



JAIN COLLEGE, JAYANAGAR
II PUC CHEMISTRY MOCK PAPER – 1

Max Marks : 70

INSTRUCTIONS:

- i) The question paper has four parts A, B, C and D. All the parts are compulsory.*
 - ii) Write balanced chemical equations and draw labeled diagrams wherever asked.*
 - iii) Use log tables and simple calculators if necessary.*
- (Use of scientific calculators is not allowed)*

PART-A

I. Answer ALL the questions (Each question carries one mark)

10x1=10

(Answer each question in one word or in one sentence)

1. What is the Vant Hoff factor for potassium sulphate in very dilute aqueous solutions?
2. State Henry's Law
3. What is a secondary cell?
4. Unit of rate constant of a reaction is same as the unit of rate of the reaction. What is the order of the reaction?
5. Name the metal that is refined by Van Arkel method.
6. Noble gases have very low boiling point. Why?
7. Give an example for heteroleptic complex.
8. Why is the boiling point of ethyl bromide higher than that of ethyl chloride?
9. Name the product obtained when acetaldehyde reacts with hydroxyl amine.
10. Which is the storage polysaccharide present in animals?

PART-B

II. Answer any FIVE of the following. (Each question carries two marks)

5x2=10

11. How many tetrahedral and octahedral voids are possible if the number of close packed spheres in two layers is N?
12. Calculate the mass of aluminium deposited at cathode when 193C of current is passed through molten electrolyte of alumina. Molar mass of Al=27gmo⁻¹ IF = 96500 Cmo⁻¹
13. What are the two criteria for effective collision according to collision theory?
14. Give reasons (i) Actinoids show variable oxidation states (ii) Zr and Hf have almost identical radii
15. How is anisole converted into 2-methoxytoluene and 4-methoxy toluene? Give the equation.
16. How is propanenitrile converted into propanal? Write the equation.

17. What are analgesics? Give an example.
18. Give one example each for (i) antiseptic (ii) synthetic detergent

PART-C

III. Answer any FIVE of the following. (Each question carries three marks) $5 \times 3 = 15$

19. How is pure alumina obtained from Bauxite by Leaching process?
20. White phosphorous is heated with excess of dry chlorine to get X. X on hydrolysis forms an oxoacid of phosphorous Y. What are X and Y. What is the basicity of the acid Y?
21. Describe the preparation of ozonized oxygen with an equation. Name the oxidized product obtained when ozone reacts with lead sulphide.
22. (i) Give two chemical properties of chlorine.
(ii) Give an example for one oxoacid of chlorine (2+1)
23. (a) What are the interstitial compounds? Write any one of their characteristics.
(b) Out of the following elements, identify the element which does not exhibit variable oxidation states Cr, Co, Zn (2+1)
24. (i) What happens when H_2S is passed into $\text{K}_2\text{Cr}_2\text{O}_7$ in acidic medium? Give the equation.
(ii) What is the composition of chromite ore? (2+1)
25. Using VBT account for the geometry and magnetic property of $[\text{CoF}_6]^{3-}$. Given outer electronic configuration of Ni : $3d^8 4s^0$
26. Give differences between $[\text{NiCl}_4]^{2-}$ and $[\text{Ni}(\text{CN})_4]^{2-}$ with respect to type hybridization, magnetic behavior and geometry.

PART-D

IV. Answer any THREE of the following. (Each question carries five marks) $3 \times 5 = 15$

27. (a) Sodium metal crystallizes in a BCC structure. Its unit cell edge length is 420 pm. Calculate its density (atomic mass of sodium = 23 u, $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$)
(b) What is Frenkel defect? How does it affect the density of a crystal? (3+2)
28. (a) Vapour pressure of liquids A and B at 298 K is 300 mm of Hg and 450 mm Hg respectively. If the total vapour pressure of the mixture is 405 mm Hg. Calculate the mole fraction of A in mixture.
(b) What happens to the solubility of a gas in a liquid with increase in temperature? Give reason. (3+2)
29. (a) Calculate standard free energy change for the reaction.
 $\text{Zn}_{(s)} + 2\text{Ag}^+_{(aq)} \rightarrow \text{Zn}^{2+}_{(aq)} + 2\text{Ag}_{(s)}$ $E^\circ_{\text{cell}} = 1.56 \text{ V}$; $1 \text{ F} = 96500 \text{ C mol}^{-1}$
(b) Write the reaction occurring at cathode and anode in $\text{H}_2\text{-O}_2$ fuel cell. (3+2)
30. (a) Derive an integrated rate equation for the velocity constant of a zero order reaction.
(b) A reaction is 50% completed in 2 hours and 75% complete in 4 hours. What is the order of reaction? Give reason. (3+2)

31. (a) Describe electrophoresis with the help of a diagram
(b) What is meant by shape selective catalysis? Give an example of shape selective catalyst. (3+2)

V. Answer any FOUR of the following. (Each question carries five marks) 4x5=20

32. (a) Write the IUPAC name of the major product formed when 2 bromopentane is heated with alcoholic KOH. Give equation. Name the reaction
(b) Aryl halides are less reactive towards nucleophilic substitution compared to alkyl halides. Give two reasons. (3+2)
33. (a) Explain the mechanism of dehydration of ethanol to ethane.
(b) How is salicylic acid converted into aspirin? Give equation (3+2)
34. (a) Explain Cannizzaro's reaction with an example
(b) Name the product obtained by the reaction of acetyl chloride with dimethylcadmium
(c) Explain the reaction between carboxylic acid and PCl_5 (2+2+1)
35. (a) Explain how is Hinsberg's reagent used to distinguish the primary, secondary and tertiary amines.
(b) Write the chemical reactions involved in the conversion of aniline into Phenol (3+2)
36. (a) What are reducing sugars? Is sucrose a reducing sugar? Give reason.
(b) (i) Write the Zwitter ion form of an α amino acid.
(ii) Name the naturally occurring α amino acid that is not optically active. (3+2)
37. (a) What is condensation polymerization? Give an example with equation.
(b) With respect to natural rubber
(i) name its monomer (ii) name the method used for vulcanization (3+2)
