

SURANA INDEPENDENT PU COLLEGE
MODEL QUESTION PAPER - I
II PU CHEMISTRY (34)

Duration: 3hours 15min

Max. Marks: 70

Instructions:

- a) The question paper has four parts A, B, C and D. All the parts are compulsory.
- b) Write balanced chemical equations and draw labelled diagrams wherever asked.
- c) Use log tables and simple calculator if necessary [Use of scientific calculator is not allowed]

PART – A

I. Answer ALL of the following:

[10 X 1 = 10]

1. Name the phenomenon involved, raw mango in a concentrated salt solution loses water and shrinks.
2. How does the volume change on mixing two volatile liquids to form an ideal solution?
3. State Faraday's law of electrolysis.
4. Define collision frequency
5. Enthalpy of physical adsorption is quite low: Give reason.
6. Give an example of a metal purified by Mond process.
7. Among Noble gases which one is most abundant in the atmospheric air?
8. Write the general equation for Wurtz reaction.
9. What is the reagent 'A' used in the following equation? $R-COOH \xrightarrow{A} R-CH_2OH$
10. Which vitamin deficiency causes the diseases pernicious anaemia?

PART – B

II. Answer any FIVE of the following:

[5 X 2 = 10]

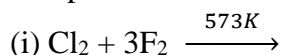
11. Mention the difference between crystalline and amorphous with respect to shape and melting point.
12. Write the cathodic and anodic reactions of Hydrogen-Oxygen fuel cell.
13. Rate constant of a first order reaction is $6.93 \times 10^{-3} \text{ min}^{-1}$. Calculate the half-life period of the reaction.
14. What is Lanthanoid contraction? Mention the cause for it.
15. Explain Kolbe's reaction.
16. How anisole reacts with acetyl chloride in the presence of anhydrous $AlCl_3$? Write the chemical equation for the reaction.
17. What is antifertility drug? Give an example.
18. Give an example for (i) Non-narcotic analgesics (ii) Antiseptics.

PART – C

III. Answer any FIVE of the following:

[5 X 3 = 15]

19. Explain the extraction of aluminium from purified alumina by Hall – Heroult's process.
20. Write the equations involved in the preparation of nitric acid by Ostwald's process by maintaining the reaction conditions
21. (a) How is ozonised oxygen in the laboratory? Give equation.
- (b) Give the composition of "Oleum".
22. (a) Complete the following equations:



[2+1]

- (b) Write the structure of chlorous acid.

[2+1]

23. Write the balanced equation in the manufacture of $K_2Cr_2O_7$ from chromite ore.
24. (a) Calculate the spin only magnetic moment of Fe^{2+} [Atomic number of iron is 26].
 (b) Which element of 3d series exhibits maximum oxidation state? [2+1]
25. Based on VBT explain the geometry and magnetic property of $[Co(NH_3)_6]^{3+}$
26. (a) Draw the structure of cis and trans isomers of $[CoCl_2(en)_2]$.
 (b) Write the IUPAC name of $[Co(NH_3)_4(H_2O)Cl]Cl_2$. [2+1]

PART – D

IV. Answer any THREE of the following: [3 X 5 = 15]

27. (a) Calculate the packing efficiency in face centred cubic lattice.
 (b) Silver crystallizes in fcc, if the edge length of the unit cell is 4.07×10^{-8} cm and density is 10.48 g cm^{-3} . Calculate the atomic mass of silver. ($N_A = 6.023 \times 10^{23}$). [3+2]
28. (a) On dissolving 2.34g of non-electrolyte solute in 40g of benzene, the boiling point of solution was higher than benzene by 0.81K. K_b value for benzene is $2.53 \text{ K kg mol}^{-1}$. Calculate the molar mass of solute. [Molar mass of benzene is 78 g mol^{-1}].
 (b) (i) State Henry's law.
 (ii) How solubility of a gas in liquid changes with increase in temperature? [3+2]
29. (a) Explain the construction and working of SHE
 (b) (i) State Kohlrausch law of independent migration of ions.
 (ii) Write the overall cell reaction in mercury cell. [3+2]
30. (a) Derive an integrated rate equation for the rate constant of first order reaction.
 (b) What is pseudo first order reaction? Give an example. [3+2]
31. (a) Write any two difference between lyophilic and lyophobic colloids.
 (b) What is Homogeneous catalysis? Give an example.
 (c) Give an expression for Freundlich adsorption isotherm. [2+2+1]

V. Answer any FOUR of the following: [4 X 5 = 20]

32. (a) Write the equation for the steps in SN^1 mechanism of the conversion of tert-butyl bromide into tert-butyl alcohol.
 (b) Explain Finkelstein reaction with an example. [3+2]
33. (a) Explain the mechanism of acid catalysed dehydration of ethanol to ethene.
 (b) i) Name the product obtained when benzoic acid is heated with ammonia
 ii) Name the reagent used in the Clemmensen reduction. [3+2]
34. (a) Explain the preparation of carboxylic acids from Grignard reagents? Write the general reaction
 (b) Write equations for:
 i) Gatterman – Koch reaction to convert benzene into benzaldehyde.
 ii) The formation of oxime from carbonyl compounds [3+2]
35. (a) How aniline is prepared by Hoffmann's bromamide reaction? Write equation.
 (b) Arrange the following amines in the order of their increasing basic strength in aqueous solution
 $(CH_3)_3N$, $(CH_3)_2NH$, CH_3NH_2 , NH_3
 (c) Write the IUPAC name $(CH_3)_3N$ [2+2+1]
36. (a) Write the Haworth's structure of sucrose.
 (b) What is a peptide linkage? How many peptide bonds are present in a tetra peptide?
 (c) Name the Hormone which regulates blood sugar level in the body. [2+2+1]
37. (a) How is Buna-N prepared? Give equation.
 (b) Name the monomers of Nylon-6, 6.

(c) Write the partial structure of Neoprene.

[2+2+1]

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