



CHEMISTRY

Detailed Chapter-wise Analysis

1. Some Basic Concepts of Chemistry

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Atoms and Molecules	1	0	0	0	0	0	1	0	0	1
Empirical And Molecular Formula	0	1	0	0	1	0	2	0	2	0
Concentration Terms & Application	0	0	1	0	0	0	1	1	0	0
Stoichiometry And Stoichiometric Calculations	0	0	2	2	0	0	4	0	1	3
Miscellaneous	0	0	0	1	0	0	1	0	0	1
Mole	0	0	0	0	1	1	2	0	1	1
Dalton's Atomic Theory	0	0	0	0	0	1	1	1	0	0
Total	1	1	3	3	2	2	12	2	4	6

Summary: The "Some Basic Concepts of Chemistry" chapter contributed **12 questions**, with a significant number of **Hard questions (6 questions)**, alongside 2 Easy and 4 Medium questions.

Insights:

- **Stoichiometry And Stoichiometric Calculations** is a frequently tested topic and often features **Hard difficulty**.
 - Understanding **Empirical And Molecular Formula** and **Mole Concept** is also crucial.
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2. Redox Reaction

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Oxidation Number	1	0	1	0	1	1	4	2	1	1
Types of Redox Reaction	0	1	0	0	0	0	1	0	1	0
Balancing of Redox Reaction	0	0	0	1	0	0	1	0	0	1
Total	1	1	1	1	1	1	6	2	2	2

Summary: "Redox Reaction" provided **6 questions**, with an **even distribution across Easy (2 questions), Medium (2 questions), and Hard (2 questions)**.

Insights:

- **Oxidation Number** is a consistently tested topic.
 - Understanding different **Types of Redox Reactions** and **Balancing Redox Reactions** is crucial, sometimes appearing with **Hard difficulty**.
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3. Solutions

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Colligative Properties	1	1	0	0	1	2	5	1	1	3
Ideal And Non-Ideal Solutions	1	0	0	0	0	0	1	0	1	0
Vapour Pressure of Liquid Solutions	0	1	0	0	0	1	2	0	0	2
Solubility	0	0	0	1	1	0	2	1	1	0
Binary Solution	0	0	0	0	0	1	1	0	1	0
Total	2	2	0	1	2	4	11	2	4	5

Summary: The "Solutions" chapter accounted for **11 questions**, with a significant number of **Hard questions (5 questions)** and Medium questions (4 questions).

Insights:

- **Colligative Properties** and **Vapour Pressure of Liquid Solutions** are frequently examined topics, often with **Hard difficulty**.
 - A thorough understanding of these concepts and their applications is crucial.
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4. Thermodynamics

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Change in Thermodynamics Properties in Expansion or Contraction of a Gas	1	1	0	0	0	0	2	0	2	0
Spontaneity: Second Law of Thermodynamics	1	0	0	0	1	0	2	0	0	2
Relationship Between Heat of Reaction at Constant Pressure and that at Constant Volume	0	1	0	0	0	0	1	1	0	0
Pressure-Volume Work	0	0	1	0	0	0	1	0	1	0
Gibbs Energy Change and Non-Mechanical Work	0	0	0	1	0	0	1	0	1	0
Measurement of dU and dH: Bomb Calorimeter	0	0	0	1	0	0	1	1	0	0
Thermodynamic Processes	0	0	0	0	2	0	2	0	2	0
Enthalpy Change	0	0	0	0	0	1	1	0	0	1
Total	2	2	1	2	3	1	11	2	6	3

Summary: The "Thermodynamics & Thermochemistry" chapter provided **11 questions**, with a balanced distribution across **Medium (6 questions)**, **Hard (3 questions)**, and **Easy (2 questions)** difficulties.

Insights:

- Topics related to the **Second Law of Thermodynamics (Spontaneity and Entropy)** and **Thermodynamic Processes** are consistently tested and can involve **Hard questions**.
 - Understanding different forms of energy change and work in thermodynamic processes is essential.
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5. Equilibrium

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Solubility And Solubility Product	1	0	0	0	0	0	1	0	1	0
Relationship Between Equilibrium Constant (K), Reaction Quotient (Q) and Gibbs Free Energy (G)	1	0	0	1	0	0	2	0	1	1
Different Theory For Acid And Base	0	2	0	1	0	0	3	2	1	0
pH-Calculation	0	0	1	0	0	0	1	0	1	0
Application of Equilibrium Constant	0	0	1	0	2	0	3	1	2	0
Equilibrium Constant of Various Equilibrium	0	0	0	0	0	1	1	0	0	1
Le Chatelier'S Principle	0	0	0	0	0	1	1	0	1	0
Total	2	2	2	2	2	2	12	3	7	2

Summary: The "Equilibrium" chapter (covering both chemical and ionic equilibrium topics) contributed **12 questions**, mostly of **Medium difficulty (7 questions)**, with some Easy (3 questions) and Hard (2 questions).

Insights:

- Topics related to **Acids and Bases**, **Equilibrium Constant**, and its relationship with **Gibbs Free Energy** are frequently asked.
 - Understanding **pH calculations** and **Le Chatelier's Principle** is crucial.
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6. Electrochemistry

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Electrolysis	1	0	1	0	0	0	2	1	0	1
Quantitative Aspects of Electrolysis And Faraday's Laws	1	0	0	0	2	0	3	0	1	2
Kohlrausch's Law	0	1	0	0	0	0	1	0	0	1
Measurement of Conductance and Conductivity of Ionic Solutions	0	1	0	0	0	0	1	0	0	1
Electrochemical Series	0	0	1	0	0	0	1	0	0	1
Nernst Equation	0	0	1	0	0	0	1	0	1	0
Determination of Cell Constant	0	0	0	1	0	0	1	1	0	0
Molar Conductivity	0	0	0	0	0	1	1	0	1	0
Total	2	2	3	1	2	1	11	2	3	6

Summary: The "Electrochemistry" chapter accounted for **11 questions**, with a significant number of **Hard questions (6 questions)**.

Insights:

- **Quantitative Aspects of Electrolysis And Faraday'S Laws** and topics like **Kohlrausch's Law** and **Electrochemical Series** are frequently tested and often challenging.
 - A strong grasp of the principles of electrolysis and conductivity is essential.
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7. Chemical Kinetics

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Activation Energy	1	1	0	1	1	0	4	1	2	1
Integrated Rate Equations	0	0	1	0	0	2	3	0	2	1
Rate constant	0	0	1	0	1	0	2	1	1	0
Experimental Determination of Order of Reaction	0	0	0	1	0	0	1	0	0	1
Temperature Dependence of The Rate of A Reaction	0	1	0	0	0	0	1	0	0	1
Ratio of Two Rate Constant at Two Different Temperatures	0	0	0	0	1	0	1	0	0	1
Potential Energy Curve	0	0	0	0	0	1	1	0	1	0
Total	2	2	2	2	3	3	13	2	6	5

Summary: The "Chemical Kinetics" chapter generated **13 questions**, with a notable number of **Hard questions (5 questions)** alongside Easy (2 questions) and Medium (6 questions).

Insights:

- **Activation Energy** and **Integrated Rate Equations** are frequently examined topics, often including **complex problems**.
- Understanding the factors affecting reaction rates, rate constants, and the temperature dependence of reactions is critical.



8. Structure of Atom

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Bohr's Model For Hydrogen Atom	1	1	1	0	1	2	6	1	4	1
Quantum Mechanical Model of The Atom	0	0	1	1	1	0	3	0	1	2
Some Important Atomic Terms	0	0	0	0	0	1	1	1	0	0
Total	1	1	2	1	2	3	10	2	5	3

Summary: The "Structure of Atom" chapter provided **10 questions**, with a majority being **Medium difficulty (5 questions)**, and some Easy (2 questions) and Hard (3 questions).

Insights:

- **Bohr's Model For Hydrogen Atom** is a highly recurring topic, appearing every year and covering various aspects like limitations, energy of electrons, and radius of shells.
 - Understanding the **Quantum Mechanical Model of The Atom** and concepts like quantum numbers is also important, often featuring **Hard difficulty**.
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9. Classification of Elements and Periodicity in Properties

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Nomenclature of Elements With Atomic Number > 100	1	0	1	0	0	0	2	1	0	1
Effective Nuclear Charge	0	0	0	1	0	0	1	1	0	0
Periodic Properties	0	0	0	0	2	1	3	1	1	1
Electronic Configuration of Elements And The Periodic Table	0	0	0	0	0	1	1	0	1	0
Total	1	0	1	1	2	2	7	3	2	2

Summary: This chapter provided **7 questions** with a balanced difficulty, including 3 Easy, 2 Medium, and 2 Hard questions.

Insights:

- **Nomenclature of Elements With Atomic Number > 100** and **Periodic Properties (like ionization energy and electronegativity)** are recurring topics.
 - Foundational knowledge of periodic trends and electron configuration is important.
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10. Chemical Bonding and Molecular Structure

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Bond Parameters	1	0	1	1	0	1	4	0	2	2
Dipole Moment	1	1	0	0	1	0	3	0	2	1
Kössel - Lewis Approach To Chemical Bonding	0	0	1	1	0	0	2	1	1	0
Valence Shell Electron Pair Repulsion (VSEPR) Theory	0	1	1	0	1	0	3	0	2	1
Hybridisation	0	1	0	0	1	0	2	0	2	0
Hydrogen Bonds	0	0	0	0	1	0	1	1	0	0
Molecular Orbital Theory (MOT)	0	0	0	0	0	1	1	1	0	0
Total	2	3	3	2	4	2	16	3	9	4

Summary: "Chemical Bonding And Molecular Structure" is a significant chapter, yielding **16 questions** over the six years. Questions displayed a **diverse difficulty**, with 3 Easy, 9 Medium, and 4 Hard questions.

Insights:

- Topics like **Bond Parameters**, **Dipole Moment**, and **Valence Shell Electron Pair Repulsion (VSEPR) Theory** are consistently tested, often with **Medium to Hard difficulty**.
 - Understanding various bonding theories and their applications is crucial.
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11. Some Basic Principles And Techniques

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Methods of Purification of Organic Compounds	1	0	0	0	1	1	3	2	0	1
Reaction Intermediate	1	0	0	0	1	0	2	1	1	0
Nomenclature of Organic Compounds	0	1	1	0	1	1	4	2	1	1
Isomerism	0	1	0	0	1	1	3	1	1	1
Qualitative Analysis of Organic Compounds	0	0	1	1	0	1	3	0	2	1
Aromaticity	0	0	0	1	0	0	1	0	1	0
General Introduction	0	0	0	0	1	0	1	0	1	0
Hyperconjugation Effect	0	0	0	0	0	1	1	0	1	0
Total	2	2	2	2	4	5	17	6	8	4

Summary: This chapter is significant, with **17 questions** over the years. Difficulty was balanced, with 6 Easy, 8 Medium, and 4 Hard questions.

Insights:

- **Nomenclature of Organic Compounds, Methods of Purification, and Qualitative Analysis** are consistently tested.
 - Understanding **Isomerism, Reaction Intermediates, and electronic displacement effects (like Hyperconjugation)** is important, often appearing with **Medium to Hard difficulty**.
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12. Hydrocarbon

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Preparation of Alkene	1	1	0	0	0	0	2	1	1	0
Chemical Properties of Alkene	1	1	1	0	1	1	5	1	2	2
Preparation of Alkane	1	1	0	0	0	0	2	0	2	0
Conformations	0	1	0	0	0	0	1	0	1	0
Aromatic Hydrocarbon	0	0	1	1	0	1	3	0	1	2
Chemical Properties of Alkane	0	0	0	1	0	0	1	0	1	0
Physical Properties of Alkane	0	0	0	0	1	0	1	0	1	0
Test of Unsaturation of Alkene	0	0	0	0	0	1	1	1	0	0
Total	3	4	2	2	2	3	16	3	9	4

Summary: The "Hydrocarbon" chapter yielded **16 questions**, with a majority being **Medium difficulty (9 questions)**, and some Easy (3 questions) and Hard (4 questions).

Insights:

- **Chemical Properties of Alkenes** and **Aromatic Hydrocarbons** are frequently tested topics, often with varied difficulty.
 - Understanding the preparation methods and chemical reactions of alkanes, alkenes, and aromatic compounds is essential.
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13. Haloalkanes and Haloarenes

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Chemical Properties	1	1	0	0	1	0	3	2	1	0
Nature of C-X Bond	0	1	0	0	0	0	1	0	1	0
Stereochemical Aspects of Nucleophilic Substitution Reactions	0	0	1	0	0	1	2	2	0	0
Preparation of Haloarenes	0	0	1	0	0	0	1	1	0	0
Classification of Haloalkanes & Haloarenes	0	0	0	1	0	0	1	1	0	0
Preparation of Haloalkanes	0	0	0	0	1	0	1	0	1	0
Isomerism	0	0	0	0	0	1	1	0	0	1
Total	1	2	2	1	2	2	10	6	3	1

Summary: The "Haloalkanes and Haloarenes" chapter contributed **10 questions**, with a strong focus on **Easy difficulty (6 questions)**.

Insights:

- **Chemical Properties and Stereochemical Aspects of Nucleophilic Substitution Reactions** are recurring topics, often appearing at Easy difficulty.
 - Basic understanding of classification, preparation, and reaction mechanisms is key.
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14. Alcohols, Ethers and Phenols

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Ethers	1	0	0	1	0	1	3	0	1	2
Phenols	0	0	1	0	0	0	1	0	1	0
Alcohols	0	0	1	1	2	0	4	1	3	0
Total	1	0	2	2	2	1	8	1	5	2

Summary: The "Alcohols, Phenols and Ethers" chapter had **8 questions** over the years, mainly focusing on **Medium difficulty (5 questions)**, with some Easy (1 question) and Hard (2 questions) questions.

Insights:

- Questions on **Alcohols and Ethers** have appeared consistently, with "Ethers" sometimes featuring **Hard difficulty questions**.
 - A broad understanding of the chemical properties of these functional groups is important.
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15. Aldehydes, Ketones and Carboxylic Acids

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Methods of Preparation For Aldehydes	1	0	0	0	0	1	2	0	1	1
Chemical Reactions of Aldehydes And Ketones	2	3	3	3	1	1	13	1	6	6
Physical Properties of Aldehydes And Ketones	0	0	1	0	0	0	1	0	1	0
Carboxylic Acid	0	0	1	0	0	1	2	1	0	1
Total	3	3	5	3	1	3	18	2	8	8

Summary: The "Aldehydes, Ketones and Carboxylic Acids" chapter contributed **18 questions** across the six years. Questions were **well-distributed in difficulty**, with 2 Easy, 8 Medium, and 8 Hard questions.

Insights:

- **Chemical Reactions of Aldehydes And Ketones** is a consistently important topic, appearing multiple times with varying difficulty levels, often including **Hard questions**.
 - "Methods of Preparation For Aldehydes" and "Carboxylic Acid" also appear with a mix of Medium and Hard difficulty.
 - Understanding both the preparation methods and the diverse chemical reactions of aldehydes, ketones, and carboxylic acids is crucial.
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16. Amines

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Chemical Reactions of Amines & Anilines	1	2	2	2	1	1	9	1	5	3
Preparation of Amines	0	0	0	0	1	0	1	0	1	0
Diazonium Salts	0	1	0	0	0	1	2	0	2	0
Total	1	3	2	2	2	2	12	1	8	3

Summary: This chapter provided **12 questions**, with a balance between **Medium (8 questions)** and **Hard (3 questions)** difficulties.

Insights:

- **Chemical Reactions of Amines & Anilines** is a highly tested topic, consistently appearing each year and encompassing a range of difficulties.
- Understanding the basic character of amines and reactions like the Carbylamine Reaction is crucial.



17. Biomolecules

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Disaccharides	2	0	0	0	0	0	2	0	1	1
Proteins	1	0	0	0	0	0	1	1	0	0
Vitamins	0	1	0	1	0	1	3	1	2	0
Enzymes	0	0	1	0	0	0	1	0	1	0
Nucleic Acids	0	0	0	1	0	0	1	1	0	0
Glucose	0	0	0	0	1	0	1	0	1	0
Monosaccharides	0	0	0	0	0	1	1	1	0	0
Total	3	1	1	2	1	2	10	5	5	1

Summary: The "Biomolecules" chapter accounted for **10 questions**, predominantly of **Easy (5 questions)** and **Medium (5 questions)** difficulty.

Insights:

- Topics like **Disaccharides and Vitamins** are recurring, highlighting the importance of understanding the basic properties and biological roles of these molecules.
 - Questions tend to be straightforward, emphasizing **foundational knowledge of biomolecules**.
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18. Coordination Compound

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Ligand Field Theory	1	0	1	0	0	1	3	1	0	2
Chelation and Denticity	0	1	0	0	0	0	1	0	1	0
Magnetism	0	1	0	0	1	1	3	0	2	1
Nomenclature of Coordination Compounds	0	0	1	0	0	0	1	0	0	1
Coordination Compounds	0	0	0	1	0	0	1	0	1	0
Stability of Coordination Compounds	0	0	0	1	0	0	1	0	1	0
Isomerism In Coordination Compounds	0	0	0	0	1	1	2	0	1	1
Definitions of Some Important Terms Pertaining To Coordination Compounds	0	0	0	0	1	0	1	1	0	0
Werner'S Theory of Coordination Compounds	0	0	0	0	0	1	1	1	0	0
Application of Coordination Compounds	0	0	0	0	0	1	1	1	0	0
Total	2	2	2	2	3	5	18	4	6	8

Summary: This chapter is significant, contributing **18 questions** with a notable number of **Hard questions (8 questions)**, alongside Easy (4 questions) and Medium (6 questions).

Insights:

- **Ligand Field Theory, Magnetism, and Isomerism In Coordination Compounds** are frequently tested topics, often featuring **Hard difficulty**.
- Understanding the nomenclature, bonding theories (VBT, CFT), and stability of coordination compounds is essential.

19. d and f Block Elements

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
General Properties of Transition Elements (d-block)	2	1	0	2	1	1	7	0	4	3
The Inner Transition Elements	1	0	1	0	0	0	2	0	2	0
Some Important Applications of d and f Block Elements	1	1	0	0	0	0	2	0	2	0
Chemical Properties	0	0	1	2	2	0	5	3	2	0
The Lanthanoids	0	0	0	0	1	0	1	0	0	1
Total	4	2	2	4	4	1	17	3	10	4

Summary: This chapter is significant, contributing **17 questions** over the six years. Questions were predominantly of **Medium difficulty (10 questions)**, with some Easy (3 questions) and Hard (4 questions).

Insights:

- **General Properties of Transition Elements (D-Block)**, including trends in standard electrode potentials, catalytic, and magnetic properties, are consistently tested and can be **challenging**.
 - **Chemical Properties of d- and f-block elements** are also frequently asked, often at Easy to Medium difficulty.
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20. The p-Block Elements (Group 13,14,15, 16, 17, 18)

Chapter: P-Block Element (Group 13 And 14)

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Allotropes of Carbon	1	0	1	1	0	0	3	1	2	0
Important Trends And Anomalous Behaviour of Carbon	1	0	0	0	0	0	1	0	1	0
Total	2	0	2	2	0	0	6	1	5	0

Summary: The "P-Block Element (Group 13 And 14)" chapter provided **6 questions**, mostly of **Medium difficulty (5 questions)**.

Insights:

- **Allotropes of Carbon** is a recurring topic, often at Medium difficulty.
- Understanding the general trends and anomalous behavior of elements in these groups, particularly carbon and boron compounds, is important.

Chapter: The p-Block Elements (XII)

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Oxoacids of Sulphur	1	0	0	1	0	0	2	1	0	1
Group 17 Elements	1	0	1	0	0	0	2	1	1	0
Group 18 Elements	0	1	0	0	0	1	2	1	0	1
Group 16 Elements	0	0	1	0	2	0	3	1	2	0
Classification of Oxides Based on Chemical Behaviour	0	0	0	1	0	0	1	0	1	0
Group 15 Elements	0	0	0	0	0	1	1	0	1	0
Total	2	1	2	2	2	2	11	4	5	2

Summary: The "The p-Block Elements (XII)" chapter had **11 questions**, primarily of **Medium (5 questions) and Easy (4 questions) difficulty**.



Insights:

- Questions are spread across various groups (15, 16, 17, 18), indicating a need for a **broad understanding of their properties, compounds (like Oxoacids of Sulphur), and reactivity**.
 - **Group 16 Elements** have appeared consistently.
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21. Salt Analysis

Topic	2020	2021	2022	2023	2024	2025	Total Questions	Easy	Medium	Hard
Test for Nitrogen, Sulphur and Halogens (Lassaigne's Test)	0	0	0	1	0	1	2	0	2	0
Introduction	0	0	0	0	1	0	1	0	1	0
Test of Cation	0	0	0	0	0	1	1	0	1	0
Total	0	0	0	1	1	2	4	0	4	0

Summary: The "Practical Chemistry (Salt analysis)" chapter had **4 questions**, all of **Medium difficulty**.

Insights:

- Questions related to **Qualitative Analysis of Organic Compounds** and **Test of Cation** are observed, suggesting an emphasis on **practical skills and tests**.