KENDRIYA VIDYALAYA SANGATHAN DELHI REGION

SPLIT–UP SYLLABUS SESSION 2022-23

CLASS: XI **SUBJECT: CHEMISTRY (043)**

MONTH	NO. OF WORKING DAYS (As per KVS)	NO. OF PERIODS required	Name of the chapter	Activities suggested to attain TLO	Remarks, if any
JULY 2022	**15**	**18**	**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.	• MOLE MAPPING • KINESTHETIC –HANDS ON ACTIVITY (Culinary Art) for stoichiometric calculations • EXPERIMENTATION /DEMONSTRATION METHOD: Understanding Stoichiometric calculation and Limiting reagent concept by performing a series of reactions • Digital balance for law of conservation of mass.	
AUGUST 2022	**22**	**20**	**Unit II: Structure of Atom** Discovery of Electron, Proton and Neutron, atomic number, isotopes and Isobars, Thomson's model and it's limitations. Rutherford's model and It's limitations. 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,	• Pictures/video clips of important scientist/ events that contributed to our knowledge of the structure of atom.	

		12	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. **<u>Unit III : Classification of Elements & Periodicity in Properties</u>** Significance of classification, brief history of the development of periodic table. Modern periodic law and the present form of periodic table,	● Posters on History of Atom information ● Group activity to understand electronic configuration. ● showing comparative history of various attempts for classification of elements ● activity to classify given unknown elements with cards ● explaining periodic table and its trends with the help of periodic table ● practice nomenclature of elements with atomic number greater than 100	
September 2022	**24**		**<u>Unit III: Classification of Elements & Periodicity in Properties (contd.)</u>** 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 **<u>PERIODIC TEST – 1 CLASS XI</u>** **<u>Unit IV : Chemical bonding and molecular structure</u>**		

		20	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.	• Build models of ionic and covalent compounds using balls and stick Compare two visually similar substances, salt and sugar in the lab. • To Understand ionic and covalent compounds Construct physical models of molecules to understand VSEPR modelling. VSEPR and balloon activity. • Chemistry of Hand sanitizer and soap to understand various interactive forces. (Connection of chemistry and current events) • Kinaesthetic game to experience chemical bonding and identify types of bonds	
October 2022	**15**	**9**	**<u>Unit IV: Chemical bonding and molecular structure (continued.)</u>** Molecular orbital theory of homonuclear diatomic molecules (qualitative idea only), hydrogen bond. **<u>Unit VI: Chemical Thermodynamics</u>** 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,	• Concept mapping. • Various enthalpy changes can be made understood by correlating with real life. • Demonstration for exothermic	

			sublimation, phase transition, ionization, solution and dilution.	and endothermic reaction. ● Numerical problems related to enthalpy, internal energy changes and free energy.	
NOVEMBER 2022	**23**	**14** **20**	**<u>Unit VI : Chemical Thermodynamics (CONTD.)</u>** 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) **REVISION & HALF YEARLY CLASS XI** **<u>Unit VII: Equilibrium</u>** Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant. 20 23 4 Factors affecting equilibrium- Le Chatelier's principle, ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization,		**Syllabus for half yearly examination** **<u>Unit I : Some basic concepts of Chemistry</u>** **<u>Unit II : Structure of Atom</u>** **<u>Unit III : Classification of Elements & Periodicity in Properties</u>** **<u>Unit IV : Chemical bonding and molecular structure</u>** **<u>Unit VI : Chemical Thermodynamics</u>**
DECEMBER 2022	**17**		**<u>Unit VII: Equilibrium</u>** 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).	● Activity to explain concept of dynamic equilibrium ● activity on Le Chatliers principle	

		9	**Unit VIII: Redox reactions** 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	• comparative study of various concepts of acids and bases • practice of numerical with worksheets • discussions on various applications of concept of buffer solutions and common ion effect from practical's and day to day life • concept mapping • correlation with redox titrations • correlation with electrode/ cell potentials • correlation with cell potential and spontaneity.	
JANUARY 2023	**17**	**20**	**Unit XII: Organic Chemistry -Some Basic Principles and Techniques** General introduction, methods of purification, qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds. 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. **CLASS XI PERIODIC TEST - 2**	• Functional group models (Using play dough and tooth picks) • Create: a polymer map And a Venn diagram to understand monomers and their polymer Correlation with quantitative estimation in lab. • Demonstrations: Chromatography Separating	

				funnel Distillation etc	
FEBRUARY 2023	**23**	**18**	**<u>Unit XIII:Hydrocarbons</u>** Classification of Hydrocarbons Aliphatic 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, halogenation, Friedel Craft's alkylation and acylation, directive influence of functional group in monosubstituted benzene. Carcinogenicity and toxicity. **REVISION FOR SESSION ENDING EXAMS** **PRACTICAL EXAMS FOR CLASS XI**	● practice of nomenclature of various hydrocarbons ● explaining various conformations of ethane and their stabilities with models / diagrams/ppt ● performing bromine water test for unsaturation quiz / worksheet on various reactions and aromaticity of benzene ● explaining directive influence of functional group in monosubstituted ● Benzene with respective resonating diagrams	
MARCH 2023			**SEE CLASS XI**		