

SYLLABUS FOR COMPUTER BASED RECRUITMENT TEST (CBRT)
FOR THE POST OF ASSISTANT DISTRICT EDUCATIONAL INSPECTORS/
TEACHER GRADE –I (CHEMISTRY)
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 **Atomic Structure** : Fundamental Particles, Modern concept of atomic structure, quantum numbers, Aufbau principle, Pauli's exclusion principle, Hund's Rules. Electronic configuration of elements, classification of elements and periodicity in properties, s, p, d and f Block elements.
- 2 **Transition Elements** : Transition elements, electronic configuration, absorption spectra including charge transfer spectra and magnetic properties, co-ordination compounds (Werner's theory). Nomenclature (IUPAC) Isomerism, Elementary M.O. approach for metallic bond and bond order. Conductors, insulators, semiconductors and super conductors.
- 3 **Lanthanides and Actinides** : Electronic configuration, oxidation states, Lanthanide and Actinide contraction, principles of isolation and application.
- 4 **Chemical Kinetics & Surface Chemistry** : Rate of chemical reaction, order of reaction, factors affecting rate of reactions, Physical adsorption and chemisorption, colloids and emulsions.
- 5 **Solutions Types of solutions**: solubility and concentrations, vapour pressure, Ideal and real solutions, properties and calculations of molar mass.
- 6 **Thermodynamics Laws of thermodynamics** : zeroth and first law and their applications, concept of work and heat, Gibb's energy, enthalpy and entropy.
- 7 **Alkanes, Alkenes, Dienes and Halo-alkanes** :Classification, nomenclature (R,S), methods of preparations and chemical reactions of alkanes, alkenes, alkadienes and haloalkanes.
- 8 **Aldehydes, Ketones, Carboxylic Acids and their derivatives** : Classification, nomenclature, methods of preparation, chemical reactions of aldehydes, ketones, carboxylic acids and their derivatives.
- 9 **Aromaticity and Arenes** : Aromaticity, Benzene, Alkyl-arenes, structure of benzene, electrophilic substitution reactions, orientation of functional groups.
- 10 **Bio-molecules**: Elementary treatment of carbohydrates, proteins, enzymes, vitamins & nucleic acids. 2 Part – II
- 11) **Chemical Bonding Theories of chemical bonding**, VB and MO theories of Diatomic molecules, VSEPR theory, Quantum mechanics, Schrodinger's wave equation for one electron system.
- 12) **Name Reactions** : Nucleophilic Addition reactions and mechanism of Aldol, Cannizzaro, Perkin, Stobbe, Benzoin, Reformatsky, Knoevenagel, Baeyer-Villiger, Wittig and Mannich reactions.
- 13) **Halo, Nitro, Amino-Arenes and Diazonium Salts** : Preparations, Chemical properties, elimination and addition mechanism and synthetic applications of diazonium salts.
- 14) **Polymers and Drugs Polymers**: Types of polymerization, natural and synthetic polymers. Drugs (antacids, anti-histamines, analgesics, antipyretics, antibiotics and antifertility).

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