Syllabus : 2023-2024

Class – XI
Sub : Chemistry
(Theory)

Time : 3 hours, Max. marks : 70

Course Structure

Unit No.	Chapters	Title	No. of periods	Marks
Unit I	Chapter-1	Some Basic Concept of Chemistry	12	07
Unit II	Chapter-2	Structure of Atom	14	09
Unit III	Chapter-3	Classification of Elements and Periodicity in properties	08	06
Unit IV	Chapter-4	Chemical Bonding and Molecular Structure	14	07
Unit V	Chapter-6	Chemical Thermodynamics	16	09
Unit VI	Chapter-7	Equilibrium	14	07
Unit VII	Chapter-8	Redox Reactions	06	04
Unit VIII	Chapter-12	Organic Chemistry: Some basic Principles and Techniques	14	11
Unit IX	Chapter-13	Hydrocarbons	12	10
	TOTAL	**Theory**		**70**
		Practical		**30**
		Grand Total		**100**

Class – XI
Chemistry (Theory)

Time : 3 hours, Max. marks : 70

Unit-I : Some Basic Concepts of Chemistry **12 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-II : Structure of Atom **14 Periods**

Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars, Thomson's model and its limitations, Rutherford's model and its limitation, 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's, quantum numbers, shapes of s, p and d orbital's, rules for filling electrons in orbital's - Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbital's.

Unit-III : Classification of Elements and Periodicity in Properties **08 Periods**

Significance of classification, brief history of the development of periodic table, Modern periodic law and the

present form of table, periodic trends improprieties 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.

Unit-IV : Chemical Bonding and Molecular Structure **14 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 orbitals and shapes of some simple molecules, molecular orbital theory of homo nuclear diatomic molecules(qualitative idea only), hydrogen bond.

Unit-V: Chemical Thermodynamics **16 Periods**

Concept 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, 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 thermodynamic(brief introduction)

Unit-VI: Equilibrium **14 Periods**

Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium-LeChatelier'sprinciple.

ionic equilibrium – ionization of acids and bases, string and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength, concept of pH, hydrolysis of salt (elementary idea) buffer solution, Henderson Equation, solubility product, commonion effect (with illustrative examples).

Unit-VII : Redox Reactions **06 Periods**

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, application of redox reaction.

Unit-VIII : Organic Chemistry - Some Basic Principles and Techniques **14 Periods**

General introduction, methods of purification, qualitative and quantitative analysis, 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.

Unit-IX : Hydrocarbons **12 Periods**

Classification of Hydrocarbons

Aliphatic Hydrocarbons:

Alkanes – Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions including free radical mechanism of halogenations, combustion and pyrolysis.

Alkenes – Nomenclature, structure of double bond (ethane), 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 (ethane), 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.

Class – XI
Chemistry (Practical)

Total no. of periods : 60

Sl No.	Evaluation scheme for Examination	Marks
1	Volumetric Analysis	10
2	Salt Analysis	10
3	Lab. Note Book	03
4	Viva	02
5	Attendance	05
	TOTAL	**30**

Quantitative Estimation

i) Using a chemical balance.

ii) Preparation of standard solution of Oxalic acid.

iii) Determination of strength of a given solution of Sodium Hydroxide by titrating it against standard solution of Oxalic acid.

iv) Preparation of standard solution of Sodium Carbonate.

v) Determination of strength of a given solution of Hydrochloric acid by titrating it against standards Sodium Carbonate solution.

Qualitative Analysis

a) Determination of one anion and one cation in a given salt

Cations – Pb^{2+}, Cu^{2+}, 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

(Note : Insoluble sants excluded)

Class – XI
Chemistry

Chapter wise marks distribution

Half-yearly Examination : 2023-24

Unit No.	Chapters	Title	Marks
Unit-I	Chapter-1	Some Basic Concept of Chemistry	13
Unit-II	Chapter-2	Structure of Atom	14
Unit V	Chapter-6	Chemical Thermodynamics	15
Unit-VII	Chapter-8	Redox Reactions	08
Unit-VIII	Chapter-12	Organic Chemistry: Some basic Principles and Techniques	20
		Total(Theory)	**70**
		Total Practical	**30**
		Grand Total	**100**

Annual Examination : 2023-24

Unit No.	Chapters	Title	Marks
Unit-III	Chapter-3	Classification of Elements and Periodicity in properties.	10
Unit-IV	Chapter-4	Chemical bonding and molecular Structure.	20
Unit VI	Chapter-7	Equilibrium	20
Unit-IX	Chapter-13	Hydrocarbons	20
		Total(Theory)	**70**
		Total Practical	**30**
		Grand Total	**100**

Class – XI
Chemistry

Half-yearly Examination : 2023-24

Blue Print of distribution of Marks

Unit	Chapter	MCQ 1 mark	VSA 1 mark	SA(I) 2 marks	SA(II) 3 marks	LA(I) 4 marks	LA(II) 5 marks	Total Marks/ No. of Questions
Chapter-1	Some Basic Concept of Chemistry	1x2	1x2	2x1	3x1	4x1	-	13
Chapter-2	Structure of Atom	1x2	1x3	2x1	3x1	4x1	-	14
Chapter-6	Chemical1x2 Thermodynamics	1x2	1x3	2x1	3x1	-	5x1	15
Chapter-8	Redox Reactions	1x2	1x1	2x1	3x1	-	-	08
Chapter-12	Organic Chemistry : basic Principles and Techniques	1x2	1x1	2x1	3x2	4x1	5x1	20
	Total no. of questions	**10**	**10**	**05**	**06**	**03**	**02**	**36**
	Total Marks							**70**

Annual Examination : 2023-24

Blue Print of distribution of Marks

Unit	Chapter	MCQ 1 mark	VSA 1 mark	SA(I) 2 marks	SA(II) 3 marks	LA(I) 4 marks	LA(II) 5 marks	Total Marks/ No. of Questions
Chapter-3	Classification of Elements and Periodicity in properties.	1x4	1x2	2x2	-	-	-	10
Chapter-4	Chemical bonding and molecular structure	1x2	1x3	2x1	3x3	4x1	-	20
Chapter-7	Equilibrium	1x2	1x4	2x1	3x1	4x1	5x1	20
Chapter-13	Hydrocarbon	1x2	1x1	2x1	3x2	4x1	5x1	20
	Total no. of questions	**10**	**10**	**05**	**06**	**03**	**02**	**36**
	Total Marks							**70**

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