

CHEMISTRY

Part – I	60 Marks
Part – II	60 Marks
Practical	30 Marks
Total	150 Marks

Part-I (Class-IX)	Marks: 60	Time: 2:00 Hours
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- Chapter-1 : STATES OF MATTER AND PHASE CHANGES
- 1.1 What is Chemistry?
 - 1.2 States of Matter
 - 1.3 Element, Compound and Mixture
 - 1.4 Allotropic Forms of Substances
 - 1.5 Differences Between Elements, Compounds and Mixtures
 - 1.6 Solution, Colloidal Solution and Suspension
 - 1.7 Formation of Unsaturated and Saturated Solutions
 - 1.8 Effect of Temperature on the Solubility of Solutes
- Chapter-2 : ATOMIC STRUCTURE
- 2.1 Structure of Atom
 - 2.2 Atomic Number and Mass Numbers
 - 2.3 Isotopes and their Masses
 - 2.4 Relative Atomic Mass
- Chapter-3 : CHEMICAL BONDING
- 3.1 Why do Atoms form Chemical Bonds?
 - 3.2 Chemical Bond
 - 3.3 Metallic Bond
 - 3.4 Electropositive Character of Metals
 - 3.5 Electronegative Character of Non-Metals
 - 3.6 Compare the Properties of Ionic and Covalent Compounds
 - 3.7 Intermolecular Forces of Attraction
 - 3.8 Nature of Bonding and Properties
- Chapter-4 : STOICHIOMETRY
- 4.1 Chemical Formula
 - 4.2 Empirical Formula
 - 4.3 Chemical Formulas of Binary Ionic Compounds
 - 4.4 Chemical Formulas of Compounds
 - 4.5 Deduce the Molecular Formula from the Structural Formula
 - 4.6 Avogadro's Number (N_A)
 - 4.7 The Mole and Molar Mass
 - 4.8 Chemical Equations and Chemical Reactions
 - 4.9 Calculations Based on Chemical Equation
- Chapter-5 : ENERGETICS
- 5.1 System and Surrounding
 - 5.2 Enthalpy
 - 5.3 Exothermic and Endothermic Reactions
 - 5.4 How does a Reaction Take Place?
 - 5.5 Aerobic and Anaerobic Respiration
- Chapter-6 : EQUILIBRIA
- 6.1 Reversible and Irreversible Changes
 - 6.2 Dynamic Equilibrium
 - 6.3 Changing the Physical Conditions of a Chemical Reaction
- Chapter-7 : ACID BASE CHEMISTRY
- 7.1 Acid and Bases
 - 7.2 Different Concepts of Acids and Bases

	7.3	Bronsted – Lowry concepts of Acids and Bases
	7.4	Properties of Acids and Bases
	7.5	Acid Rain and its Effects
Chapter-8 :		PERIODIC TABLE AND PERIODICITY
	8.1	Modern Periodic Table
	8.2	Salient Features of Modern Periodic Table
	8.3	Similarities in the Chemical Properties of Elements in the Same Group
	8.4	Variation of Periodic Properties in Periods and Groups
	8.5	Metallic Character and Reactivity
Chapter-9 :		GROUP PROPERTIES AND ELEMENTS
	9.1	Properties of Group 1 Elements
	9.2	Properties of Group 17 Elements
	9.3	Group Properties of Transition Elements
	9.4	Properties of Noble Gases
	9.5	Physical Properties of Metals and Non-Metals
Chapter-10 :		ENVIRONMENTAL CHEMISTRY
		Introduction
	10.1	Composition of Atmosphere
	10.2	Air Pollutants
	10.3	Acid Rain
	10.4	Global Warming (Greenhouse Effect)
	10.5	Strategies to Reduce Environmental Issues
Chapter-11 :		HYDROCARBONS
		Introduction
	11.1	Hydrocarbons
	11.2	Alkanes
	11.3	Preparation of Alkanes
	11.4	Important Reactions
Chapter-12 :		EMPIRICAL DATA COLLECTION AND ANALYSIS
		Introduction
	12.1	SI Units of Chemistry
	12.2	Tools and Techniques to Manage Accuracy and Precision
	12.3	Accuracy and Precision
Chapter-13 :		LABORATORY AND PRACTICAL SKILLS
		Introduction
	13.1	Chemical Hazards in the Laboratory
	13.2	Hazard Signs
	13.3	Personal Protective Equipment (PPE) in the Laboratory
	13.4	Location of Fire Extinguisher
	13.5	Emergency Situation in the Lab
Prescribed Book:	Chemistry for Part – I (Class –IX)	
Author:	Prof. Dr. Abid Zia (Phd Organic Chemistry)	
	University of East Anglia Norwich, United Kingdom	
Prepared by:	Ahsan Publishers, Lahore	
Published by:	Mehtab & Company	
Printer by:	Naved Hafeez Press	
	For: Punjab Curriculum and TextBook Board, Lahore	

Part-II (Class-X)	Marks: 60	Time: 2:00 Hours
Unit-9 :	CHEMICAL EQUILIBRIUM	
9.1	Reversible Reaction and Dynamic Equilibrium	
9.2	Law of Mass Action	
9.3	Equilibrium Constant and its Units	
9.4	Importance of Equilibrium Constant	
Unit-10 :	ACIDS, BASES AND SALTS	
10.1	Concepts of Acids and Bases	
	10.1.1 Arrhenius Concept of Acids and Bases	
	10.1.2 Limitation of Arrhenius Concept	
	10.1.3 Lewis Concept of Acids and Bases	
	10.1.4 General Properties of Acids	
	10.1.5 General Properties of Bases	
10.2	pH Scale	
10.3	Salts	
	10.3.1 Preparation	
	10.3.2 Types of Salts	
	10.3.3 Uses of Salts	
Unit-11 :	ORGANIC CHEMISTRY	
11.1	Organic Compounds	
	11.1.1 Classification of Organic Compounds	
	11.1.2 Diversity and Magnitude of Organic Compounds	
	11.1.3 General Characteristics of Organic Compounds	
11.2	Sources of Organic Compounds	
	11.2.1 Coal	
	11.2.2 Petroleum	
	11.2.3 Natural Gas	
	11.2.4 Plants	
	11.2.5 Synthesis in Laboratory	
11.3	Uses of Organic Compounds	
11.4	Alkenes and Alky Radicals	
11.5	Functional Groups	
	11.5.1 Functional Groups depend on Carbon, Hydrogen and Oxygen	
	11.5.2 Functional Groups depend on Carbon, Hydrogen and Nitrogen	
	11.5.3 Functional Groups depends on Carbon, Hydrogen and Halogen	
	11.5.4 Double and Triple Bond	
11.6	Tests of functional groups	
	11.6.1 Test for unsaturation	
	11.6.2 Test for Alcoholic group	
	11.6.3 Test for Carboxylic group	
	11.6.4 Test for Aldehydic group	
	11.6.5 Test for Ketonic group	
	11.6.6 Test for Primary Amino group	
	11.6.7 Test for ester	
Unit-12 :	HYDROCARBONS	
12.1	Alkanes	
	12.1.1 Preparation of Alkenes	
	(Hydrogenation of alkenes and alkynes, Reduction of alkyl halides)	
	12.1.2 Chemical reactions (Halogenation, Combustion)	
12.2	Alkenes	
	12.2.1 Preparation of Alkenes	
	(Dehydration of Alcohols, Dehydrohalogenation of alkyl halides)	
	12.2.2 Chemical reactions	
	(Hydrogenation of alkenes, Halogenation of alkenes, Hydro	
	Halogenation of Alkenes, Oxidation of alkenes with KMnO_4)	
12.3	Alkynes	
	12.3.1 Preparation of Alkynes (Dehydro Halogenation of vicinal dihalides,	
	Dehalogenation of terahalides)	
	12.3.2 Chemical Reactions (Addition of halogen, Oxidation with KMnO_4)	

Unit-13 : BIOCHEMISTRY**13.1 Carbohydrates**

13.1.1 Monosaccharides

13.1.2 Oligosaccharides

13.1.3 Polysaccharides

13.1.4 Sources and uses of carbohydrates

13.2 Protein

13.2.1 Amino Acids are building blocks of proteins

13.2.2 Sources and uses of proteins

13.3 Lipids

13.3.1 Fatty acids

13.3.2 Sources and uses of lipids

13.4 Nucleic Acids

13.4.1 Deoxyribonucleic acid (DNA)

13.4.2 Ribonucleic acid RNA

13.5 Vitamins

13.5.1 Types of Vitamins (Fat soluble vitamins, Water soluble vitamins)

13.5.2 Importance of vitamins

Unit-14 : THE ATMOSPHERE**14.1 Composition of Atmosphere****14.2 Layers of Atmosphere**

14.2.1 Troposphere

14.2.2 Stratosphere

14.3 Pollutants

14.3.1 Types of pollutants

14.3.2 Sources of air pollutants

14.4 Acid Rain and its Effects**14.5 Ozone Depletion and its Effects****Unit-15 : WATER****15.1 Properties of Water****15.2 Water as Solvent****15.3 Soft and Hard Water**

15.3.1 Types of Hardness of Water

15.3.2 Methods of Removing Hardness

15.4 Water Pollution

15.4.1 Industrial effluents

15.4.2 Domestic effluents

15.4.3 Agricultural effluents

15.5 Waterborne infectious diseases (Dysentery, Cholera, Cryptosporidium, Fluorosis, Hepatitis, Hookworm, Jaundice, Typhoid)**Unit-16 : CHEMICAL INDUSTRIES****16.1 Basic Metallurgical Operations****16.2 Manufacture of Sodium Carbonate by Solvay's Process**

16.2.1 Materials

16.2.2 Basic reactions

16.3 Manufacture of Urea

16.3.1 Raw materials

16.3.2 Process

16.4 Petroleum Industry

16.4.1 Petroleum

16.4.2 Origin of Petroleum

16.4.3 Important fractions of Petroleum

LIST OF PRACTICALS FOR CLASS-IX (PART-I)

1. Separate the given mixture of iron fillings and sand by physical method.
2. Determine the melting point of given compounds Naphthalene.
3. Determine the melting point of given compounds Biphenyl.
4. Determine the boiling point of given liquids (Acetone).
5. Determine the boiling point of given liquids (Toluene).
6. Determine the boiling point of given liquids (Ethyl alcohol).
7. Demonstrate sublimation using ammonium chloride.
8. Separate naphthalene from given mixture of sand and naphthalene by sublimation.
9. Separate the given mixture of alcohol and water by distillation.

10. Demonstrate that a chemical reaction releases energy in the form of heat.
11. Prepare 100cm³ of 0.1M sodium hydroxide (NaOH solution).
12. Prepare 100cm³ of 0.1M sodium carbonate (Na₂CO₃ solution).
13. Prepare 250cm³ of 0.1M HCl solution.
14. Prepare 250cm³ of 0.1M oxalic acid (H₂C₂O₄.2H₂O solution).
15. Prepare 100cm³ of 0.1M sodium hydroxide (NaOH solution from the given 1M solution).
16. Prepare 100cm³ of 0.01M Na₂CO₃ solution from the given 0.1 M solution.
17. Prepare 100cm³ of 0.01M hydrochloric acid (HCl solution from the given 0.1M solution).
18. Prepare 100cm³ of 0.01M oxalic acid solution from the given 0.1M solution.
19. Prepare pure copper sulphate crystals from the given impure sample.
20. Demonstrate that miscible liquids dissolve in each other and immiscible liquids do not.
21. Demonstrate that temperature affects the solubility.
22. Demonstrate the conductivity of different given solution.
23. Demonstrate a metal displacement reaction in aqueous medium.
24. Demonstrate that two elements combine to form a binary compound.
25. Demonstrate that compounds can be products of a decomposition reaction.
26. Demonstrate that some processes absorb energy.

LIST OF PRACTICALS FOR CLASS-X (PART-II)

1. Identify sodium, calcium, strontium, barium, copper and potassium ions by flame test.
2. Standardize the given NaOH solution volumetrically.
3. Standardize the given HCl solution volumetrically.
4. Determine the exact molarity of the Na₂CO₃ solution volumetrically.
5. Determine the exact molarity of a solution of oxalic acid volumetrically.
6. Demonstrate that some natural substances are weak acids.
7. Classify substances as acidic, basic or neutral.
8. Identify aldehydes using Fehling's test and Tollen's test.
9. Identify ketones using 2,4-dinitrophenyl hydrazine test.
10. Identify carboxylic acids using sodium carbonate test.
11. Identify phenol using Ferric Chloride test.
12. Identify saturated and unsaturated organic compounds by KMnO₄ test.
13. Demonstrate that sugar decomposes into elements and other compounds.
14. Demonstrate the softening of water by removal of calcium and magnesium ions from hard water.

Prescribed Book: Chemistry for Part – II (Class – X)

Authors: Dr. Jalil Tariq , Dr. Irshad Ahmad Chatha

Published by: The Carvan Book House, Lahore

For: Punjab Curriculum and TextBook Board, Lahore

