ARMY PUBLIC SCHOOL RAKHMUTHI
SYLLABUS OF CHEMISTRY (SPLIT-UP)
CLASS-XI (SESSION 2023-24)

MONTHS	UNIT	CONTENT	ACTIVITIES
APRIL	**Unit I:** **Some Basic Concepts of Chemistry**	➢ General Introduction: Importance and scope of chemistry. ➢ Nature of matter, laws of chemical combination, ➢ 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.	**TAL ACTIVITIES:** **To show the ppt based on Some Basic Concepts of Chemistry** To show the ppt based on scope of Chemistry
MAY	**Unit II: Structure of Atom**	➢ Discovery of Electron, Proton and Neutron, ➢ atomic number, isotopes and isobars. ➢ Thomson's model and its limitations. ➢ Rutherford's model and its limitations, ➢ Bohr's model and its limitations, ➢ concept of shells and sub shells, ➢ dual nature of matter and light, de Broglie's relationship, ➢ Heisenberg uncertainty principle, ➢ concept of orbital, ➢ quantum numbers, shapes of s, p and dorbital, ➢ rules for filling electrons in orbital -Aufbau principle, ➢ Pauli's exclusion principle and Hund's rule, ➢ electronic configuration of atoms, ➢ stability of half filled and completely filled orbitals	**TAL ACTIVITIES:** **To show the ppt based on Discoveries of atomic models** **To show the animated videos based on Discoveries of atomic orbitals**
JUNE **UT-1**	**Unit III: Classification of Elements and Periodicity in Properties** **SYLLABUS OF UT-1:** **UNIT-1&2**	➢ Significance of classification, ➢ brief history of the 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, electro negativity, valency ➢ Nomenclature of elements with atomic number greater than 100	**LAB. ACTIVITIES:** **EXPERIMENT1:** **P**reparation of standard solution of oxalic acid **EXPERIMENT2:**Determination of strength of a given solution of sodium hydroxide by titrating it with standard solution of oxalic acid
JULY	**Unit IV: 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.	**LAB. ACTIVITIES:** **EXPERIMENT** 3.Determination of m.pt.of an organic compound **EXPERIMENT** 4.Determination of boiling point of an organic compound
AUGUST	**Unit V: Chemical Thermodynamic**	➢ 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,	**LAB. ACTIVITIES:** 5.To prepare crystals of potash alum from crude sample

HALF YEARLY EXAM	**s** **REVISION OF SYLLABUS OF H.Y-:1,2,3,4 & 5**	➢ 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)	6. To prepare crystals of copper sulphate from crude sample **TAL ACTIVITIES:** **To show the ppt based on Entropy** **To show the videos based on** Hess's law
SEPTEMBER	**Unit 6: Equilibrium**	➢ Equilibrium in physical and chemical processes, dynamic nature of equilibrium, ➢ law of mass action, equilibrium constant, 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, concept of pH,Henderson Equation, ➢ hydrolysis of salts (elementary idea), ➢ buffer solution, solubility product, ➢ common ion effect (with illustrative examples)	**TAL ACTIVITIES:** **To show the ppt based on** hydrolysis of salts **To show the videos based on** common ion effect
OCTOBER	**Unit 7: Redox Reaction** **Unit 8: Organic Chemistry - Some Basic Principles and Technique**	➢ Concept of oxidation and reduction, redox reactions, oxidation number, ➢ balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number, ➢ applications of redox reactions. ➢ General introduction, ➢ methods of purification, qualitative and quantitative analysisanalysis ➢ classification and IUPAC nomenclature of organic compounds. ➢ Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation. ➢ Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, ➢ types of organic reactions.	**LAB. ACTIVITIES:** 7.Determination of pH of some solution obtained from fruit juice using pH paper 8.To determine one anion and one cation in the given salt
***N*OVEMBER**	**Unit 9: Hydrocarbons**	➢ Classification of Hydrocarbons:Aliphatic Hydrocarbons: ➢ **Alkanes** - Nomenclature, isomerism, conformation of ethane ➢ physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis. ➢ **Alkenes** - Nomenclature, structure of double bond, 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.	**LAB. ACTIVITIES:** 9.Detection of extra elements in in a given organic compound
DECEMBER	**Unit 9: Hydrocarbons**	➢ **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.	**TAL ACTIVITIES:** **To show the ppt based on** Classification of Hydrocarbons

UNIT TEST-*2*	**(CONTINUED.)** **<u>SYLLABUS OF UT-II</u>:6,7 &8**	➢ **Aromatic Hydrocarbons**: Introduction, IUPAC nomenclature, ➢ benzene: resonance, aromaticity, ➢ **chemical properties:** mechanism of electrophilic substitution. nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, ➢ directive influence of functional group in monosubstitutedbenzene,Carcinogenicity and toxicity.	**<u>To show the videos based on</u>** <u>mechanism of electrophilic substitution reactions</u>
JANUARY		➢ **<u>REVISION OF SYLLABUS FOR TERM-II:</u>UNIT**: **1-9**	**LAB ACTIVITIES(1-9)**
FEBRUARY **FINAL EXAM**	**<u>SYLLABUS :</u>** **UNIT**: **1-9**		**LAB ACTIVITIES(1-9)**