



PART - I

Note : i) Answer all the questions. ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer. $15 \times 1 = 15$

1. In the extraction of aluminium from alumina by electrolysis, cryolite is added to
 - a) Lower the melting point of alumina
 - b) Remove impurities from alumina
 - c) Decrease the electrical conductivity
 - d) Increase the rate of reduction
2. Carbon atoms in fullerene with formula C_{60} have
 - a) sp^3 hybridised
 - b) sp hybridised
 - c) sp^3 hybridised
 - d) partially sp^3 and partially sp^3 hybridised
3. Among the following the correct order of acidity is
 - a) $HClO_2 < HClO < HClO_3 < HClO_4$
 - b) $HClO_4 < HClO_2 < HClO < HClO_3$
 - c) $HClO_3 < HClO_4 < HClO_2 < HClO$
 - d) $HClO < HClO_2 < HClO_3 < HClO_4$
4. The vacant space in fcc lattice unit cell is
 - a) 48%
 - b) 23%
 - c) 32%
 - d) 26%
5. For the reaction, $2NH_3 \rightarrow N_2 + 3H_2$, if $\frac{-d[NH_3]}{dt} = k_1[NH_3]$, $\frac{+d[N_2]}{dt} = k_2[NH_3]$, $\frac{+d[H_2]}{dt} = k_3[NH_3]$ then the relation between k_1 , k_2 and k_3 is
 - a) $k_1 = k_2 = k_3$
 - b) $k_1 = 3k_2 = 2k_3$
 - c) $1.5k_1 = 3k_2 = k_3$
 - d) $2k_1 = k_2 = 3k_3$
6. The solubility of $AgCl(s)$ with solubility product 1.6×10^{-10} in 0.1M NaCl solution would be
 - a) $1.26 \times 10^{-5} M$
 - b) $1.6 \times 10^{-9} M$
 - c) $1.6 \times 10^{-11} M$
 - d) Zero
7. Williamson synthesis of preparing dimethyl ether is a/an
 - a) SN_1 reaction
 - b) SN_2 reaction
 - c) electrophilic addition
 - d) electrophilic substitution
8. Ethanoic acid $\xrightarrow{P/Br_2}$ 2 - bromoethanoic acid. This reaction is called
 - a) Finkelstein reaction
 - b) Haloform reaction
 - c) Hell-Volhard - Zelinsky reaction
 - d) None of these
9. Carbolic acid is
 - a) Phenol
 - b) Picric acid
 - c) Benzoic acid
 - d) Phenylacetic acid
10. Assertion : p - N, N - dimethyl amino benzaldehyde undergoes benzoin condensation
Reason : The aldehydic (-CHO) group is meta directing.
 - a) if both assertion and reason are true and reason is the correct explanation of assertion
 - b) If both assertion and reason are true and reason is not the correct explanation of assertion.
 - c) assertion is true but reason is false
 - d) both assertion and reason are false
11. The pH of 10^{-3} M HCl solution will be
 - a) 11
 - b) -3
 - c) 3
 - d) 7
12. The rate constant of first order reaction is 10^{-3} min^{-1} . The half-life period of reaction is
 - a) 693 min
 - b) 69.3 min
 - c) 6.93 min
 - d) 0.693 min
13. Which of the following set represents only coloured ions?
 - (1) Fe^{3+}
 - (2) Se^{3+}
 - (3) Cu^{+}
 - (4) C^{3+}
 - a) 1,3
 - b) 2, 3, 4
 - c) 1, 4
 - d) 1, 3, and 4
14. Which of the following does not give oxygen on heating?
 - a) $K_2Cr_2O_7$
 - b) $(NH_4)Cr_2O_7$
 - c) $KClO_3$
 - d) $Zn(ClO_3)_2$

15. How many unpaired electrons are present in Mn^{2+} ?
 a) 3 b) 4 c) 2 d) 5

PART - II

Note : Answer any six questions. Question No. 24 is compulsory. $6 \times 2 = 12$

16. Explain the Gravity separation or Hydralic wash process.
 17. Give the uses of Borax.
 18. Write short note on anomalous properties of the first element of p - block.
 19. Write chromyl chloride test.
 20. What are point defects?
 21. Give the differences between order and molecularity of a reaction.
 22. Why C - O - C bond angle in ether is slightly greater than the tetrahedral bond angle?
 23. Give tests to identify Carboxylic acids.
 24. Identify the conjugate acid base pair for the following reaction in aqueous solution.
 i) $NH_4^+ + CO_3^{2-} \rightleftharpoons NH_3 + HCO_3^-$ ii) $HC_2O_4^- + PO_4^{3-} \rightleftharpoons HPO_4^{2-} + C_2O_4^{2-}$

PART - III

Note : Answer any six questions. Question No. 33 is compulsory: $6 \times 3 = 18$

25. How Potash alum is prepared?
 26. Explain the diagonal relationship of Boron with Silicon.
 27. What are the effects of Lanthanoid contraction?
 28. Distinguish between Hexagonal close packing and cubic packing.
 29. List the factors affecting recation rate.
 30. Explain common Ion effect with an example.
 31. Write a note on Metamerism.
 32. Difference between Phenol and Alcohol.
 33. What happens when Ammonia react with following compounds?
 a) Acaldehyde b) Bezaldehyde

PART - IV

Note : Answer all the questions.

$5 \times 5 = 25$

34. A) Explain the Froth Floatation process.
 (OR)
 B) i) Differentiate Diamond and Graphite.
 ii) What are inter halogen compounds? Give examples.
 35. A) Describe the preparation of potassium dichromate.
 (OR)
 B) i) Most of the transition metals and their compounds have catalytic activity
 Why?
 ii) What is Zeigler - Natta catalyst? Mention its use.
 36. A) Explain (a) Schottky defect b) Frenkel defect with examples
 (OR)
 B) Derive an expression for Oswald's Dilution law.
 37. A) Derive integrated rate law for a First order reaction.
 (OR)
 B) How will you prepare the following compounds from Phenol.
 a) Benzene b) p-hydroxy azobenzene c) Picric acid
 38. A) How will you differentiate primary, secondary and tertiary alcohols by Lucas test?
 (OR)
 B) Explain Mechanism of Aldol condensation Reaction.