RUBY PARK PUBLIC SCHOOL

SYLLABUS FOR THE ACADEMIC SESSION 2022-23

Subject - Chemistry

CLASS - XI

Month	Unit No.	Chapter	Contents
June	1	Some Basic Concepts of Chemistry	• Importance and scope of Chemistry, nature of matter • laws of chemical combination, Nature of matter, Dalton's atomic theory: concept of elements, atoms and molecules. Atomic and molecular masses • mole concept and molar mass • percentage composition, empirical and molecular formula • chemical reactions, stoichiometry and calculations based on stoichiometry reactions • Concept of oxidation and reduction, redox, oxidation number, • balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number.
July	2	Structure of Atom	• Discovery of electrons, proton, neutron, atomic number, isotopes, isobars • Thomson model, limitation, Rutherford model, limitation • Bohr's model and its limitations. • concept of shells and subshells • dual nature of matter and light, de Broglie's relationship • Heisenberg uncertainty principle • concept of orbitals, quantum numbers, shapes of s, p and d orbitals • rules for filling electrons in orbitals - Aufbau principle, Pauli's exclusion principle and Hund's rule • electronic configuration of atoms, stability of half-filled and completely filled orbitals.

July		UT - 1	
July	3	Classification of Elements and Periodicity in Properties	• Significance of classification, brief history of development of periodic table. • Modern periodic law and the present form of periodic table • Periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency • Nomenclature of elements with atomic number greater than 100
	4	Chemical Bonding and Molecular structure	• Valence electrons, ionic bond, covalent bond, bond parameters, Lewis structure • polar character of covalent bond, covalent character of ionic bond • valence bond theory, resonance • geometry of covalent molecules, VSEPR theory • concept of hybridization, involving s, p and d orbitals and shapes of some simple molecules • molecular orbital theory of homonuclear diatomic molecules (qualitative idea only), hydrogen bond.
August	5	Chemical Thermodynamics	• Concepts of System and types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions. • First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat, measurement of ΔU and ΔH. • Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. • Second law of Thermodynamics (brief introduction). Introduction of entropy as a state function, Gibb's energy change for spontaneous and non- spontaneous processes, criteria for equilibrium. • Third law of thermodynamics (brief introduction).
September		Revision and BT-1	
October		Equilibrium	• Equilibrium in physical and chemical processes, dynamic nature of equilibrium • law of mass action, equilibrium constant • factors affecting equilibrium - Le Chatelier's principle
November	6	Equilibrium contd.	• Ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength, concept of pH • Henderson Equation, hydrolysis of salts (elementary idea), buffer solution, solubility product, commonion effect (with illustrative examples).
	7	Organic Chemistry - Some Basic Principles and Techniques.	Classification and IUPAC nomenclature of organic compounds. Isomerism.
December		UT - 2	

December	7	Organic Chemistry - Some Basic Principles and Techniques. (continued)	• Electronic displacements in a covalent bond: inductive effect, electrometric effect, resonance and hyper conjugation. • Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.
January	8	Hydrocarbons	• Alkanes - Nomenclature, isomerism, conformation (ethane only), • physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis. • Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation • chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markownikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition. • Alkynes - Nomenclature, 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: Introduction, IUPAC nomenclature, benzene: resonance, aromaticity, • chemical properties: mechanism of electrophilic substitution. Nitration, sulphonation,
	9	Redox Reactions	Concept of Oxidation and reduction, redox reactions, oxidation number, mbalancing redox reactions, applications of redox reactions.
February			Revision & Block Test -2