Cambridge INTERNATIONAL SCHOOL KULLU

Curriculum
Subject: Chemistry (043)
Class - XI
Session: 2026-27

EVALUATION SCHEME		
Theory		
S.No.	**TITLE**	**Marks**
1	Some Basic Concepts of Chemistry	**7**
2	Structure of Atom	**9**
3	Classification of Elements and Periodicity in Properties	**6**
4	Chemical Bonding and Molecular Structure	**7**
5	Chemical Thermodynamics	**9**
6	Equilibrium	**7**
7	Redox Reactions	**4**
8	Organic Chemistry: Some basic Principles and Techniques	**11**
9	Hydrocarbons	**10**
	TOTAL	**70**

UNIT	MONTH	LEARNING OUTCOMES	PRACTICAL AND COMPETENCY SKILL BASED ACTIVITIES / EXPERIENTIAL LEARNING	Skills	ASSESSMENT
Unit I: Some Basic Concepts of Chemistry	April	Students will be able to ● Describe the importance and scope of Chemistry. ● Know the nature of matter. ● Mathematically describe the laws of chemical combination ● Describe Dalton's atomic theory: concept of elements, atoms and molecules. ● Define Atomic and molecular masses. ● Describe and solve the numericals based on mole concept and molar mass. ● Depict the percentage composition, empirical and molecular formula of the given compound. ● Write the chemical reactions, stoichiometry and calculations based on stoichiometry.	Preparation of standard solution of Oxalic acid. Preparation of standard solution of Sodium carbonate. Visit to waste water treatment plant.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation,use of tool and technology,data collection and recordings Communication skills: Scientific communication,team work,listening and interpretation Academic and career readiness: Scientific literacy, preparation for STEM careers	Diagram based analysis.Pen paper test Solving Numerical
Unit II: Structure of Atom	April-May	Students will be able to ● Know the discovery of Electron, Proton and Neutron. ● Define atomic number, isotopes and isobars. ● Describe Thomson's model and its limitations. Rutherford's model and its limitations, Bohr's model and its limitations. ● Know about the concept of shells and subshells ● Describe dual nature of matter and light ● Derive de-Broglie's relationship, Heisenberg uncertainty principle ● Describe the concept of orbitals, quantum numbers. ● Draw the shapes of s, p and d orbitals ● Apply the rules for filling electrons in orbitals w.r.t. Aufbau principle, Pauli's exclusion principle and Hund's rule ● Depict the electronic configuration of atoms ● Explain the stability of half-filled and completely filled orbitals.	Determination of strength of a given solution of Sodium hydroxide by titrating it against the standard solution of Oxalic acid.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation,use of tool and technology ,data recordings Communication skills: Scientific communication, listening and interpretation Emotional and social development: Curiosity and exploration,patience and perseverance Academic and career readiness: Scientific literacy,interdisciplin–ary learning	Logical reasoning. Conceptual questions,pen paper test.

Unit III: Classification of Elements and Periodicity in Properties	June-July	Students will be able to ● Signify the classification, brief history of the development of periodic table ● Learn modern periodic law and the present form of periodic table ● Describe the periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency. ● Name the elements with atomic number greater than 100.	Design a periodic table.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation,use of tools and technology,data recordings Communication skills: Scientific communication Emotional and social development: Curiosity and exploration, patience and perseverance Academic and career readiness: Scientific literacy, interdisciplinary learning, preparation for STEM careers	MCQ, Numerical solving skills. Pen paper test.
Unit IV: Chemical Bonding and Molecular Structure	July -Aug	Students will be able to ● Describe Valence electrons, ionic bond, covalent bond and bond parameters ● Draw the Lewis's structure of compounds. ● Explain polar character of covalent bond and covalent character of ionic bond ● Describe valence bond theory ● Define resonance ● Draw the geometry of covalent molecules ● Describe VSEPR theory and concept of hybridization,involving s, p and d orbitals and shapes of some simple molecules ● Describe molecular orbital theory of homonuclear diatomic molecules (qualitative idea only) ● Define Hydrogen bond.	Qualitative analysis Determination of one cation and one anion in a given salt. Cation - Pb^{2}, Cu^{2+} As^{3+}, A₹$^{3+}$, 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} , $CH3COO^{-}$, $C_2O_4^{2-}$ CH3COO-, NO3-.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation,use of tools and technology,data recordings Communication skills: Scientific communication Emotional and social development: Curiosity and exploration, patience and perseverance Academic and career readiness: Scientific literacy, interdisciplinary learning, preparation for STEM careers	Equation based. Logical reasoning based questions. Conceptual questions.

Unit V: Chemical Thermodynamics	August	Students will be able to ● Describe Concepts of System ● Define the types of systems,surroundings, work, heat, energy, extensive and intensive properties, state functions. ● Describe First law of thermodynamics ● Define internal energy and enthalpy, heat capacity and specific heat ● Measure ΔU and ΔH ● Describe Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. ● Define Second law of Thermodynamics (brief introduction) ● Explain entropy as a state function ● Write Gibb's energy change for spontaneous and non-spontaneous processes ● Explain criteria for equilibrium. ● Define Third law of thermodynamics (brief introduction).		Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Communication skills: Scientific communication Emotional and social development: Curiosity and exploration, patience and perseverance Academic and career readiness: Scientific literacy, interdisciplinary learning, preparation for STEM careers	MCQ. Logical reasoning based questions. Conceptual questions. Pen paper test
Unit VI: Equilibrium	September	Students will be able to ● Define Equilibrium in physical and chemical processes ● Explain dynamic nature of equilibrium ● Describe law of mass action, equilibrium constant ● Describe factors affecting equilibrium - Le Chatelier's principle, ionic equilibrium-ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength ● Calculate the pH ,hydrolysis of salts (elementary idea) ● Explain buffer solution, Henderson Equation, solubility product, common ion effect (with illustrative examples).	Determination of strength of a given solution of hydrochloric acid by titrating it against the standard Sodium Carbonate solution.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation,use of tools and technology,data recordings Communication skills: Scientific communication Emotional and social development: Curiosity and exploration, patience and perseverance Academic and career readiness: Scientific literacy, interdisciplinary learning, preparation for STEM careers	Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions.

Unit VII: **Redox Reactions**	September	Students will be able to ● Describe Concept of oxidation and reduction, redox reactions. ● Calculate the oxidation number ● Balance the redox reactions, in terms of loss and gain of electrons and change in oxidation number ● Know the applications of redox reactions.	Various redox reactions practically shown to students in lab.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: use of tools and technology,data recordings Communication skills: Scientific communication Emotional and social development: Curiosity and exploration, patience and perseverance Academic and career readiness: Scientific literacy, interdisciplinary learning, preparation for STEM careers	Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions. Pen paper test
Unit VIII: **Organic Chemistry: Some basic Principles and Techniques**	Oct-Nov	Students will be able to ● Describe methods of purification, qualitative and quantitative analysis of organic compounds. ● Classify and write IUPAC nomenclature of organic compounds. ● Describe Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyperconjugation. ● Differentiate Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles ● Classify the types of organic reactions.	Visit to Fermanta.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Communication skills: Scientific communication Emotional and social development: Curiosity and exploration, patience and perseverance Academic and career readiness: Scientific literacy, interdisciplinary learning, preparation for STEM careers	Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions. Pen paper test

Unit IX: Hydrocarbons	Novr-Dec	**Aliphatic Hydrocarbons:** Students will be able to ● Describe Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis. ● Describe Alkenes - Nomenclature, the structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markovnikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition. ● Describe Alkynes - Nomenclature, the structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of -hydrogen, halogens, hydrogen halides and water. **Aromatic Hydrocarbons:** Students will be able to ● Write IUPAC nomenclature ● Describe benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution. Nitration, sulphonation, halogenation, Friedel Crafts alkylation and acylation, directive influence of the functional group in monosubstituted benzene. ● Explain Carcinogenicity and toxicity.	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.	Cognitive skills: Critical thinking, problem solving, observation and analysis, research skills Practical and technical skills: Experimentation,use of tools and technology,data recordings Communication skills: Scientific communication Emotional and social development: Curiosity and exploration, patience and perseverance Academic and career readiness: Scientific literacy, interdisciplinary learning, preparation for STEM careers	Equation based worksheet. MCQ. Logical reasoning based questions. Conceptual questions.

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