

CHEMISTRY

Distribution of Marks:

Part-I (Class-XI)

Theory Marks: 85

Part-II (Class-XII)

Theory Marks: 85

Practical: 30

Total : 200

Marks: 85	PART –I (CLASS-XI)	Time: 3:00 Hours
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CHAPTER:1 Periodic Table and Periodic Properties

- 1.1 Historical Background
- 1.2 Modern Periodic Table-Main Features
- 1.3 Metals, Non-Metals and Metalloids
- 1.4 Blocks In Periodic Table
- 1.5 Families In Periodic Table
- 1.6 Periodic Arrangement And Electronic Configuration
- 1.7 Periodicity Of Properties
- 1.8 Reactions of Sodium And Magnesium
- 1.9 Trends in Bonding In Oxides and Chlorides Of Period 3
- 1.10 Variation In oxidation Number In Oxides And Chlorides

CHAPTER:2 Atomic Structure

- 2.1 Atomic Number, Proton Number And Nucleon Number; Identity Of an Element
- 2.2 Effect Of Electric Field On Fundamental Particles
- 2.3 Experimental Evidences For The Electronic Configuration
- 2.4 Quantum Numbers
- 2.5 Shapes Of Atomic Orbitals
- 2.6 Electronic Configuration
- 2.7 Electronic Configuration And The Periodic Table
- 2.8 Electronic Configuration Of IONS and Free Radicals
- 2.9 Electronic Configuration And The Formation Of Semiconductors

CHAPTER:3 Chemical Bonding

- 3.1 Types Of Bonding
- 3.2 Electronegativity And the Type of Bond
- 3.3 Intermolecular Forces
- 3.4 Bond Energy And Bond Length
- 3.5 A Comparison Among IONIC, Covalent, Metallic Bonds and Intermolecular Forces
- 3.6 Valence Bond Theory (VBT)
- 3.7 Atomic Orbital Hybridization
- 3.8 Valence Shell Electron Pair Repulsion Model (VSEPR)
- 3.9 Molecular Orbital Theory(MOT)

CHAPTER:4 Stoichiometry

- 4.1 Concept Of Mole
- 4.2 Relationship Between Mole, Molar Mass And Avogadro's Number
- 4.3 Molar Volume
- 4.4 Molar Mass And Density Of gases
- 4.5 Molar Concentration
- 4.6 Stoichiometric Relationships
- 4.7 Limiting And Excess Reactant
- 4.8 Theoretical Yield And Actual Yield
- 4.9 Importance Of Stoichiometry in Production And Dosage Of Medicine

CHAPTER:5 States and Phases of Matter

- 5.1 Properties Of Gases
- 5.2 Ideal Gas Equation
- 5.3 Properties of Liquids
- 5.4 Intermolecular Forces
- 5.5 Surface Tension Of Liquids

5.6	Viscosity Of Liquids
5.7	Evaporation
5.8	Vapour Pressure
5.9	Boiling Point
5.10	Energetics Of Phase Changes
5.11	Solids
5.12	Types of Solids
5.13	Liquid Crystals
CHAPTER:6	Chemical Energetics
6.1	Enthalpy Change
6.2	Energy Profile Diagram
6.3	Standard Enthalpy Changes
6.4	Bond Energy (Bond Dissociation Energy) And Enthalpy Changes
6.5	Enthalpy Change Of Reaction (ΔH_r) And Chemical Bonds
6.6	Measurement Of Enthalpy Change Of a Reaction
6.7	Enthalpy Change And Calorie Content Of Food
6.8	HESS' LAW Of Heat Summation
6.9	Energetics Of Solution
6.10	Born-Haber Cycle
6.11	Entropy
6.12	The Free Energy Change, ΔG
CHAPTER:7	Reaction Kinetics
7.1	Collision Theory
7.2	Rate Of Reaction
7.3	Factors Affecting Rate Of a Chemical Reaction
7.4	Rate Law, Rate Constant And Order Of Reaction
7.5	Determination Of Rate Constant
7.6	Reaction Mechanism
CHAPTER:8	Chemical Equilibrium
8.1	Macroscopic Events And Microscopic Events
8.2	Reversible Reactions, Microscopic Events And Dynamic Equilibrium
8.3	Relation Between Macroscopic and Microscopic Events
8.4	Dynamic Equilibrium Between Two Physical States
8.5	Conditions For Equilibrium
8.6	Characteristics Of Chemical Equilibrium
8.7	Types of Equilibrium
8.8	Equilibrium Constant And Position of equilibrium
8.9	Relationships Between Various Equilibrium Constants
8.10	Position Of Equilibrium And Reaction Conditions
8.11	LE-CHATELIER'S Principle
8.12	The Effect Of Change Of Concentrations
8.13	The Effect Of Change In Pressure Or Volume
8.14	The Effect Of Change In Temperature
8.15	Effect Of Catalyst On Equilibrium
8.16	Industrial Applications Of Chemical Equilibrium
CHAPTER:9	Acid-Base Chemistry
9.1	Bronsted-Lowry Concept
9.2	Lewis Concept Of Acids And Bases
9.3	IONIC Product Of Water
9.4	pH And pOH
9.5	Ionization Constants Of Acids(K_a)
9.6	Common Ion Effect
9.7	Buffer Solutions
9.8	Solubility Product
9.9	Salt Hydrolysis
9.10	Acid-Base Indicators
CHAPTER:10	ELECTROCHEMISTRY
10.1	Oxidation, Reduction, And Redox Reactions

- 10.2 Oxidation Number And Its Significance
- 10.3 Disproportionation Reaction
- 10.4 Oxidizing Agent (Oxidant) And Reducing Agent (Reductant)
- 10.5 Balancing Of redox Equations By Oxidation Number Method
- 10.6 Electrolytic Cell
- 10.7 Redox Reactions In Electrolysis
- 10.8 Mass Of a Substance Deposited During Electrolysis
- 10.9 Amount of Substance Produced During Electrolysis
- 10.10 Avogadro's Constant by The Electrolytic Method
- 10.11 Electrode Potentials
- 10.12 Standard Hydrogen Electrode (SHE)
- 10.13 Standard Electrode Potential(E°)
- 10.14 Measuring Standard Electrode Potentials
- 10.15 Electrochemical Cell (Galvanic Cell)
- 10.16 Applications Of (E°) Values
- 10.17 Variation Of (E°) With ION Concentration
- 10.18 Nernst Equation
- 10.19 Activity Series Of Metals
- 10.20 Feasibility Of Redox Reaction From Activity Series Or Reaction Data
- 10.21 Photovoltaic Cells
- 10.22 Winkler Method, BOD and DO
- CHAPTER:11 Hydrocarbons**
- 11.1 Aliphatic And Aromatic Hydrocarbons
- 11.2 Nomenclature
- 11.3 Reaction Mechanism And Modes Of Bond Breaking
- 11.4 Unreactive Nature Of Alkanes Towards Polar Reagents
- 11.5 Reactions Of Alkanes
- 11.6 Alkenes
- 11.7 Structure And Reactivity Of Alkenes
- 11.8 Reactions OF Alkenes
- 11.9 Conjugated Dienes
- 11.10 Isomerism
- 11.11 Organic Redox Reactions
- CHAPTER:12 Nitrogen and Sulfur**
- 12.1 Reactivity Of Nitrogen(N_2)
- 12.2 Ammonia(NH_3)
- 12.3 Oxides Of Nitrogen
- 12.4 Sources Of Oxides Of Nitrogen
- 12.5 Role Of NO & NO_2 In Smog & Pan Formation
- 12.6 Catalytic Converter
- 12.7 Intrification and Denitrification
- 12.8 Sulfur
- 12.9 Stability of Oxidation States Of Sulfur
- 12.10 Reactions Of Sulfur
- 12.11 Uses Of Sulfur And Its Compounds
- 12.12 Role Of Sulfur In Organic Synthesis
- 12.13 Sulfuric Acid(H_2SO_4)
- CHAPTER:13 Halogens**
- 13.1 Volatility of Chlorine, Bromine And Iodine
- 13.2 Trend In Volatility Of The Halogens
- 13.3 The Bond Strength Of Halogen Molecules
- 13.4 Relative Reactivities Of The Halogens as Oxidizing Agents
- 13.5 Reactions Of the halogens With Hydrogen
- 13.6 Relative Thermal Stabilities Of Hydrogen Halides In Terms Of their Bond strength
- 13.7 Relative Reactivity Of Halide IONS as Reducing Agents
- 13.8 Reactions Of Halides With Aqueous Silver Ion Followed By Aqueous Ammonia

- 13.9 Reactions Of Halides (X^-) With Concentrated Sulfuric Acid
- 13.10 Reactions Of Chlorine With Cold and Hot Aqueous Sodium Hydroxide
- 13.11 Use of Chlorine In Water Purification
- CAPTER:14 Atmosphere**
- 14.1 Layers Of The Atmospheres
- 14.2 Air Pollutants
- 14.3 Sources Of Air Pollution
- 14.4 Sources Of Air Pollutants
- 14.5 Impact of Human Activities On Atmosphere
- 14.6 Effects Of Air Pollutants
- 14.7 Greenhouse Effect and Global Warming
- 14.8 Air Quality
- 14.9 Air Quality and Human Health
- 14.10 Air Pollution And Health Risk
- 14.11 Methods & Techniques To Measure & Monitor Air Quality
- 14.12 Experiments and Data Collection To Test Hypothesis About Air Quality
- 14.13 Analyze Data And Interpret Air Quality
- 14.14 Strategies Used To Reduce Air Pollution
- 14.15 Laws and Regulations Related To Atmosphere
- 14.16 Economics, Social & Political Issues
- CHAPTER:15 Basic Separation Techniques**
- 15.1 Methods of Separation Of Mixures
- 15.2 Crystallization
- 15.3 Separation Through Distillation
- 15.4 Chromatography
- 15.5 How to Check The Purity Of The Product?
- CHAPTER:16 Lab Safety and Practical Skills**
- 16.1 General Instructions To the Students
- 16.2 Common Types Of Hazards In a Laboratory
- 16.3 Waste Disposal System For Chemicals
- 16.4 First aid In Laboratory
- 16.5 Acid-Base titration
- 16.6 Tests for Indentification Of anions
- 16.7 Test For Indentification of Basic Radicals

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