

Syllabus for Recruitment Examination of Trained Graduate Teacher

SUBJECT: CHEMISTRY

Unit 1:- Atomic structure –

Dalton's atomic theory, elements, compound, cathode ray, x-ray, Rutherford Model of Atomic structure, Bohr's model of atomic structure. Electronic configuration: -rules for filling electrons in orbitals - Aufbau principle, Pauli Exclusion Principle and Hund's rule, electronic configuration of atoms, stability of half filled and completely filled orbitals. electronic configuration of elements upto atomic numbers thirty. Atomic number and mass number, isotopes and isobars.

Unit –II Periodic Classification of Elements :-

Early attempts at the classification of elements, Mendeleev's periodic table, the modern periodic table and position of elements. Periodic trends of properties in modern periodic table (valency, metallic and non-metallic properties), position of hydrogen in periodic table. Isotopes of Hydrogen, classification of elements into, s, p, d and f- blocks.

Unit- III Chemical Bonding and Chemical Reaction

Noble gas electronic configuration as criteria of stability of atom, Octet rule; atoms and ions, valency, electrovalent bond, covalent bond, Bond Energy, VSEPR theory: shape of molecules of simple molecules. Chemical reaction: types (decomposition, displacement, isomerisation, combination, redox and disproportionation reaction), chemical formula and chemical equation, Mole concept, atomic and molecular masses, gram atomic mass/unified mass, and gram molecular mass, determination of empirical and molecular formula, Balancing of chemical equation. Energy involved in a reaction, Photochemical reaction. Electrolysis of water and sodium chloride.

Unit –IV :- Acids, Bases and Salts :-

Various concept of Acids and Bases (Lewis, Bronsted-Lowry concept) Chemical properties of acids and bases, strong and weak acids and bases, pH – scale, action of acids and bases on indicator, pOH and pK_a: numerical related to pH, pOH and pK_a, important of pH in everyday life, pH of salts, preparations and uses of sodium hydroxide, bleaching powder, baking soda, washing soda and plaster of Paris.

Unit-V Metal and Non- Metal

Physical and Chemical properties of Metals and Non-metals, reactivity series, Reaction between metal and non-metal, properties of electrovalent compounds. Metals: occurrence, metallurgy (elementary idea), extraction of copper, iron, Aluminium, uses of metals, Alloys formation. Preparation and properties (of oxygen, silicon, phosphorus, sulphur).

Unit- VI: - Carbon and Its Compound –

Bonding in organic compounds, versatile nature of carbon, Hydrocarbon: saturated and unsaturated, homologous series, alkyl radicals. Nomenclature of hydrocarbon and its derivatives (halides, alcohols, aldehydes, ketones, carboxylic acids). Isomerism in alkanes, alkenes and alkynes. Alcohols: properties, uses (Methyl alcohol, ethyl alcohol). Polymers: natural and synthetic (Nylon, Polyester, Plastic, Rubber), soaps and detergents fuel; fossil fuel, coal, natural gas, classification of fuel, calorific value of fuel, ignition temperature, ideal fuel.