

CLASS - XII

SUBJECT : CHEMISTRY (CHEM)

SEMESTER – III

FULL MARKS : 35

CONTACT HOURS : 70 HOURS

COURSE CODE : THEORY

Sub-topics

UNIT No.	TOPICS	CONTACT HOURS	MARKS
Unit - 1	Liquid State Introduction, Solubility of gases in liquids, solid solutions, Vapour pressure and Raoult's law. Colligative properties; relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure. Determination of molecular mass using colligative properties. Abnormal molecular mass, van't Hoff factor and calculations involving it. Colloidal solution, the difference between true solutions, colloids and suspensions; lyophilic, lyophobic, multi-molecular colloids; properties of colloids; Tyndal effect, Brownian movement, electrophoresis, coagulation, emulsions and types of emulsions.	16	08
Unit - 2	p-Block Elements (Groups 15, 16, 17 and 18) Group 15 elements: general introduction, electronic configuration, occurrence, oxidation states, Structure and reaction of NH_3 , HNO_3 , NCl_3 , oxides of nitrogen (structure only); Phosphorus – allotropic forms(White and Red), preparation and properties of phosphine, phosphorus halides (PCl_3 , PCl_5) and oxoacids (elementary idea only) Group 16 elements: General introduction, electronic configuration, occurrence, oxidation states; Oxygen: classification of oxides. Preparation and properties of Ozone. Sulphur: allotropic forms (rhombic and monoclinic). Properties and uses of oxides, oxoacids and peracids of sulphur. Group 17 elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; Compounds of halogen; preparation, structure and uses of oxides, oxoacids of halogens, interhalogen compounds. Elementary idea of pseudohalogens and polyhalides. Group 18 elements : General introduction, electronic configuration, occurrence, uses of noble gases. Preparation, structure and chemical reactions of XeO_2 , XeO_3 , XeF_2 , XeF_4 , XeF_6 , XeOF_2 .	18	08

UNIT No.	TOPICS	CONTACT HOURS	MARKS
Unit - 3	Haloalkanes and Haloarenes Haloalkanes: Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions. Stability of carbocations. <i>R/S</i> and <i>D/L</i> configurations Uses and environmental effects of – dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, Haloarenes: Nature of C-X bond, substitution reaction (directive influence of halogen for monosubstituted compounds only), stability of carbocations, <i>R/S</i> and <i>D/L</i> configurations. Uses and environmental effects of DDT.	10	05
Unit - 4	Alcohols, Phenols and Ethers Alcohols: Nomenclature, methods of preparation, physical and chemical properties (primary alcohols only); identification of primary, secondary and tertiary alcohols; mechanism of dehydration, uses of methanol and ethanol. Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reaction, uses of phenol. Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses.	10	05
Unit - 5	Biomolecules : Carbohydrates Classification (aldoses and ketoses), monosaccharides (glucose and fructose), <i>D/L</i> configuration, oligosaccharides (sucrose), polysaccharides (starch, cellulose) Proteins Elementary idea of α -amino acids, peptide bonds, polypeptides, structure of proteins (primary structure only), denaturation of proteins; enzymes. Nucleic Acids: DNA & RNA (introduction and basic concept)	08	05
Unit - 6	Polymers: Classification- (natural and synthetic), methods of polymerization (addition and condensation), copolymerization. Some important polymers; like polythene, nylon, polyesters, bakelite, and rubber. Biodegradable and non-biodegradable polymers	08	04