telescopes.
14. Electrostatics - Coulomb's law, electric field and potential due to a point charge and Dipole, concept of Dielectric, Gauss theorem - its applications, Electric lines of force, Force and torque experience by a dipole in uniform electric field,
15. Current Electricity - Ohm's Law, Temperature dependence of resistance, colour code of resistors, series and parallel combination of resistors, resistivity, primary and secondary cells and their combination in series and parallel, Kirchoff's laws, wheat stone bridge and potentiometer - their applications, electrical energy and power.
16. Wave Optics - Huygen's principle - reflection and refraction, Interference of light, young's double slit experiment, Diffraction of light, Single slit diffraction, resolving power of optical instruments, polarisation of light, law of malus. Polarization by reflection and scattering.
17. Photoelectric effect and matter waves - Einstein's Photoelectric equation, Photocell, matter waves, Debroglie's hypothesis, Davison and Germer's experiment.

18. Solids and semi conductor devices - Energy band in solids, Semi conductor, P-N Junction, Diodes, Diode as an rectifier, Special purpose p-n junction diodes, Junction transistor, Logic gates, integrated circuit.

Electromagnetic Waves and Communication – Displacement current, Electromagnetic Waves-Source, nature. Electromagnetic spectrum, Elements of a communication system, Bandwidth of signals and transmission medium, Sky and space wave propagation, Need for modulation, Production and detection of an AM wave.

PART-II (20 Marks)

I: The Teacher In The Emerging Indian Society

- Relationship between Philosophy and Education
- Educational Provisions in the Constitution of India
- Naturalism, Pragmatism, Humanism
- Socialization and Education - The role of family, peer group, school and the media of communication
- Education and Social Stratification
 - Inequalities of educational opportunity: religion, caste, class and gender
 - Social determinants of educability
 - The role of education in mobility
 - Education and Social Change

II: Psychology of the Learner and Learning

- The role of heredity and environment in development.
- Cognitive Development (Piaget)
- Characteristics of Adolescence (physical, mental/cognitive, emotional, social).
- Gardner's theory of multiple intelligences,
- Dealing with Individual Differences
 - Children with learning disabilities
 - Emotionally disturbed children
 - Gifted students
 - Fostering creativity in students

Information Processing (Sensory register, STM and LTM)

- Classroom implications of the Information Processing Theory
- Forgetting and causes of forgetting
- Constructivist view of learning
- Critical thinking
- Transfer of learning
- Classroom implications of the Cognitive Learning Theory
- Intrinsic and Extrinsic Motivation
- Classroom climate and group dynamics

III: Evaluation and Assessment

- Concept and Function of Educational Evaluation
 - Basic types of Evaluation
 - Placement, Formative Diagnostic, Summative Evaluation
- Phases of Evaluation
 - Collecting evidence...- Forming judgements - Taking decisions
- Taxonomy of Educational Objectives
 - Various steps of setting a question paper: Blue print, preparation of test items, review of test items, scoring key
- Need for grading
 - Direct grading versus indirect grading
 - Absolute grading versus relative grading
- Continuous Internal Assessment - Need, Areas, Advantages
- Portfolio Assessment

IV: Educational Technology

- Components of an Instructional System
- Application of Systems Approach to planning lessons and instructional Material.
 - Communication – meaning, modes and functions
 - Communication Process (Communication cycle)
- Barriers to communication and overcoming these barriers
- Kinds of Communication
 - Verbal communication - improving listening and speaking skills

- Non verbal Communication - Art, Forms, Symbols, Appearances and Body language (Touch, Facial expression, Eye contact).
- Improving non-verbal communication

Dale's cone of experiences

Computer assisted learning

-Subject specific software and its uses

-General educational software e.g. encyclopaedia

- Computers for simulation, drill/practice, educational games and tutorials

- Computer aided evaluation

- Advantages and Limitations in the use of computers

Note:

Duration for C.B.R.T : 90 Minutes

Maximum Marks for C.B.R.T : 75 Marks

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