

5 MARK

7 × 5 = 35

SECTION – A

1. ATOMIC STRUCTURE – II Q.NO: 52

1. Discuss the Davisson and Germer's experiment. (*March-2007*)
2. Derive de-Broglie equation. What is its significance?
(*Oct-06,13, June-07, Mar-11*)
3. Discuss the shapes of s, p, and d orbital's. (*Mar, June-06*)
4. Briefly explain Molecular Orbital Theory. (*Mar-08,J-12,O-12*)
5. Explain the formation of O₂ molecule by Molecular Orbital Theory.
(*Mar, June-06,07 Oct-07,11, Mar-10,13*)
6. Describe about the electronic configuration of molecule and its correlation with Molecular behaviour. (*Oct-07*)
7. Explain the formation of N₂ molecule by Molecular Orbital Theory.
(*Oct-08, 10, June-08,09,10,11*)

ADDITIONAL 5 MARKS

8. Discuss the Thomson experiment.
9. What is mean by Hydrogen bonding? Explain its types.

4. d-BLOCK ELEMENTS Q.NO:53

1. Explain briefly the extraction of copper from its chief ore.
2. Explain how gold is extracted from its alluvial gravel.
(*Oct-06, 09,12,13, June-07, 10,13, Mar-08,10*)
3. How is Silver extracted from Argentite?
(*June-06,08, Oct-06,07,M-12,13*)
4. Briefly explains the extraction of Zinc from Zinc blende.
(*June-09,11,12, Oct-10, Mar-06,11*)

5. Explain how potassium dichromate is extracted from its chromite ore?

(Mar-07, 10, O-11)

6. How chromium is extracted from its chromite ore?

i) Aluminio thermic process: *(Mar-09, O-08)*

ADDITIONAL QUESTIONS

7. Explain the action of copper sulphate with the following reagents.

i) NH_4OH ii) KI iii) KCN iv) NaOH v) H_2S

8. Explain the extraction of silver from silver coins.

5. f-BLOCK ELEMENTS Q.NO:54

1. What is Lanthanide contraction? Discus its causes and consequences.

(Mar-06, 07, 09,12, Oct-07,11,J-12,O-12,M-13,J-13)

2. Describe the extraction of Lanthanides from Monazite sand.

(Oct-06, 10, June-07,11, Mar-10)

3. Write the uses of Lanthanides and Actinides. *(Mar-06, Oct-08, 09, June-09)*

4. Compare and contrast the properties of Lanthanides and Actinides.

(Mar-06, 10,11, June-08,10)

5. Discuss the position of lanthanides in the periodic table. *(M-08, O-13)*

6. What is Actinide contraction? Discus its causes and consequences.

6. COORDINATION COMPOUNDS Q.NO: 55,65(a)

1. Explain Linkage isomerism ,Ligand isomerism and hydrate isomerism with suitable examples? *(M-10)*

2. Explain coordination and ionization isomerism with suitable examples?

(June-07,09,12, Mar-08,12,13, Oct-08, 10)

3. Explain the postulates of Werner`s theory. Postulates of Werner`s theory.

(Mar-06, June-06, 07, 08, 10,11, Oct-07, 09, 10,12,13)

4. Explain the postulates of Valence Bond Theory. *(Mar-09,12)*

5. Mention the type of hybridization and magnetic property of the following complexes using VB Theory. (*Mar-06,11,09,J-11,13,O-11,12,*)
 1) $[\text{FeF}_6]^{4-}$, 2) $[\text{Fe}(\text{CN})_6]^{4-}$
6. $[\text{Ni}(\text{CN})_4]^{2-}$ Diamagnetic, whereas $[\text{NiCl}_4]^{2-}$ Paramagnetic. Explain. (*June-06, Mar-07,M-13,J-08,10,12*)
7. $[\text{Ni}(\text{CN})_4]^{2-}$ is a diamagnetic where as $[\text{Ni}(\text{NH}_3)_4]^{2+}$ is paramagnetic explain? (*June-08,09, 10, Oct06*)
8. For the complexes $\text{K}_4[\text{Fe}(\text{CN})_6]$, $[\text{Cu}(\text{NH}_3)_4] \text{SO}_4$, $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$
 $\text{K}_3[\text{Cr}(\text{C}_2\text{O}_4)_3]3\text{H}_2\text{O}$ mention
 (a) Name (b) Central metal ion (c) Ligands (d) Coordination number
 (e) Geometry. (*Oct-06, 07, Ma-07, 11,J-09,13O-09,13*)
9. How is Chlorophyll important environmental chemistry? Mention its functions. (*Mar-08*)
10. Mention the function of Hemoglobin in natural process. (*Mar-10*)
11. Explain the following terms i) neutral ligand ii)chelates iii)coordination sphere iv)coordination number v)negative ligands (*O-08*)

SECTION – B

9. THERMODYNAMICS – II.

Q.No: 56

1. State the various statements of Second law of Thermodynamics.
 (*June-10, Oct-06, 09, 10,11,13, Mar-08, 10,13*)
2. Write characteristics of Free energy 'G'.(*J-07,09,11,Oct-07,Mar-07 11*)
3. Write characteristics of Entropy 'S'.

June-08,13, Oct-08,11,12 Mar-09,12

4. State Trouton`s rule. Explain about the substances that deviate from this rule. (J-12)
5. What are spontaneous reactions? What are the conditions for the spontaneity of a process?

10. CHEMICAL EQUILIBRIUM – II Q.No: 57

1. Derive the relation $K_p = K_c (RT)^{\Delta n_g}$ for a general chemical equilibrium reaction. (June-07, Oct-08, 10, Mar-06, 10,12)
2. Derive the expression for K_c and K_p for Decomposition of PCl_5 .
(Mar-07, 11,13,J-12,O-11,13)
3. Derive the values of K_c and K_p for the formation of HI. (Oct-09)
4. Describe the synthesis of NH_3 by Haber`s process.(June-06,10,11, Mar-08)
5. Write synthesis of SO_3 by Contact process. (Oct-07,13, June-08, Mar-09)
6. State Le Chatelier`s principle. Discuss the effect of pressure and temperature on the following reaction. (June-09,O-12)



SECTION – C

17. ETHERS Q.NO:60

1. Write all possible isomers with Molecular formula $C_4H_{10}O$ and name them.
2. Give any three methods of preparation of Diethyl ether.
(June-07, Mar-06, 08, 10,13)
3. Give any three methods of preparation of anisole and explain the reaction of HI anisole. (J-08,12, 13,Mar-09,O-12,)

4. How does Diethyl ether react with the following reagents?(**M-07,J-11**)

(a) O_2 /long contact (b) HI in excess (c) PCl_5 (d) dilute H_2SO_4

5. How will you distinguish between Aromatic and Aliphatic ethers?

(**J-10,M-11,O-11,M-12,O-13**)

6. Explain the isomerism exhibited by ethers. (**June-06, Oct-07**)

6. How does diethyl ether react with the following reagents?

(i) Cl_2 / dark (ii) Cl_2 / sunlight (iii) con.HCl (iv) BF_3

7. How does diethyl ether react with the following reagents. (**O-10**)

(i) Con. H_2SO_4 (ii) CH_3MgI (iii) small amount of HI (iv) excess of HI

22. CHEMISTRY IN ACTION Q.NO:63

1. Write briefly on antibiotics. In what way antispasmodics are helpful?

2. Explain briefly on characteristics of Rocket propellants.

(**June-06, 07, 08, 10, Oct-07,11, Mar-09,11**)

3. Explain briefly on colour and structure of dyes. (**Oct-08,09,10,13,J-12**)

(Or) explain the ottowitt theory about dyes with suitable examples.

(Or) what are chromophores and auxochromes?give two example for each.(**O-08,J-11,O-12**)

4. Explain about (a) Analgesics (b) Antipyretics (c) Antioxidants

(d) Antiseptic.

5. How are Buna-S Buna-N and Nylon -66 prepared? Explain their uses?

(**Mar-07, 08,13,12**)

6. Write a note on Anaesthetics. (**Oct-06, June-13, Mar-10**)

10 MARK

4 × 10 = 40

2. PERIODIC CLASSIFICATION–II Q.NO:64 (a)

1. Explain Pauling method to determine ionic radii.

(Oct-09,10,11, June-10, Mar-06,10,12).

2. Explain the various factors that affect Electron Affinity.

(June, Oct-06,13, June-07,12, Mar-09,07,09)

3. Describe about the factors governing Ionisation Energy. (or) Factors governing Ionisation Energy. *(Oct-08,J-08,13)*

4. Describe about the Pauling's scale of determination of electro negativity.give the disadvantage of pauling scale. *(M-08,13,O-12)*

5. Write the Applications of Electro negativity. *(June-09, Mar-11)*

(Or)

How do electronegativity values help to find out the nature of bonding between atoms? *(O-07,J-09)*

(Or)

Explain How do electronegativity values help to find out the percentage of ionic character in polar covalent bond.*(O-08)*

ADDITIONAL QUESTION

6. How is atomic radii calculated from covalent bond length?

7. Explain the variation of IE along the group and period.

3. P-BLOCK ELEMENTS

Q.NO: 64(b)

1. What are silicones? How are they prepared? Mention its uses.

(M-07,12,O-12)

2. Give an account of manufacture of Lead. *(J-08,O-11)*

3. How fluorine is isolated from their fluorides?by dennis method.

(Mar-06,Oct-09,J-11,13)

4. Give a detailed account of the Interhalogen compounds with special reference to the compounds involving iodine. Draw their structures.
(Or) discuss the structure of interhalogen compounds AX and AX₅. (O-08)
5. Describe in detail how noble gases are isolated from air?
Ramsay-Raleigh's Method : (Jun, Oct-06, Mar-10, O-13)
6. Describe in detail how noble gases are isolated from air by Dewar's method. (June-09, Mar-11, J-12)
7. Explain the anomalous nature of fluorine. (Mar-08, 09, June-10, O-10)
(Or) How does fluorine differ from other halogens? (M-13)
8. How does NaOH react with H₃PO₃ and H₃PO₄. (June-07)
9. Illustrate i) tribasic nature of orthophosphoric acid .
ii) reducing property of phosphorous acid. (J – 07)

7. NUCLEAR CHEMISTRY Q.NO: 65(B)

1. Differentiate Chemical reactions from Nuclear reactions.
(Mar-09, 11, 12, J-12)
2. What is nuclear fission? What are Controlled and Uncontrolled fission reactions? (June-08)
3. Write note on Radio carbon dating. (J-06, 10, Oct-06, 07, 10, Mar-08, 10, 13)
4. Explain about the nuclear reactions taking place in sun. (J-07, O-12, 13)
5. Explain the use of radioactive isotopes with specified examples.
i) study of hydrolysis of ester .
ii) mechanism of photosynthesis in plants. (Oct-08)
6. Explain the principle behind Hydrogen Bomb. (Mar-06, 07, O-11)
7. Write the Medicinal uses of radioactive isotope. (M-06, J-09, 11, 13)

8. Differentiate Nuclear Fusion from Nuclear fission? (Oct-09)

8. SOLID STATE-II Q.NO:66(a).

1. Explain Schottky and Frankel defects.

(Mar-06, 09,13,12, June-10, Oct-08, 10,12,13)

2. What is super conductivity? Give its uses. (June-08,11,12)

3. Explain Bragg`s Spectrometer method. (June-06, 09,Mar-08,10o-07,09)

4. Explain the nature of glass. (Mar-07,J-13)

5. Write the characteristics of Ionic Crystals. (June-07, Mar-11,0-11)

Additional questions

6. Write Bragg`s equation. Give its significance.

7. Explain the various types of crystals based on lattice points.

8. Explain AB and AB₂ type ionic crystals with one example for each.

12. SURFACE CHEMISTRY Q.NO:66(B)

1. Distinguish between Physical adsorption and Chemical adsorption.

(June-08,13)

2. Write notes on: i) Positive catalyst ii) Negative catalyst

iii) Auto catalyst iv) Induced catalyst. V) promoters (O-09)

3. Write briefly about the Intermediate compound formation theory of catalysis. (Mar-07, Oct-08,J-11,12)

4. Write briefly about Adsorption theory of catalysis. (Mar-06,09,13)

5. Write the Applications of Catalysis.

6. Write briefly about the preparation of colloids by Dispersion method.

(June-06, Mar-08,O-13)

7. Write briefly about the preparation of colloids by condensation methods.

(Or) Explain the chemical methods of preparing colloids.?

(M-12,10,J-07,10,O-10)

8. Write notes on : i) Dialysis ii) Electro dialysis iii) Ultrafiltration

9. Explain about electrophoresis.

10. Write the Application of Colloids.

11. What is electroosmosis? explain. **(O-07,J-08)**

12. Write notes on i) brownian movement ii) Tyndall effect

iii) Helmholtz double layer

13. write the general characteristic of catalytic reaction **(O-11)**

14. Discuss the factors affecting adsorption. **(O-12)**

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