NAVODAYA VIDYALAYA SAMITI

CLASS: XI **SUBJECT: Chemistry**

Unit No	Name of The Chapter/ unit	Marks	Periods
1	Some Basic Concepts of Chemistry	7	18
2	Structure of Atom	9	20
3	Classification of Elements and Periodicity in Properties	6	12
4	Chemical Bonding and Molecular Structure	7	20
5	Chemical Thermodynamics	9	23
6	Equilibrium	7	20
7	Redox Reactions	4	9
8	Organic Chemistry: Some basic Principles and Technique	11	20
9	Hydrocarbons	10	18
	Total	70	160
	Practical Assessment	30	--
	Grand Total	100	--

PRACTICALS

Time Allowed: 03 Hours **Max.Marks:30**

Evaluation Scheme	Marks
I. Volumetric Analysis	08 Marks
II. Salt Analysis	08 Marks
III. Content based experiment	06 Marks
IV. Record + Viva	04 Marks
V. Project + Viva	04 Marks
Total	30 Marks

MONTH	NO OF DAYS	NO. OF PERIODS	Weightage of Marks for the Unit/ Chapter	Main Topic and Sub-Topics to be Covered	Activities/Projects/ Practical Experiments to be Held/ Specific Assessment Tool(s) (Suggested)	TESTS Periodic / Term /Pre-Board/ Revision/ Annual Exam
APRIL	26	18 + 07	7 3	**Unit 1: Some Basic Concepts of Chemistry (18 Periods)** 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. **Unit 2: Structure of Atom (20 Periods)** Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars. Thomson's model and its limitations. Bohr's model and its limitations,	• **Basic Laboratory Techniques** a) Cutting glass tube and glass rod. b)Bending a glass tube c) Drawing out a glassjet. d) Boring acork. • Use of Chemical Balance • Preparation of standard solution of Oxalic Acid. • Preparation of standard solution of sodium carbonate.	**UNIT TEST-I 26-29 APRIL 2024**

JULY	24	13 + 06	**06** **03**	concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shape 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 filledorbitals. **Unit 3: Classification of elements and periodicity in properties (12 Periods)** Significance of classification, brief history of the development of periodic table. Modern periodic law and the present form of periodic table,	• **Characterization and Purification of Chemical Substance** • Crystallization of an impure sample of any one of the following: alum, copper Sulphate, benzoic acid. • Determination of melting point of an organic Compound. • Determination of Boiling point ofan organic compound • Determination of strength of a given solution of sodium hydroxide by titrating it against standard solution of oxalic acid	
AUGUST	27	06+ 20	**03** **0 7**	Periodic trends in properties of elements –atomic radii, ionic radii, Ionization enthalpy, electron gain enthalpy, electro negativity, valency, Nomenclature of elementswithatomicnumbergreater than 100. **Unit 4:Chemical bonding and molecular structure (20 Periods)** 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 orbital and shapes of some simple molecules, molecular orbital theory of homo nuclear diatomic molecules (Qualitative idea only), hydrogenbond.	• Determination of strength of a given solution of hydrochloric acid by titrating it against standard solution of sodium carbonate.	**UNIT TEST -II 8-10 AUGUST-2024**

SEPTEMBER	24	23	**09**	**Unit: 5 Thermodynamics (23 Periods)** Concept of System and types of system, surrounding, 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, enthalpies of bond dissociation, combustion, formation, atomization, sublimation, phase transformation, ionization and solution and dilution. Second Law of Thermodynamics. Introduction of entropy as a state function, free energy change for spontaneous and non - spontaneous process criteria forequilibrium. Third law of Thermodynamics (brief introduction)	• Enthalpy of dissolutions of copper sulphate or potassium nitrate. • Enthalpy of neutralization of strong acid (HCl) and strong base (NaOH) a)	**REVISION AND TERM TEST-I** **23 Sep -04 OCTOBER 2024**
OCTOBER	21	10	**04**	**Unit 6 Equilibrium (20 Periods)** 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,	• **Any one of the following experiments: Experiments based on pH (04 Periods)** Determination of pH of some solutions obtained from fruit juices, varied concentrations of acids, bases and salts using pH paper or universal indicator. (ii) Comparing the pH of solutions of strong and weak acid of same concentration (iii) Study the pH change by common-ion in case of weak acids and weak bases.	

NOVEMBER	15	10+ 05	**03** **02**	strong and weak electrolytes, degree of ionization, concept of pH, hydrolysis of salts (elementary idea), buffer solution, solubility product, common ion effect (With illustrative examples). **Unit 7: Redox Reactions (9 Periods)** Concept of oxidation and reduction, Redox reactions, oxidation number,	• **Salt Analysis** (Insoluble salts should be avoided; Sufficient number of single salts should be given for analysis so that at least one cation from each group and important anions are covered) **Cations-** **Pb^{2+}, Cu^{2+}, As^{3+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+** **Anions-** **CO_3^{2-}, S^{2-}, SO_3^{2-},SO_4^{2-} NO_3^-, Cl^-, Br^-, I^-, PO_4^{3-}, $C_2O_4^{2-}$, CH_3COO^-**	
DECEMBER	24	04 + 10	**02** **06**	balancing redox reactions, application of redox reactions **Unit 8: Organic Chemistry - Some Basic Principles and Technique (20 Periods)** General introduction, methods of qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds.	• **Determination of Nitrogen, Sulphur, Chlorine in organic compounds**	**UNIT TEST III 12-14 DECEMBER 2024**
JANUARY	25	10 +06	**0 5** **0 2**	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. **Unit 9: Hydrocarbons (18 Periods)** **Classification of Hydrocarbons Alkanes** - Nomenclature, isomerism, conformation (ethane only),physical properties, chemical reactions including free radical mechanism of halogenation combustion and pyrolysis.	**Few investigatory projects** 1.Study the Methods of Purification of Water. 2.Investigation of foaming capacity of differentwashing soaps and the effect of addition sodium carbonate.	

FEBRUARY	24	12	**08**	**Alkenes** - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions addition of hydrogen, halogen, water, hydrogen halides (Markonikov's addition and peroxide effect), ozonolysis, mechanism of electrophilic addition. **Alkynes** - Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction with hydrogen, Halogens, hydrogen halides and water. **Aromatic Hydrocarbons:** Introduction IUPAC nomenclature, benzene resonance, aromaticity, chemical reactions: nitration sulphonation, halogenation, Friedel Craft's alkylation and acylation, mechanism of electrophilic substitution. Directive influence of a substituent in mono-substituted benzene, carcinogenicity and toxicity.	3. Study the acidity of different samples of tea leaves 4. Determination of the rate of evaporation of different liquids. 5. Study the effect of acids and bases on the tensile strength of fibre. **----------**	**UNIT TEST IV 06-08 FEBRUARY 2025**
				REVISION AND PRACTICAL EXAMINATION		
MARCH	20	-----	-----	**Annual Examinations**	----------	**Annual examinations 17-28 March 2025**