

Unit	Topic / Portion deleted for 2020-2021 academic session
I	Some Basic Concepts of Chemistry Historical approach to particulate nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules.
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
III	Classification of Elements and Periodicity in Properties Significance of classification, brief history of the development of periodic table.
V	States of Matter: Gases Kinetic energy and molecular speeds (elementary idea), liquefaction of gases, critical temperature. Liquid State — Vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).
VI	Thermodynamics Heat capacity and specific heat, criteria for equilibrium.
VII	Equilibrium Hydrolysis of salts (elementary idea), Henderson equation.
VIII	Redox Reactions Applications of redox reactions.
IX	Hydrogen Preparation, properties and uses of hydrogen; hydrogen peroxide-preparation, reactions, use and structure.
X	Block Elements (Alkali and Alkaline earth metals) <i>Group 1 and Group 2 elements:—</i> Preparation and Properties of Some Important Compounds: Sodium carbonate, sodium chloride, sodium hydroxide and sodium hydrogencarbonate, biological importance of sodium and potassium. CaO, CaCO ₃ , and industrial use of lime and limestone, biological importance of Mg and Ca
XI	Some <i>p</i> -Block Elements — Some important compounds: borax, boric acids, boron hydrides. Aluminium: uses, reactions with acids and alkalies. Uses of some important compounds-: oxides. Important compounds of silicon and a few uses: silicon tetrachloride, silicones, silicates and zeolites, their uses.
XII	Organic Chemistry -Some Basic Principles and Techniques Methods of purification, qualitative and quantitative analysis.
XIII	Hydrocarbons Classification of Hydrocarbons. - Aliphatic Hydrocarbons: <i>Alkanes</i> — including free radical mechanism of halogenation, combustion and pyrolysis.

XIV	<p>Environmental Chemistry</p> <p><i>Environmental pollution</i> —Air, water and soil pollution, chemical reactions in atmosphere, smogs, major atmospheric pollutants; acid rain, ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming— pollution due to industrial wastes; green chemistry as an alternative tool for reducing pollution, strategy for control of environmental pollution.</p>
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Weightage to content area of selected portion :

Unit	Topic / Portion Selected for 2020-2021 academic session	Mark
I	<p>Some Basic Concepts of Chemistry</p> <p><i>General Introduction:</i> Importance and scope of chemistry.</p> <p>Atomic and molecular masses. Mole concept and molar mass; percentage composition and empirical and molecular formula; chemical reactions, stoichiometry and calculations based on stoichiometry</p>	05
II	<p>Structure of Atom</p> <p>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 orbitals, quantum numbers, shapes of <i>s</i>, <i>p</i> and <i>d</i> orbitals; rules for filling electrons in orbitals -Aufbau principle, Pauli exclusion principle and Hund's rule, electronic configuration of atoms, stability of half filled and completely filled orbitals.</p>	06
III	<p>Classification of Elements and Periodicity in Properties</p> <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, valence. Nomenclature of elements with atomic number greater than 100.</p>	04
IV	<p>Chemical Bonding and Molecular Structure</p> <p>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 <i>s</i>, <i>p</i> and <i>d</i> orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only). Hydrogen bond.</p>	05
V	<p>States of Matter: Gases</p> <p>Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles's law, Gay Lussac's law, Avogadro's law, ideal gas behaviour, empirical derivation of gas equation, Avogadro's number, ideal gas equation. Deviation from ideal behaviour.</p> <p>Liquid State —Vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).</p>	04

VI	<p>Thermodynamics</p> <p>Concepts of system, types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions.</p> <p>First law of thermodynamics — internal energy and enthalpy, 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.</p> <p>Introduction of entropy as a state function, Second law of thermodynamics, Gibbs energy change for spontaneous and non-spontaneous process.</p> <p>Third law of thermodynamics - Brief introduction.</p>	06
VII	<p>Equilibrium</p> <p>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 polybasic acids, acid strength, concept of pH, buffer solutions, solubility product, common ion effect (with- illustrative examples).</p>	06
VIII	<p>Redox Reactions</p> <p>Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions in terms of loss and gain of electron and change in oxidation numbers.</p>	03
IX	<p>Hydrogen</p> <p>Position of hydrogen in periodic table, occurrence, isotopes; hydrides — ionic, covalent and interstitial; physical and chemical properties of water, heavy water; hydrogen as a fuel.</p>	03
X	<p>Block Elements (Alkali and Alkaline earth metals)</p> <p><i>Group 1 and Group 2 elements:</i></p> <p>General introduction, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens; uses.</p>	05
XI	<p>Some <i>p</i>-Block Elements</p> <p>General Introduction to <i>p</i>-Block Elements</p> <p><i>Group 13 elements:</i> General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group; Boron-physical and chemical properties.</p> <p><i>Group 14 elements:</i> General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first element. Carbon - catenation, allotropic forms, physical and chemical properties.</p>	05

XII	<p>Organic Chemistry -Some Basic Principles and Techniques General introduction, classification and IUPAC nomenclature of organic compounds.</p> <p>Electronic displacements in a covalent bond-. inductive effect, electromeric effect, resonance and hyper conjugation.</p> <p>Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions; electrophiles and nucleophiles, types of organic reactions.</p>	07
XIII	<p>Hydrocarbons Classification of Hydrocarbons. - Aliphatic Hydrocarbons: <i>Alkanes</i> — Nomenclature, isomerism, conformations (ethane only), physical properties, chemical reactions. <i>Alkenes</i> —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 and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition. <i>Alkynes</i> —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 mono substituted benzene; carcinogenicity and toxicity.</p>	11
Total		70

Weightage to form of questions :

Sl No.	Type of questions	No. of questions	Mark for each question	Total
1	Objective type	14	1	14
2	Short Answer I	11	2	22
3	Short Answer II	08	3	24
4	Long Answer	02	5	20
Total		35		70

Sample Blue Print : Chemistry XI

Units	Forms of Question/ Topic	Knowledge			Understanding			Application			HOTS			Total
		Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	
I	Some Basic concept of Chemistry					2(1)			3(1)					5(2)
II	Structure of Atom	2(2)					3(1)			1(1)				6(4)
III	Classification of elements		2(1)			2(1)								4(2)
IV	Chemical Bonding												5(1)	5(1)
V	States of Matter	1(1)				2(1)				1(1)				4(3)
VI	Thermodynamics	1(1)												6(2)
VII	Equilibrium	1(1)				2(1)				1(1)	2(1)			6(4)
VIII	Redox reaction											3(1)		3(1)
IX	Hydrogen						3(1)							3(1)
X	S-Block Elements	2(2)									3(1)			5(3)
XI	Some p-block elements									2(2)				5(3)
XII	Organic Chemistry : Some Principles	2(2)	2(1)	3(1)										7(4)
XIII	Hydrocarbons	2(1)	3(1)			4(2)				2(1)				11(5)
Sub Total		9(9)	6(3)	6(2)		12(6)	9(3)		4(2)	3(3)	9(3)	5(1)	2(2)	70(35)
Total		21(14)			21(9)			21(9)			7(3)			

Note : 1) The figures in the bracket denotes the number of questions

2) This is only a sample Blue Print. The question setter may develop his/her own Blue Print as per the question design