



Curriculum
Subject : Chemistry (043)
Session : 2023-24
Class : XII

EVALUATION SCHEME		
Theory		
S.No.	TITLE	Marks
1	Solutions	7
2	Electrochemistry	9
3	Chemical Kinetics	7
4	d- and f-Block Elements	7
5	Coordination Compounds	7
6	Haloalkenes and Haloarenes	6
7	Alcohols, Phenols and Ethers	6
8	Aldehydes, Ketones and Carboxylic acids	8
9	Amines	6
10	Biomolecules	7
	TOTAL	70

UNIT	MONTH	LEARNING OBJECTIVES	PRACTICAL AND COMPETENCY SKILL BASED ACTIVITIES / EXPERIENTIAL LEARNING	Skills	ASSESSMENT
Unit I: Solutions	March - April	Students will be able to <ul style="list-style-type: none">Describe the types of solutionsDerive the expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutionsElaborate Raoult's lawCategorise and derive the colligative properties -relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressureDetermine the molecular masses using colligative properties.Understand the abnormal molecular masses and Van't Hoff factor	Determination of concentration/ molarity of KMnO_4 solution by titrating it against a standard solution of: i) Oxalic acid, ii) Ferrous Ammonium Sulphate (Students will be required to prepare standard solutions by weighing themselves).	Knowledge, Understanding, Application, Analysis and Evaluation	Diagram based analysis. Pen paper test Solving Numerical

Unit II: Electro - chemistry	May	<p>Students will be able to</p> <ul style="list-style-type: none"> • Understand Redox reactions, EMF of a cell, standard electrode potential • Derive the Nernst equation and write its application to chemical cells • Relate Gibbs energy change and EMF of a cell • Understand conductance in electrolytic solutions, specific and molar conductivity • Know the variations of conductivity with concentration, Kohlrausch's Law, electrolysis. • Understand the working and functioning of dry cell-electrolytic cells and Galvanic cells, lead accumulator and fuel cells • Study the mechanism of corrosion 	<p>Scientific investigations involving laboratory testing and collecting information from other sources. A few suggested Projects.</p> <p>*To Study the presence of oxalate ions in guava fruit at different stages of ripening.</p> <p>*To Study the quantity of casein present in different samples of milk.</p> <p>*Preparation of soyabean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.</p> <p>*Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.)</p> <p>*Study of digestion of starch by salivary amylase and effect of pH and temperature on it.</p> <p>*Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc.</p> <p>*Extraction of essential oils present in Saunf (aniseed), Ajwain (carum), Illaichi (cardamom).</p> <p>*Study of common food adulterants in fat, oil, butter, sugar, turmeric powder, chili powder and pepper.</p>		<p>Logical reasoning. Conceptual questions. SA/VSA questions pen paper test.</p>
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Unit III: Chemical Kinetics	May-June	<p>Students will be able to</p> <ul style="list-style-type: none"> • Write expression for Rate of a reaction (Average and instantaneous) • Categorise factors affecting rate of reaction: concentration, temperature, catalyst; • Deduce the order and molecularity of a reaction, • Understand the rate law and specific rate constant, • Write the integrated rate equations and half-life (only for zero and first order reactions). • Understand the concept of collision theory and activation energy • Write and solve the numericals based on arrhenius equation 		Knowledge, Understanding, Application, Analysis and Evaluation	MCQ. Numerical solving skills. Pen paper test.
Unit IV: d and f Block Elements	July	<p>STudents will be able to</p> <ul style="list-style-type: none"> • Understand the general introduction, electronic configuration, occurrence and characteristics of transition metals • Know the 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. • Understand Lanthanoids -Electronic configuration, oxidation states and lanthanoid contraction and its consequences. • Understand Actinoids -Electronic configuration, oxidation states and comparison with lanthanoids. 	<p>Qualitative analysis Determination of one cation and one anion in a given salt. Cation - Pb^{2+}, Cu^{2+}, As^{3+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Zn^{2+}, Cu^{2+}, Co^{2+}, Ni^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+.</p> <p>Anions - S^{2-}, SO_4^{2-}, NO_3^-, CO_3^{2-}, Br^-, Cl^-, I^-, PO_4^{3-}, CHCOO^-, $\text{C}_2\text{O}_4^{2-}$. PROJECT</p>	Knowledge, Understanding, Application, Analysis and Evaluation	Equation based. Logical reasoning based questions. Conceptual questions.
Unit V: Coordination Compounds	July	<p>Students will be able to</p> <ul style="list-style-type: none"> • Understand ligands, coordination number, colour, magnetic properties and shapes, • Write the IUPAC names of mononuclear coordination compounds. • Understand the Werner's theory, VBT, and CFT. • Draw the structure and stereoisomerism and understand the importance of coordination compounds (in qualitative analysis, extraction of metals and biological system). 	<p>Preparation of Inorganic Compounds Preparation of double salt of Ferrous Ammonium Sulphate or Potash Alum. Preparation of Potassium Ferric Oxalate.</p>	Knowledge, Understanding, Application, Analysis and Evaluation	MCQ. Logical reasoning based questions. Conceptual questions. Pen paper test

Unit VI: Haloalkanes and Haloarenes.	August	Haloalkanes: Students will be able to <ul style="list-style-type: none"> Name and understand the nature of C–X bond, physical and chemical properties Understand the optical rotation mechanism of substitution reactions. Haloarenes: <ul style="list-style-type: none"> Know the nature of C–X bond Understand the substitution reactions (Directive influence of halogen in monosubstituted compounds only). Understand the Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT. 		Knowledge, Understanding, Application, Analysis and Evaluation	Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions.
Unit VII: Alcohols, Phenols and Ethers	August	Alcohols: <ul style="list-style-type: none"> Understand the methods of preparation, physical and chemical properties (of primary alcohols only) Identify of primary, secondary and tertiary alcohols Know the mechanism of dehydration, uses with special reference to methanol and ethanol. Phenols: <ul style="list-style-type: none"> Understand the methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols. Ethers: Understand the methods of preparation, physical and chemical properties, uses.	Tests for the functional groups present in organic compounds: Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) groups. Characteristic tests of carbohydrates, fats and proteins in pure samples and their detection in given food stuffs.	Knowledge, Understanding, Application, Analysis and Evaluation	Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions. Pen paper test
Unit VIII: Aldehydes, Ketones and Carboxylic Acids	September	Aldehydes and Ketones: <ul style="list-style-type: none"> Students will be able to Understand the nature of carbonyl group, methods of preparation, physical and chemical properties Write the mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses. Carboxylic Acids: Students will be able to <ul style="list-style-type: none"> Understand the acidic nature, methods of preparation, physical and chemical properties; uses. 		Knowledge, Understanding, Application, Analysis and Evaluation	VS/VSA questions Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions. Pen paper test

Unit IX: Amines	October	Amines: Students will be able to <ul style="list-style-type: none"> Understand the Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses Identify primary, secondary and tertiary amines. Identify primary, secondary and tertiary amines Understand Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry. 		Knowledge, Understanding, Application, Analysis and Evaluation	Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions.
Unit X: Biomolecules	October	Carbohydrates Students will be able to <ul style="list-style-type: none"> Classify (aldoses and ketoses), monosaccharides (glucose and fructose) Specify D-L configuration for oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen) Study the Importance of carbohydrates. Proteins <ul style="list-style-type: none"> Have an elementary idea of -amino acids, peptide bond, polypeptides, proteins Draw the structure of proteins primary, secondary, tertiary structure and quaternary structures (qualitative idea only) Understand Denaturation of proteins. Define enzymes and Hormones - Elementary idea Classify and write the functions of vitamins. Understand Nucleic Acids: DNA and RNA 		Knowledge, Understanding, Application, Analysis and Evaluation	VSA/Conceptual questions to enhance their reasoning and structural skill.

Practical Evaluation Scheme:

S.No.	Practical	Marks
1	Volumetric Analysis	08
2	Salt Analysis	08
3	Content Based Experiment	06
4	Project Work	04
5	Class record and viva	04
	Total	30