SURANA INDEPENDENT PU COLLEGE
MODEL QUESTION PAPER - II
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. What type of deviation from Raoult's law is expected on mixing equal volumes of acetone and ethanol?

2. Define isotonic solution.

3. How many Faradays of electricity is required to reduce 1 mole of MnO_4^- ions to Mn^{2+} ions?

4. Unit of rate constant of a reaction is the same as that of its rate. What is the order of this reaction?

5. Write the mathematical expression for Freundlich adsorption isotherm.

6. Give the composition of copper matte.

7. Complete the reaction, $2XeF_6 + 3H_2O \longrightarrow$ $+ 6HF$

8. Name the major product obtained when tertiary butyl bromide is heated with alcoholic KOH solution.

9. Formaldehyde undergoes Cannizzaro reaction: Give reason.

10. Which Vitamin deficiency causes the disease 'Rickets'?

PART – B

II. Answer any FIVE of the following: **[5 X 2 = 10]**

11. Calculate the number of particles per unit cell in a FCC crystal lattice.

12. Name the gases liberated at anode and cathode respectively when an aqueous solution of sodium chloride is electrolysed using graphite anode and iron cathode.

13. Show that half life period for a first order reaction is independent to initial concentration.

14. Write the differences between lanthanoids and actinoids.

15. Name the organic compound obtained when vapours of tertiary butyl alcohol is passed over heated copper at 573K write the equation.

16. Explain Clemmensen's reduction with an example.

17. What are food preservatives? Give an example.

18. Give an example each for (i) an antacid   (ii) antiseptic

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. For the manufacture of ammonia by Haber's process, write the flow chart and chemical equation with suitable condition.

21. (a) How is Ozonised oxygen prepared in the laboratory? Give equation.

    (b) Give the structure of sulphurous acid (H_2SO_3).   [2+1]

22. (a) Write any two reasons for anomalous behaviour of fluorine.

    (b) What is aquaregia?   [2+1]

23. How Potassium permanganate is prepared from Pyrolusite ore.

24. (a) Calculate the spin only magnetic moment of Ti^{3+} ion (atomic number of Ti = 22)
    (b) Cu^{2+} salt solutions are coloured: Give reason.   [2+1]

25. Based on VBT explain the geometry and magnetic property of $[CoF_6]^{3+}$.

26. (a) Write any two postulates of Werner's theory of co-ordination compound.
    (b) Write the IUPAC name of $[Pt(NH_3)_3(H_2O)_2Cl]$.   [2+1]

PART – D

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

27. (a) Calculate the packing efficiency in a body centred cubic lattice.
    (b) What are ferromagnetic substances? Write an example.   [3+2]

28. (a) A solution containing 1.2 g of an organic solute in 50g of CCl_4 boils at 350.5K under atmospheric
        pressure. Calculate the molecular mass of the solute. (Given: Boiling point of CCl_4 less than one
        atmosphere is 350K; Molal elevation constant for CCl_4 is $K_b = 5.0$ K kg mol^{-1})
    (b) Write any two differences between ideal and non ideal solution.   [3+2]

29. (a) Calculate the ΔG^O at 25^{0}C for the following electrochemical
            Cu | Cu^{2+}(1M) || Ag^+(1M) | Ag
        Given that: $E^0_{Cu} = + 0.34V$, $E^0_{Ag} = +0.8V$. (F = 96500C)
    (b) State Kohlrausch law. Write its one application.   [3+2]

30. (a) Derive an integrated rate equation for the rate constant of zero order reaction.
    (b) The rate constant of a reaction doubles when the temperature increases from 300K to
        310K. Calculate the energy of activation. (R = 8.314 J/K/mol   [3+2]

31. (a) Mention the difference between physisorption and chemisorptions
    (b) What is shape selective catalysis? Give an example   [3+2]

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 Wurtz-Fittig reaction with an example.   [3+2]

33. (a) Explain the Kolbe's reaction with equation.
    (b) How is phenol manufactured from cumene?
    (c) What is the effect of electron withdrawing group on acidity of phenols?   [2+2+1]

34. (a) Write equation for the
        (i) Formation of oxime from acetone
        (ii) Reaction between acetic acid and PCl_5
        (iii) Reaction between formaldehyde and conc. NaOH
    (b) Explain HVZ(Hell-Volhard-Zelinsky) reaction with equation.   [3+2]

35. (a) How is methanamine prepared by Hoffmann bromamide reaction? Give equation..
    (b) Name the major product formed when nitrous acid is treated with
        (i) Ethylamine
        (ii) Aniline at low temperature
    (c) Why primary amine have higher boiling point than tertiary amines?   [2+2+1]

36. (a) Write the Haworth's structure of maltose.
    (b) How do you show that glucose contains a linear chain of six carbon atoms?
    (c) Name the pentose sugar present in DNA.   [2+2+1]

37. (a) How is Buna-S prepared? Give equation.
    (b) What is biodegradable polymer? Write an example.
    (c) What is thermoplastic?   [2+2+1]