

CHEMISTRY

Theory Part-I	60 Marks	Time:2:00 Hours
Theory Part-II	60 Marks	Time:2:00 Hours
Practical	30 Marks	
Total	150 Marks	

PART - I (Class -IX) 60 Marks Time: 2:00 Hours

Unit I FUNDAMENTALS OF CHEMISTRY

- 1.1) Branches of Chemistry
 - 1.1.1 Physical Chemistry
 - 1.1.2 Organic Chemistry
 - 1.1.3 Inorganic Chemistry
 - 1.1.4 Biochemistry
 - 1.1.5 Industrial Chemistry
 - 1.1.6 Nuclear Chemistry
 - 1.1.7 Environmental Chemistry
 - 1.1.8 Analytical Chemistry
- 1.2) Basic Definitions
 - 1.2.1 Elements, Compounds and Mixture
 - 1.2.2 Atomic Number and Mass Number
 - 1.2.3 Relative Atomic Mass and Atomic Mass Unit
 - 1.2.4 How to write a Chemical Formula (Empirical and Molecular Formula)
 - 1.2.5 Molecular Mass and Formula Mass
- 1.3) Chemical Species
 - 1.3.1 Ions (Cations and Anions), Molecular Ions and Free Radicals
 - 1.3.2 Types of Molecules
- 1.4) Gram Atomic Mass, Gram Molecular Mass and Gram Formula Mass
 - 1.4.1 Gram Atomic Mass
 - 1.4.2 Gram Molecular Mass

- 1.4.3 Gram Formula Mass
- 1.5) Avogadro's Number and Mole
 - 1.5.1 Avogadro's Number
 - 1.5.2 Mole (Chemist's Secret Unit)

- 1.6) Chemical Calculations
 - 1.6.1 Mole-Mass Calculations
 - 1.6.2 Mole-Particle Calculations

Unit 2 **STRUCTURE OF ATOMS**

- 2.1) Theories and Experiments Related Structure of Atom
 - 2.1.1 Rutherford's Atomic Model
 - 2.1.2 Bohr's Atomic Theory
- 2.2) Electronic Configuration
(Electronic Configuration of First 18 Elements)
- 2.3) Isotopes
 - 2.3.1 Definition
 - 2.3.2 Examples
 - 2.3.3 Uses

Unit 3 **PERIODIC TABLE AND PERIODICITY OF PROPERTIES**

- 3.1) Periodic Table
 - 3.1.1 Periods
 - 3.1.2 Groups
- 3.2) Periodicity of Properties
 - 3.2.1 Atomic Size and Atomic Radius
 - 3.2.2 Shielding Effect
 - 3.2.3 Ionization Energy
 - 3.2.4 Electron Affinity
 - 3.2.5 Electronegativity

Unit 4 **STRUCTURE OF MOLECULES**

- 4.1) Why do Atoms form Chemical Bonds?
- 4.2) Chemical Bonds
- 4.3) Types of Chemical Bonds
 - 4.3.1 Ionic Bond
 - 4.3.2 Covalent Bond

- 4.3.3 Dative Covalent or Coordinate Covalent Bond
- 4.3.4 Polar and Non-Polar Covalent Bond
- 4.3.5 Metallic Bond
- 4.4) Intermolecular Forces
 - 4.4.1 Dipole-Dipole Interaction
 - 4.4.2 Hydrogen Bonding
- 4.5) Nature of Bonding and Properties
 - 4.5.1 Ionic Compounds
 - 4.5.2 Covalent Compounds
 - 4.5.3 Coordinate Covalent Compounds
 - 4.5.4 Metals

Unit 5 PHYSICAL STATES OF MATTER

5.1) Typical Properties of Gaseous State

- 5.1.1 Diffusion
- 5.1.2 Effusion
- 5.1.3 Pressure
- 5.1.4 Compressibility
- 5.1.5 Mobility
- 5.1.6 Density of Gases

5.2) Laws Related to Gases

- 5.2.1 Boyle's Law
- 5.2.2 Charles's Law

5.3) Typical Properties of Liquid State

- 5.3.1 Evaporation
- 5.3.2 Vapour Pressure
- 5.3.3 Boiling Point
- 5.3.4 Freezing Point
- 5.3.5 Diffusion
- 5.3.6 Density

5.4) Typical Properties of Solid State

- 5.4.1 Melting Point
- 5.4.2 Rigidity
- 5.4.3 Density

5.5) Types of Solids

5.5.1 Amorphous Solids

5.5.2 Crystalline Solids

5.6) Allotropy

Unit 6 **SOLUTIONS**

6.1) Solution

6.1.1 Aqueous Solution

6.1.2 Solute

6.1.3 Solvent

6.2) Saturated Solution

6.2.1 Unsaturated Solution

6.2.2 Supersaturated Solution

6.2.3 Dilution of Solution

6.3) Types of Solution

6.4) Concentration Units

6.4.1 Percentage

6.4.2 Molarity

6.4.3 Problems Involving the Molarity of a Solution

6.5) Solubility

6.5.1 Solubility and Solute-Solvent Interaction

6.5.2 Effect of Temperature on Solubility

6.6) Comparison of Solution, Suspension and Colloid

6.6.1 Solution

6.6.2 Colloid

6.6.3 Suspension

Unit 7 **ELECTROCHEMISTRY** ✓

7.1) Oxidation and Reduction Reactions

7.2) Oxidation state and Rules for assigning
Oxidation state

7.3) Oxidizing and Reducing Agents

7.4) Oxidation Reduction Reactions

7.5) Electrochemical Cells

7.5.1 Concept of Electrolytes (Strong Electrolytes,
Weak Electrolytes, Non-Electrolytes)

- 7.5.2 Electrolytic Cells (Construction of an Electrolytic Cell, Working of an Electrolytic Cell, Electrolysis of Water)
- 7.5.3 Galvanic Cell
(Construction of a Daniel Cell, Working of the Cell)
- 7.6) Electrochemical Industries
 - 7.6.1 Manufacture of Sodium Metal from Fused NaCl
(Working of Downs Cell)
 - 7.6.2 Manufacture of NaOH from Brine
- 7.7) Corrosion and its Prevention
 - 7.7.1 Rusting of Iron
 - 7.7.2 Prevention of Corrosion
(Removal of Stains, Paints and Greasing, Alloying, Metallic Coating)

Unit 8 CHEMICAL REACTIVITY ✓

- 8.1) Metals
 - 8.1.1 Electropositive Character
 - 8.1.2 Comparison of Reactivity of Alkali and Alkaline Earth Metals
- 8.2) Non-Metals
 - 8.2.1 Comparison of Reactivity of the Halogens
 - 8.2.2 Important Reactions of Halogens
 - 8.2.3 Significance of Non-Metals