

Syllabus

CHEMISTRY

CLASS XII (Code No. 043)

Syllabus for Session 2021-22 Term II

THEORY

Time: 90 Minutes

Max Marks: 35

S.No	UNIT	Periods	MARKS
1	Electrochemistry	7	13
2	Chemical Kinetics	5	
3	Surface Chemistry	5	
4	The <i>d</i> - and <i>f</i> -Block Elements	7	9
5	Coordination Compounds	8	
6	Aldehydes, Ketones and Carboxylic Acids	10	13
7	Amines	7	
	TOTAL	49	35

Chapter-1: Electrochemistry

7 Periods

Redox reactions, EMF of a cell, standard 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.

Chapter-2: Chemical Kinetics

5 Periods

Rate of a 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 reactions).

Chapter-3: Surface Chemistry

5 Periods

Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, colloidal state: distinction between true solutions, colloids and suspension; lyophilic, lyophobic, multi-molecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation.

Chapter-4: The *d*- and *f*-Block Elements

7 Periods

General introduction, electronic configuration, occurrence and characteristics 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.

Chapter-5: Coordination Compounds

8 Periods

Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT.

Chapter-6: Aldehydes, Ketones and Carboxylic Acids

10 Periods

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.

Chapter-7: Amines

7 Periods

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

PRACTICALS

Term II: At the end of Term II, a **15-mark Practical** would be conducted under the supervision of Board appointed external examiners. This would contribute to the overall practical marks for the subject.

Evaluation Scheme

S. No	Practical	Marks
1.	Volumetric Analysis	4
2.	Salt Analysis	4
3.	Content Based experiment	2
4.	Project Work and Viva (Internal and External Both)	5
	TOTAL	15

1. Volumetric analysis (4 marks)

Determination of concentration/ molarity of KMnO_4 solution by titrating it against a standard solution of:

- (i) Oxalic acid,
- (ii) Ferrous Ammonium Sulphate

(Students will be required to prepare standard solutions by weighing themselves).

2. Salt analysis (Qualitative analysis) (4 marks)

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

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 - $(\text{CO}_3)^{2-}$, S^{2-} , NO_2^- , SO_3^{2-} , SO_4^{2-} , NO_3^- , Cl^- , Br^- , I^- , PO_4^{3-} , $\text{C}_2\text{O}_4^{2-}$, CH_3COO^-

(Note: Insoluble salts excluded)

3. Content Based Experiments (2 marks)

A. Preparation of Inorganic Compounds

Preparation of double salt of Ferrous Ammonium Sulphate or Potash Alum.

Preparation of Potassium Ferric Oxalate.

B. Tests for the functional groups present in organic compounds:

Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary)