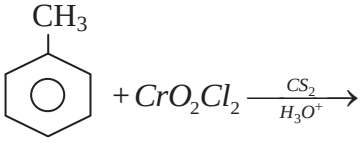
SRI BHAGAWAN MAHAVEER JAIN COLLEGE Vishweshwarapuram, Bangalore. **Mock Question Paper 2** – January 2020	**Course:** II year PUC **Subject:** Chemistry **Max. Marks:** 70 **Duration:** 3:15hrs

INSTRUCTIONS: DO NOT write or mark anything on the question paper.
A. The Question paper has Five Parts, A, B C, D_4 & D_5.
B. Write balanced chemical equation and draw neat labelled diagram wherever necessary.
C. R = 8.314 $JK^{-1}mol^{-1}$, At. Number: Ni-28, Co-27, Mn-25

PART-A

I. Answer all the following: **10 x 1 = 10**

1. What are isotonic solutions?
2. At a given temperature and pressure, N_2 gas is more soluble than He gas in water. Which of them has higher value of K_H?
3. What is the SI unit of molar conductivity?
4. Give an example for pseudo first order reaction.
5. Out of Na^+, Mg^{2+} and Al^{3+}, which ion is needed in lower concentration to coagulate As_2S_3 sol?
6. Give the composition of copper matte.
7. Among Cr^{2+} and Mn^{3+}, which ion acts as reducing agent?
8. Why boiling point of ethyl bromide is higher than ethyl chloride?
9. Complete the following reaction:



10. Name the base that is present in RNA but not in DNA.

PART-B

II. Answer any FIVE of the following: **5 x 2 = 10**

11. Mention any two differences between n-type and p-type semiconductors.
12. Write Nernst equation for single electrode potential. Explain the terms involved.
13. What happens to half life of a first order reaction when temperature is increased? Give reason.
14. Transition elements are good catalyst. Give reason.
15. Explain Williamson's ether synthesis using a suitable example.
16. How do you convert propene to propan – 2 – ol? Give equation.
17. What are tranquilisers? Give an example.
18. What are food preservatives? Give an example.

PART-C

III. Answer any FIVE of the following: **5 x 3 = 15**

19. Explain the extraction of aluminum by Hall-Heroult's process with a neat labelled diagram **(3)**
20. Arrange NH_3, PH_3, AsH_3, SbH_3 & BiH_3 as directed.
    (i) Increasing order of their basic strength
    (ii) Decreasing order of their thermal stability
    (iii) Decreasing order of their reducing character. **(1+1+1)**
21. Complete the following reaction.
    (i) $C_{12}H_{22}O_{11} \xrightarrow{Conc, H_2SO_4}$
    (ii) $2KClO_3 \xrightarrow[\Delta]{MnO_2}$
    (iii) $SO_3^{2-} + 2H^+ \rightarrow$ **(1+1+1)**
22. a) How is chlorine manufactured by Deacon's process?
    b) Name the main commercial source of helium. **(2+1)**

23. a) Zero spin magnetic moment in its +1 and +2 oxidation state.
b) Name the metal of first row transition series that has highest value of magnetic moment. **(2+1)**

24. a) Write any two difference between lanthanoids and actinoids.
b) What is the product formed when lanthanoid reacts with nitrogen gas? **(2+1)**

25. Explain the hybridisation, geometry and magnetic property of $[Ni(CN)_4]^{-2}$. **(3)**
26. Explain crystal field splitting in tetrahedral complex. **(3)**

PART-D_4

IV. Answer any THREE of the following: **3 x 5 = 15**

27. a) Calculate the packing efficiency in fcc unit cell.
b) Cu crystalises in a fcc unit cell having the edge length 3.608×10^{-8}cm and density of 8.92 g/cm^3. Calculate the atomic mass of Cu. ($N_A = 6.022 \times 10^{23}$). **(3+2)**

28. (a) 200 cm^3 of an aqueous solution of protein containing 1.26g of protein. The osmotic pressure of such a solution at 300K is found to be 2.57×10^{-3} bar. Calculate the molar mass of protein. ($R = 0.0831L$ bar $mol^{-1}K^{-1}$).
(b) If the solubility of H_2S in water at 0.987 bar is 0.195m, calculate Henry's law constant. (At. mass of H=1.O=16) **(3+2)**

29. (a) Explain the mechanism of rusting of iron. Write the half-cell reactions.
(b) What are fuel cells? Give an example. **(3+2)**

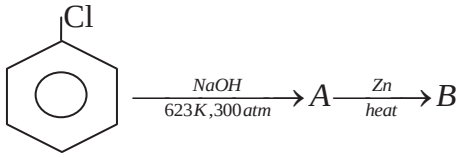
30. (a) Derive the integrated rate equation for velocity constant of zero order reaction.
(b) Define: i) Collision frequency ii) Activation energy.
(c) Rate constant for a reaction is $1.6\times10^{-2}\,s^{-1}$. What is the order of the reaction? **(2+2+1)**

31. (a) Mention any two application of colloids.
(b) Explain dialysis.
(c) Name the phenomenon in which colloidal particles move in zig-zag motion. **(2+2+1)**

PART-D_5

V. Answer any Four of the following. **4x5=20**

32. (a) Give the balanced chemical equations for the following conversions.
(i) bromo ethane to iodoethane.
(ii) Benzene diazonium chloride to chloro benzene.
(iii) Chloromethane to ethane.
(b) Identify A and B in the following reaction



(3+2)

33. (a) Explain the mechanism of acid catalyzed conversion of ethanol to ethene.
(b) How is salicylic acid converted to aspirin? Give equation. **(3+2)**

34. (a) Explain Cannizzaro's reaction using an example.
(b) Explain HVZ reaction using a suitable example.
(c) Give the IUPAC name of the following compound $CH_3CH=CHCHO$ **(2+2+1)**

35. (a) How is 1^0 amine prepared by Gabriel's phthalimide synthesis?
(b) Write equation for the conversion of p-amino azobenzene from benzene diazonium chloride. Name the reaction.
(c) What is Hinsberg reagent? **(2+2+1)**

36. (a) How do you show that glucose contains aldehydic group? Give equation.
(b) Write the Haworth structure of β-D-(-) fructose.
(c) Name the protein present in hair. **(2+2+1)**

37. (a) Write the partial structure of Neoprene, Dacron and Nylon-6
(b) What is vulcunisation of rubber?
(c) Mention one use of bakelite. **(3+1+1)**

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