

## COMMON ANNUAL EXAMINATION (2024-2025)

### SYLLABUS

CLASS: XI

SUBJECT: CHEMISTRY

**TEXTBOOKS:**

1. CHEMISTRY PART-I TEXT BOOK FOR CLASS XI
2. CHEMISTRY PART-II TEXT BOOK FOR CLASS XI

S.NO.	UNIT/CHAPTER /TOPIC	SUBTOPICS	WEIGHTAGE
1.	SOME BASIC CONCEPTS OF CHEMISTRY	<p>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.</p> <p><b>* Ways to calculate the concentration of solution( mass percentage , mole fraction, molarity, molality) are excluded.</b></p>	7
2.	STRUCTURE OF ATOM	<p>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 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, Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals</p>	9
3.	CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES	<p>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.</p>	6
4.	CHEMICAL BONDING AND MOLECULAR STRUCTURES	<p>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,</p>	7

		molecular orbital theory of homonuclear diatomic molecules(qualitative idea only), Hydrogen bond.	
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 U and H, 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 entropy, Gibb's energy change, criteria for equilibrium.	9
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, concept of pH, hydrolysis of salts (elementary idea),buffer solution, Henderson Equation, solubility product, common ion effect (with illustrative examples).	7
7.	REDOX REACTIONS	Redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number. <b>*Applications of redox reaction are <u>not</u> included</b>	4
8.	ORGANIC CHEMISTRY:SOME BASIC PRINCIPLES AND TECHNIQUES	General introduction, methods of purification, quantitative analysis <b>*(of carbon, hydrogen and sulphur only)</b> classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyperconjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions. <b>*Qualitative analysis is not included</b>	11
9.	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 (Markovnikov's addition	10

		<p>and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition.</p> <p>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:</p> <p>Introduction, IUPAC nomenclature, benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution.</p> <p>Nitration, sulphonation, halogenation, Friedel Craft alkylation and acylation, directive influence of functional group in monosubstituted benzene.</p>	
			<b>TOTAL MARKS= 70</b>

**FOR CLASS 11:**

**THEORY (Subject Specific as per CBSE): 80 / 70 / 60 / 30 marks**

**INTERNAL ASSESSMENT (Subject Specific as per CBSE) (Practical/Project Work/Viva): 20 / 30 / 40 / 70 marks**