CHEMISTRY

CLASS-XI

SEMESTER-I

Unit-I: Some Basic Concept of Chemistry

General Introduction: Importance and scope of chemistry, Historical approach to particulate nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules. Atomic and molecular masses, Mole concept and molar mass: percentage composition, empirical and molecular formula; chemical reactions, stoichiometry and calculations based on stoichiometry.

Unit-II: Structure of Atom

Discovery of electron, proton and neutron; atomic number, isotopes and isobars. Thomson's model and its limitations, Rutherford's model and its limitations. Bohr's model and its limitations, concept of shells and sub-shells, dual nature of matter and light, De Broglie's relationship, Heisenberg uncertaint principle, concept of orbitals, quantum numbers, shapes of s, p, and d orbitals, rules for filling electronics in orbitals Aufbau principle, Pauli exclusion principle and Hund's rule, electronic configuration of atoms, stability of half filled and completely filled orbitals.

Unit-III: Classification of Elements and periodicity in Properties

Significance of classification, brief history of the development of periodic table, modern periodic law and the present form of periodic table, periodic trends in peorperties of elements atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electro negativity, valence.

Unit-IV: Chemical Bonding and Molecular Structure

Valence elctrons, ionic bond, covalent bond: bond parameters. Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory concept of hybridization, involving s, p and d orbitals and shapes of some simple molecules, molecular orbital; theory of homonuclear diatomic molecules qualitative idea only, hydrogen bond.

Unit-V: Hydrogen

Position of hydrogen in perodic table, occurrence, isotopes, preparations, properties and uses of Hydrogen; Hydrides-ionic, covalent and interstitial physical and chemical properties of water, Heavy water; Hydrogen peroxide-preparation reactions and structure; hydrogen as fuel

Unit-VI: s-Block Elements (Alkali and Alkaline earth metals)

Group 1 and Group 2 elements;

General introductions, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in chemical reactivity with osygen, water, hydrogen and halogens; uses.

Preparation and properties of some important compunds:-

Sodium carbonate, sodium chloride, sodium hydroxide and sodium hydrogen carbonate, biological importance of sodium and potassium.

CaO, $CaCO_3$ and industrial use of lime and limestone, biological importance of Mg and Ca.

Unit-VII: Organic Chemistry-Some Basic Principles and Techniques

General introduction method, qualitative and quantitative analysis. Classification and IUPAC nomenclature of organic compounds:

Electronic displacements in a covalent bond inductive effect, electronic, effect, resonance and hyper conjugation.

Homolytic and heterolytic fission of a covalent bond; free radicals, carbocations, carbanions; electrophiles and nucleophiles, types of organic reactions.