Cambridge INTERNATIONAL SCHOOL KULLU

Curriculum
Subject: Chemistry (043)
Class: XII
Session: 2024-25

EVALUATION SCHEME		
Theory		
Units	**Title**	**Marks**
I	Solutions	7
II	Electrochemistry	9
III	Chemical Kinetics	7
IV	d- and f-Block Elements	7
V	Coordination Compounds	7
VI	Haloalkenes and Haloarenes	6
VII	Alcohols, Phenols and Ethers	6
VIII	Aldehydes, Ketones and Carboxylic acids	8
IX	Amines	6
X	Biomolecules	7
	Total	**70**

UNIT/ MONTH	LEARNING OUTCOMES	PRACTICAL AND COMPETENCY SKILL BASED ACTIVITIES / EXPERIENCIAL LEARNING	SKILLS	ASSESSMENT
Unit I: Solutions April	Students will be able to ● Describe the types of solutions ● Derive the expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions ● Elaborate Raoult's law ● Categorise and derive the colligative properties -relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure ● Determine 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). **Visit to Bio Fermenta**	Knowledge, Understanding, Application, Analysis and Evaluation	Diagram based analysis. Pen paper test Solving Numerical
Unit II: Electro - Chemistry May	Students will be able to ● 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	Scientific investigations involving laboratory testing and collecting information from other sources. A few suggested Projects. *To Study the presence of oxalate ions in guava fruit at different stages of ripening. *To Study the quantity of casein present in different samples of milk. *Preparation of soyabean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc. *Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.) *Study of digestion of starch by salivary amylase and effect of pH and temperature on it. *Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc. *Extraction of essential oils present in Saunf (aniseed), Ajwain (carum), Illaichi (cardamom). *Study of common food adulterants in fat, oil, butter, sugar, turmeric powder, chili powder and pepper.	Knowledge, Understanding, Application, Analysis and Evaluation	Logical reasoning. Conceptual questions. SA/VSA questions pen paper test.

Unit III: Chemical Kinetics May-June	Students will be able to ● 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	Decomposition of substances based upon its half life period.	Knowledge, Understanding, Application, Analysis and Evaluation	MCQ. Numerical solving skills. Pen paper test.
Unit IV: d and f Block Elements July	Students will be able to ● 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. ● Properties of $K_2Cr_2O_7$ and $KMnO_4$	Qualitative analysis Determination of one cation and one anion in a given salt. Cation - Pb^{2}, Cu^{2+} As^{3+}, $A\ell^{3+}$, Fe^{3+}, Mn^{2+}, Zn^{2+}, Cu^{2+}, Co^{2+}, Ni^{2+}, Ca^{2}, Sr^{2}, Ba^{2+}, Mg^{2+}, NH_4^{+} . Anions - S^{2-}, SO_4^{2-}, NO_3^{-}, CO_3^{2-}, Br^{-}, Cl^{--}, I^{-}, PO_4^{3}, $CHCOO^{-}$, $C_2O_4^{2-}$. PROJECT	Knowledge, Understanding, Application, Analysis and Evaluation	Equation based. Logical reasoning based questions. Conceptual questions.
Unit V: Coordination Compounds July	Students will be able to ● 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)	Preparation of Inorganic Compounds Preparation of double salt of Ferrous Ammonium Sulphate or Potash Alum. Preparation of Potassium Ferric Oxalate.	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 ● Name and understand the nature of C–X bond, physical and chemical properties ● Understand the optical rotation mechanism of substitution reactions **Haloarenes**: ● 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	**Visit to Catch Factory.**	Knowledge, Understanding, Application, Analysis and Evaluation	Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions.
Unit VII: Alcohols, Phenols and Ethers	**Alcohols**: ● 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**: ● Understand the methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols **Ethers**: Understand the methods of preparation, physical and chemical properties and its 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:** ● Students will be able to Understand the nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties ● Write the mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes and its uses. **Carboxylic Acids**: Students will be able to ● Understand the acidic nature, methods of preparation, physical and chemical properties and its uses.	Test for the functional group present in organic compound.	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 ● Understand the nomenclature, classification, structure, methods of preparation, physical and chemical properties and its uses ● Identify primary, secondary and tertiary amines. ● Understand diazonium salts, preparation, chemical reactions and importance in synthetic organic chemistry.	**Visit to Bio Fermenta**	Knowledge, Understanding, Application, Analysis and Evaluation	Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions.

Unit X: Biomolecules October-November	**Carbohydrates** Students will be able to ● 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** ● Have an elementary idea of -amino acids, peptide bond, polypeptides and 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	Test for the functional group present in carbohydrates, proteins and fats.	Knowledge, Understanding, Application, Analysis and Evaluation	VSA/ Conceptual questions to enhance their reasoning and structural skill.

PRACTICAL

Sr. No.	Evaluation Scheme	Marks
1	**Volumetric Analysis**	**8**
2	**Salt Analysis**	**8**
3	**Content Based Experiment**	**6**
4	**Project Work**	**4**
5	**Class record and viva**	**4**
	Total	**30**

Sr. No.	Books	Publisher
1	Chemistry - I	NCERT
2	Chemistry - II	NCERT
3	Lab Manual	Evergreen