

SURANA IND. PU COLLEGE, BENGALURU – 04
II PUC CHEMISTRY MODEL QUESTION PAPER – 1

Time: 3 Hours 15 minutes

Maximum Marks: 70

Instructions:

1. The question paper has four parts: A, B, C and D. All parts are compulsory.
2. Write balanced chemical equations and draw labeled diagrams wherever required.
3. Use log tables and simple calculator if necessary. (Use of scientific calculators is not allowed)

PART - A

I. Answer ALL of the following questions.

10 x 1 = 10

(Answer each question in one sentence or one word)

1. What is the effect of increase in temperature on the solubility of gas in a liquid?
2. Define osmotic pressure.
3. Mention the concentration of H⁺ ions in the solution used in S H E.
4. A plot of log of concentration of reactants against time is linear, with negative slope. Predict the order of reaction.
5. Give one example for homogenous catalysis.
6. Name the depressant used in separation of ZnS from PbS by froth flotation.
7. Name the noble gas which is not present in air.
8. Write the general equation for Finkelstein reaction.
9. Give reason: Acetic acid is soluble in water.
10. Identify the fat soluble vitamin among the following: Vitamin-B₁₂, Vitamin-C, Vitamin-D.

PART - B

II. Answer any FIVE of the following questions. (Each question carries 2 marks) 5 x 2 = 10

11. Give two differences between p-type and n-type semiconductors.
12. What is limiting molar conductivity? Represent graphically the variation in molar conductivity with concentration for acetic acid.
13. Rate constant of a first order reaction is $6.93 \times 10^{-3} \text{ min}^{-1}$. Calculate half life period.
14. (a) What is actinide contraction?
(b) Which is the most common oxidation state exhibited by actinides?
15. How do you prepare diethyl ether by dehydration of ethanol?
16. How do you convert benzamide to benzoic acid?
17. Give one example each for (a) Tranquilizer (b) Antiseptic.
18. Explain saponification, with an example.

PART - C

III. Answer any FIVE of the following questions. (Each question carries 3 marks) 5 x 3 = 15

19. How is copper refined by electrolytic method?
20. (a) Write the structure and mention basicity of hypo phosphorus acid.
(b) Name the gas liberated when zinc reacts with dilute HNO₃.
21. Draw the flow chart for the manufacture of sulphuric acid by contact process.
Name the catalyst used in the process.
22. (a) Give two reasons for the anomalous behavior of fluorine.
(b) Give one example of inter-halogen compound.
23. What are interstitial compounds? Write any two characteristics of interstitial compounds.

24. (a) Write two chemical equations to show the inter-conversion of chromates and dichromates in aqueous solution.
 (b) Complete the equation: $5 \text{C}_2\text{O}_4^{2-} + 2 \text{MnO}_4^- + 16 \text{H}^+ \rightarrow$
25. With the help of valence bond theory, account for the geometry and magnetic property of $[\text{Co}(\text{NH}_3)_6]^{3+}$.
26. (a) What is an ambidentate ligand? Name the type of isomerism that arises in coordination compound containing such a ligand.
 (b) Give the IUPAC name of $\text{K}_2[\text{Zn}(\text{OH})_4]$.

PART - D

IV. Answer any THREE of the following questions. (Each question carries 5 marks) 3 x 5 = 15

27. (a) Calculate the packing efficiency in a CCP crystal lattice.
 (b) What is the number of particles per unit cell of a simple cube? (4+1)
28. (a) Calculate the osmotic pressure of 0.05% urea solution in water at 20°C.
 Given $R=0.0821 \text{ L atm mol}^{-1} \text{ K}^{-1}$, Molar mass of urea = 60 g mol^{-1} .
 (b) Give two general characteristics of an ideal solution of two liquids. (3+2)
29. (a) Calculate the emf of the cell in which the following reaction takes place.
 $\text{Ni(s)} + 2 \text{Ag}^+(0.002\text{M}) \rightarrow \text{Ni}^{2+}(0.160\text{M}) + 2 \text{Ag(s)}$, given that $E^\circ_{\text{cell}} = 1.05\text{V}$
 (b) A galvanic cell after use is recharged by passing current through it.
 What type of cell is it? Give an example. (3+2)
30. (a) Rate constant of a reaction at 300K and 400K are 0.034 s^{-1} and 0.136 s^{-1} respectively. Calculate the activation energy for the reaction. [$R=8.314 \text{ J K}^{-1} \text{ mol}^{-1}$]
 (b) Derive the expression for half-life of zero order reaction. (3+2)
31. (a) Mention two applications of adsorption.
 (b) What are emulsions? Give one example for O/W emulsion.
 (c) What is the cause for Brownian movement? (2+2+1)

V. Answer any FOUR of the following questions. (Each question carries 5 marks) 4 x 5 = 20

32. (a) Explain $\text{S}_{\text{N}}2$ mechanism with an example.
 (b) Name the product formed when chloromethane reacts with (i) aqueous KOH (ii) alc. AgCN.
 (c) Give an example of polyhalogen compound. (2+2+1)
33. (a) Explain esterification reaction between acetic acid and ethyl alcohol as example.
 (b) What is the effect of $-\text{NO}_2$ group on the acidic strength of phenol? Give reasons.
 (c) Boiling point of alcohol is greater than the boiling point of hydrocarbon of comparable molar masses. Why? (2+1+2)
34. (a) Explain Etard's reaction.
 (b) Name the products A and B in the following reaction.
 $2 \text{CH}_3\text{CHO} \xrightarrow{\text{dil NaOH}} \text{A} \xrightarrow{\Delta} \text{B} + \text{H}_2\text{O}$
 (c) Name the reagent used in the decarboxylation of carboxylic acid. (2+2+1)
35. (a) How do you convert benzene diazonium chloride to chlorobenzene? Name the reaction.
 (b) Explain Hoffmann's bromamide reaction, with an example. (3+2)
36. (a) Write the Haworth's structure of maltose.
 (b) What are hormones? Give one biological function of insulin.
 (c) What are nucleosides? (2+2+1)
37. (a) Name the monomers of Nylon-6,6.
 (b) How is Neoprene prepared? Give equation.
 (c) Give an example for thermoplastic polymer. (2+2+1)
