

SUBJECT: CHEMISTRY

SYLLABUS FOR SESSION: 2021 – 2022

CLASS – XII

THEORY – 70 MARKS

SL. NO.	UNIT	MARKS
1.	Solid State	4
2.	Solutions	6
3.	Electrochemistry	5
4.	Chemical Kinetics	10
5.	Surface Chemistry	7
6.	p-Block Elements	8
7.	d- and f-Block Elements	1
8.	Coordination Compounds	4
9.	Haloalkanes and haloarenes	4
10.	Alcohols, Phenols and Ethers	4
11.	Aldehydes, Ketones and Carboxylic Acids	10
12.	Organic Compounds Containing Nitrogen	4
13.	Biomolecules	3

Solid State:

Classification of Solids based on different binding forces; molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea), unit cell in two dimensional and three dimensional lattices, packing efficiency, calculation of density of unit Cell, Packing in solids, voids, number of atoms per unit cell in a cubic unit cell, point defects.

Solutions:

Types of Solutions, expression of concentration of solution of solids in liquids, solubility of gases in liquids in liquids, solid solutions, Raoult's law, colligative properties – relative lowering of vapour pressure, elevation of boiling point, depressing of freezing point, osmotic pressure, determination of molecular masses using colligative properties.

Electrochemistry:

Redox reactions, EMF of cell, standard and electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a Cell, Conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's law, electrolysis and laws of electrolysis (elementary idea).

Chemical Kinetics:

Rate of reaction (average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst, order and molecularity of a reaction; rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reaction)

Surface Chemistry:

Adsorption – Physisorption and chemisorptions, factors affecting adsorption of gases on solids, colloidal state, distinction between true solutions, multi molecular and macromolecular colloids; properties of colloids, Tyndall effect, Brownian movement, electrophoresis, coagulation.

P- Block Elements:

Group 15 elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; Nitrogen – Preparation, properties and uses; compounds of nitrogen' Preparation and properties of ammonia and nitric acid.

Group 16 elements: General introduction, electronic configuration, Oxidation states, Occurrence, trends in physical and chemical properties, dioxygen, preparation, properties and uses; classification

of oxides, Ozone, sulphur – allotropic forms : compounds of sulphur : preparation , properties and uses of sulphur dioxide , sulphuric acid : properties and uses : oxoacids of sulphur (structures only).

Group 17 elements: General introduction, electronic configuration, oxidation states , occurrence, trends in physical and chemical properties : compounds of halogens : Preparation , properties and uses of chlorine and hydrochloric acid, interhalogen compounds, oxoacids of halogens (structure only).

Group 18 elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses

d- and f-Block Elements:

General introduction, electronic configuration, occurrence and characteristic of transition metals , general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii colour, catalytic property, magnetic properties, interstitial compounds, alloy formation. Lanthanoids – electronic configuration, oxidation states and lanthanoid contraction and its consequences.

Coordination Compounds:

Coordination compounds – introduction , ligands, coordination number, colour, magnetic properties and shape, IUPAC nomenclature of mononuclear coordination compounds, bonding, Werner's theory, VBT and CFT.

Haloalkanes and Haloarenes:

Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions, stability of carbonations R-S and d-l configurations.

Haloarenes: Nature of C-X bond , substitution reactions (directive influence of halogen for monosubstituted compounds only)

Alcohols, Phenols and Ethers:

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols; mechanism of dehydration

Phenols: Nomenclature, methods of Preparation, physical and chemical properties , acidic nature of phenol, electrophilic substitution reactions, uses of phenol.

Ethers: Nomenclature, methods of preparation, Physical and chemical properties uses.

Aldehydes, Ketones and Carboxylic Acids:

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes uses.

Carboxylic Acids: Nomenclature, acidic nature methods of preparation, physical and chemical properties uses.

Organic Compounds Containing Nitrogen :

Nitro compounds: General methods of preparation and chemical reactions.

Amines: Nomenclature, classification, structure methods of preparation, physical and chemical properties, uses, identification of primary secondary and tertiary amines.

Cyanides and isocyanides – will be mentioned at relevant places in context.

Bio Molecules:

Carbohydrates – Classification (Alloses and ketose), monosaccharide's (glucose and fructose) D-L configuration

Proteins – Elementary idea of alpha amino acids, peptide bond, polypeptides, proteins, structure of proteins –Primary secondary, tertiary and quaternary structures (qualitative idea only), denaturation of proteins.

Nucleic Acids: DNA and RNA

Question Pattern for H.S. Examination – 2022

Subject: CHEMISTRY

Topic	MCQ (1 mark)	Very Short Answer Questions (1 mark)	Short Answer Questions (1 mark)	Short Answer Questions (2 Marks)	3 Mark Question	Total
Solid State	1x1=1			1x3=3		04
Solutions	1x1=1		1x2=2	1x3=3		06
Electro Chemistry	1x1=1	1x1=1		1x3=3		05
Chemical Kinetics	1x1=1	1x1=1		1x3=3	1x5=5	10
Surface Chemistry	1x1=1	1x1=1	1x2=2	1x3=3		07
P- Block Elements	1x1=1		1x2=2		1x5=5	08
d- and f-Block Elements	1x1=1					01
Co-ordination Compounds	1x1=1	1x1=1	1x2=2			04
Haloalkanes and Haloarenes	1x1=1			1x3=3		04
Alcohols, Phenol and Ethers	1x1=1			1x3=3		04
Aldehydes, Ketones and Carboxylic Acids	2x1=2			1x3=3	1x5=5	10
Organic Compounds Containing Nitrogen	1x1=1			1x3=3		04
Biomolecules	1x1=1		1x2=2			03
Total	14	04	10	27	15	70