



**Instruction: DO NOT write or mark anything on the question paper.**

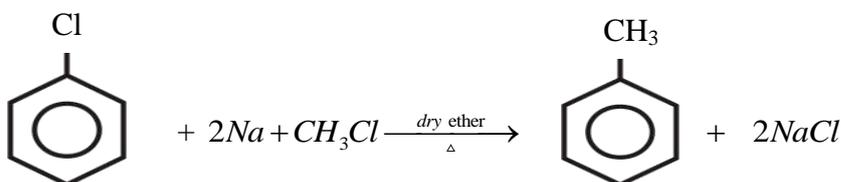
- A. The Question paper has Five Parts, A, B, C, D4 & D5.**  
**B. Write balanced chemical equation and draw neat labeled diagram where ever necessary.**  
**C. R=8.314 JK<sup>-1</sup>mol<sup>-1</sup>, At. Number: Ni-28, Co-27, Mn-25**

### PART-A

**I. Answer all of the following.**

**10x1=10**

1. What is the SI unit of molal elevation constant of a solvent?
2. What happens if pressure greater than osmotic pressure is applied on the solution separated by semipermeable membrane from the solvent?
3. Two metals A and B have reduction potential values -0.76V and +0.34V respectively. Which of these will liberate hydrogen gas from dilute sulphuric acid?
4. Define collision frequency.
5. Give an example of shape selective catalyst.
6. Name the method used to refine nickel.
7. Draw the structural formula of XeF<sub>4</sub>.
- 8.



Name the reaction.

9. Electron withdrawing group increases the acidic strength of carboxylic acid. Give reason.
10. What is glycosidic linkage?

### PART-B

**II. Answer any five of the following.**

**5x2=10**

11. Explain p-type semiconductor with suitable example.
12. What mass of copper is deposited at cathode when 2A of current is passed through CuSO<sub>4</sub> solution for one hour? (At. mass of Cu = 63.5, 1F = 96,500C)
13. Given  $2NO_{(g)} + O_{2(g)} \rightarrow 2NO_{2(g)}$ ; rate =  $k[NO]^2[O_2]^1$ . By how many times does the rate of reaction change when concentration of NO is doubled?
14. Write the general electronic configuration of f-block elements. Actinoid contraction is greater than lanthanide contraction. Give reason.
15. Explain Friedel-craft's alkylation of anisole.
16. How is acetone prepared by methyl magnesium chloride?
17. What are tranquilizers? Give an example.
18. Give an example of anionic and cationic detergents.

### PART-C

**III. Answer any five of the following.**

**5x3=15**

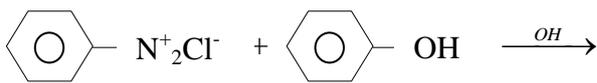
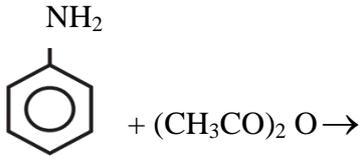
19. How is gold extracted by cyanide process? Write equations. (3)
20. Which allotropic form of phosphorus has discrete tetrahedral P<sub>4</sub> molecules? How is phosphine prepared in laboratory? Give equations. (3)
21. (a) SO<sub>2</sub> decolorizes KMnO<sub>4</sub> solution. Give the reaction.  
(b) sketch the structures of (i) Pyrophosphoric acid (ii) peroxodisulphuric acid. (1+2)
22. (a) Give 2 reasons for anomalous behaviour of fluorine.  
(b) Give the structure of HOClO<sub>2</sub>. (2+1)

23. Give reasons for the following  
 (i) Transition elements and their compounds can act as good catalyst.  
 (ii) Most of the transition metals have high melting point and boiling point. (2+1)
24. Write balanced chemical equation when  $K_2Cr_2O_7$  reacts with (i) KI (ii)  $H_2S$  (iii)  $FeSO_4$ . (3)
25. On the basis of VBT, explain the hybridisation, geometry and magnetic property of  $[CoF_6]^{3-}$ . (3)
26. Mention any 3 postulates of Werner's theory. (3)

**PART-D<sub>4</sub>****IV. Answer any 3 of the following.****3x5=15**

27. (a) Calculate the packing efficiency in hcp.  
 (b) What are paramagnetic substances? Give an example. (3+2)
28. (a) The boiling point of benzene is 353.23K. When 1.8g of a non-volatile solute was dissolved in 90g of benzene, the boiling point is raised to 354.11K. Calculate the molar mass of solute.  
 (b) Calculate the mole fraction of benzene in solution containing 30% by mass in  $CCl_4$ . (3+2)
29. (a) Find the value of  $\Delta G^0$  at  $25^0C$  for the following electrochemical cell,  
 $Cu_{[s]}/Cu^{2+}(1M)//Ag^+(1M)/Ag_{(s)}$  ( $E^0_{Cu^{2+}/Cu} = +0.34V$  and  $E^0_{Ag^+/Ag} = +0.8V$ ).  
 (b) Give reason for the following.  
 (i) Copper displaces silver from silver nitrate solution.  
 (ii) Iron pipes are usually coated with zinc.  
 (c) What is the role of  $ZnCl_2$  in dry cell? (2+2+1)
30. (a) A certain first order reaction is half completed in 46min. Calculate the rate constant and also time taken for 75% completion of the reaction.  
 (b) Derive an integrated rate equation for a zero order reaction. (3+2)
31. (a) Explain electrical disintegration method for the preparation of gold sol using a neat labelled diagram.  
 (b) Write the equation for two steps involved in enzyme catalysis. (3+2)

**PART-D<sub>5</sub>****V. Answer any four of the following.****4x5=20**

32. (a) Write the IUPAC name of major product obtained when 2-bromo pentane is heated with alcoholic KOH. Give equation. Name the rule which governs this reaction.  
 (b) Complete the following reaction.  
 (i)  $CH_3OH + SOCl_2 \xrightarrow{Pyridine} \text{---} + \text{---} + \text{---}$   
 (ii)  $C_2H_5Cl + AgCN_{(alc)} \xrightarrow{\Delta} \text{---} + \text{---}$  (3+2)
33. (a) Explain the mechanism of acid catalyzed dehydration of ethanol.  
 (b) How is phenol manufactured from chlorobenzene? (3+2)
34. (a) Benzaldehyde is treated with Conc. NaOH. Write the equation for the reaction. Name the reaction and the products formed.  
 (b) How do you convert phthalic acid to phthalimide? Give equation. (3+2)
35. (a) Identify the major product formed in the following reactions.  
 (i)   
 (ii)   
 (b) Explain carbylamine reaction using a suitable example.  
 (c) Give the IUPAC name of  $(CH_3)_3N$ . (2+2+1)
36. (a) Write the Haworth structure of non-reducing disaccharide.  
 (b) Give an example of fat soluble vitamin and the disease caused due to its deficiency  
 (c) Which structure of protein remains intact during denaturation of protein? (2+2+1)
37. (a) What are thermoplastic? Name the monomer of nylon-6.  
 (b) Name the type of attractive forces present in (i) Elastomers (ii) Fibrous polymer  
 (c) Give an example of biodegradable synthetic polymer. (2+2+1)