

## CHEMISTRY: XII (2023-24)

### Syllabus

	<b>Marks</b>
<b>Part A: Theory</b>	
<ul style="list-style-type: none"><li><b>Solutions</b>  Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, Raoult's law, colligative properties - relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor.</li></ul>	07
<ul style="list-style-type: none"><li><b>Electrochemistry</b>  Redox reactions, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell-electrolytic cells and Galvanic cells, lead accumulator, fuel cells, corrosion.</li></ul>	09
<ul style="list-style-type: none"><li><b>Chemical Kinetics</b>  Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment), activation energy, Arrhenius equation.</li></ul>	07
<ul style="list-style-type: none"><li><b>d –and f –Block Elements</b>  General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of <math>K_2Cr_2O_7</math> and <math>KMnO_4</math>.  <b>Lanthanoids</b> - Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences.  <b>Actinoids</b> - Electronic configuration, oxidation states and comparison with lanthanoids.</li></ul>	07
<ul style="list-style-type: none"><li><b>Coordination Compounds</b>  Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory,</li></ul>	07

VBT, and CFT; structure and stereoisomerism, importance of coordination compounds (in qualitative analysis, extraction of metals and biological system).	
<ul style="list-style-type: none"> <li>• <b>Haloalkanes and Haloarenes</b></li> </ul> <p><b>Haloalkanes:</b> Nomenclature, nature of C–X bond, physical and chemical properties, optical rotation mechanism of substitution reactions.</p> <p><b>Haloarenes:</b> Nature of C–X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only). Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.</p>	06
<ul style="list-style-type: none"> <li>• <b>Alcohols, Phenols and Ethers</b></li> </ul> <p><b>Alcohols:</b> Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses with special reference to methanol and ethanol.</p> <p><b>Phenols:</b> Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols.</p> <p><b>Ethers:</b> Nomenclature, methods of preparation, physical and chemical properties, uses.</p>	06
<ul style="list-style-type: none"> <li>• <b>Aldehydes, Ketones and Carboxylic Acids</b></li> </ul> <p><b>Aldehydes and Ketones:</b> Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses.</p> <p><b>Carboxylic Acids:</b> Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.</p>	08
<ul style="list-style-type: none"> <li>• <b>Amines</b></li> </ul> <p><b>Amines:</b> Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.</p> <p><b>Diazonium salts:</b> Preparation, chemical reactions and importance in synthetic organic chemistry.</p>	06
<ul style="list-style-type: none"> <li>• <b>Biomolecules</b></li> </ul> <p><b>Carbohydrates</b> - Classification (aldoses and ketoses), monosaccharides (glucose and fructose), D-L configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates.</p>	07

<p><b>Proteins</b> -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes. Hormones - Elementary idea excluding structure.</p> <p><b>Vitamins</b> - Classification and functions.</p> <p><b>Nucleic Acids:</b> DNA and RNA.</p>	
	<i>70</i>
<b>Part B: Practicals</b>	
• <b>Volumetric Analysis</b>	08
• <b>Salt Analysis</b>	08
• <b>Content Based Experiment</b>	06
• <b>Project Work</b>	04
• <b>Class record and viva</b>	04
	<i>30</i>
<b>TOTAL</b>	<b>100</b>