SURANA IND. PU COLLEGE, BENGALURU – 04
II PUC CHEMISTRY MODEL QUESTION PAPER – 4

Time: 3 Hrs 15 Mins **Max. Marks: 70**

Instructions:
1. This question paper has four parts A, B, C and D. Answer all the parts.
2. Write balanced chemical equations and draw labeled diagrams wherever needed.
3. Use log tables and simple calculators if necessary.
   (Use of scientific calculators is not allowed)

PART - A

I: Answer ALL questions. Each question carries one mark. 10X1=10

1. Give an example of a liquid aerosol.
2. What happens to the solubility of a gas in a liquid with increase in temperature?
3. State Kohlrasch law.
4. Define rate constant of a reaction.
5. What happens to the entropy during the adsorption of a gas on a solid?
6. Name a metal that can be purified by Van Arkel method.
7. Write the structure of NO_2.
8. Mntion any one use of iodoform.
9. Write the IUPAC name of t-butyl bromide.
10. Name a basic amino acid.

PART - B

II: Answer any FIVE questions. Each question carries two marks. 5 x 2 = 10

11. Calculate the number of particles per unit cell in bcc.
12. Calculate the mass of copper deposited on cathode when a current of 1.5 A is passed through copper sulphate solution for 5 minutes. (Atomic mass of copper = 63.5)
13. Calculate the time required for 25% completion of a I order reaction whose rate constant is 0.0015 min^{-1}.
14. Explain: Potassium dichromate is orange red in acidic medium and yellow in basic medium.
15. Name the products formed when
(a) Ethanol is passed over copper heated to 573K.
(b) Methanol is heated with thionyl chloride in presence of pyridine.
Write the equations for the above reactions.
16. Give an example for Wolff-Kishner reduction. Write equation.
17. Write the Haworth's structure of β-D-glucopyranose.
18. Give one example each for (i) artificial sweetening agent and (ii) anti oxidant.

PART – C

III: Answer any FIVE questions. Each question carries three marks. 5 x 3 = 15

19. How is aluminium obtained from purified alumina?
20. Explain the manufacture of ammonia by Haber's process.
21. How does chlorine react with (i) excess of NH_3 (ii) $Ca(OH)_2$ and (iii) H_2S? Write equations.
22. Write the electronic configuration of Krypton. Why is it chemically inert?
Mention any one use of Argon.
23. What is lanthanide contraction? Explain its consequence.
24. With respect to 3d-series elements,
(i) Write the general electronic configuration
(ii) The element having oxidation states of +1 and +2 only
(iii) Element having highest number of oxidation states.
25. Explain the hybridization, geometry and magnetic property of $[Ni(CN)_4]^{2-}$ on the basis of Valence Bond Theory.
26. (a) Write the electronic configuration of Ti in $[Ti(H_2O)_6]^{3+}$ in octahedral crystal field.
(b) Write the IUPAC name of $[Co(NH_3)_5Cl]Cl_2$.
(c) Why tetrahedral complexes do not show geometrical isomerism?

PART – D

IV: Answer any THREE questions. Each question carries five marks. 5 x 3 = 15

27. (a) Calculate the packing efficiency of fcc crystal lattice.
(b) Explain F-centre, with a suitable example.
28. (a) 5% aqueous solution by mass of sucrose has a freezing point of 272.86K.
Calculate the molal depression constant of water.
(b) What is azeotropic mixture? Give an example.
29. (a) Derive an expression for the rate constant of a first order reaction.
(b) Define activation energy of a reaction. How is related to rate constant of reaction?
30. (a) Write a neat sketch diagram of $H_2 – O_2$ fuel cell.
Write the anode and cathode half cell reactions.
(b) Show that the time required for 99% completion of a first order reaction is twice the time required for 90% completion.
31. (a) How is gold sol prepared by Bredig's arc method?
(b) Define gold number. Mention its importance.

PART – E

V: Answer any FOUR questions. Each question carries five marks. 5 x 4 = 20

32. (a) Give an example of Wurtz-Fittig reaction.
(b) Why is chlorobenzene less reactive towards electrophilic substitution reactions?
(c) Write the IUPAC name of allyl bromide.
33. (a) How do you distinguish between primary, secondary and tertiary alcohols using Lucas reagent?

(b) What happens when benzene diazonium chloride is warmed with water?

34. (a) How benzaldehyde reacts with (i) HCN and (ii) NH_2OH? Write equations.
    (b) What is Etard's reaction? Give example.
35. (a) How is aniline obtained from (i) benzamide and (ii) nitrobenzene? Write equations.
    (b) Why methyl amine is more basic than ammonia?
36. (a) What are acidic, basic and neutral amino acids? Give one example for each.
    (b) Name a steroid hormone and mention its function.
37. (a) Write the names of monomers in (i) nylon-6,6 (ii) neoprene (iii) buna-N.
    (b) What are thermosetting polymers? Give an example.