PART-A

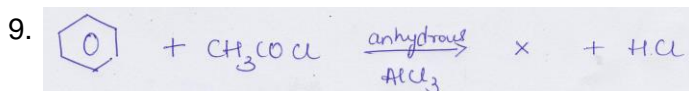**Answer the following question**   [10×1=10]

1. Name a colligative property

2. Name any one concentration term which is independent of temperature.

3. State Faraday's first law of electrolysis

4. What is collision frequency?

5. What is heterogeneous catalysis?

6. Metals having low melting point are refined by _____

7. Noble gases have very low boiling point. Why?

8. A racemic mixture is optically inactive. Why?

9.

Write the structure of X in the above reaction?

10. Glucose on oxidation with bromine water gives gluconic acid. What does this reaction indicate about the structure of glucose?

PART B

Answer any five of the following question.   [5×2=10]

11. Name any two crystal systems.

12. State Kohlrausch law of independent migration of ions.

13. Write Arrhenius equation. What is E_a in the equation called?

14. Give reason.a) Most of the transition metals have high melting and boiling point.

b) Second ionizing enthalpy of copper is exceptionally high.

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

16. Give the equation for the reaction between benzaldehyde and acetophenone in the presence of dilute alkali. What type of condensation reaction is this?

17. What are analgesics? Give an example.

18. What are antifertility drug? Give an example.

PART C

Answer any five of the following question   [5×3=15]

19. a) Name the reducing agent used in the extraction of zinc from zinc oxide. Give the equation.
    b) What is the principle involved in zone refining of metals.   [2+1]
20. Describe with equation the manufacture of nitric acid by Ostwald's process.
21. Mention three anomalous behavior of Oxygen.
22. Complete the following equation ,

i) $2 KClO_3 \xrightarrow[\text{heat}]{MnO_2}$

ii) $SO_2 (g) + Cl_2 (g) \longrightarrow$

iii) $SO_3 + con/. H_2SO_4 \longrightarrow$
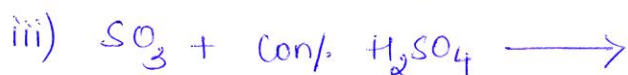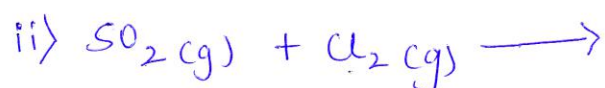
23. Give reason , a) Transition metals exhibits higher enthalpies of automisation.
b) Cr^{2+} is a strong reducing agent than Fe^{2+}
c) The highest oxidation state is exhibited by oxoanions of the metal.
24. How is potassium permanganate is prepared? Give equations.
25. Give differences between $[NiCl_4]^{2-}$ and $[Ni(CN)_4]^{2-}$ with respect to type of hybridization , magnetic behavior and geometry.
26. What is crystal field splitting? Write the energy level diagram for splitting in octahedral complex.

PART- D

Answer any three of the following question   **(3×5=15)**

27. a) Calculate the packing efficiency in cubic closed packing (ccp) lattice.
   (b) Mention the most disordered and ordered crystal system.   [3+2]
28. a) The vapour pressure of pure benzene at a certain temperature is 0.850 bar. When 0.5g of a non volatile solute is added to 39.0g of benzene (molar mass of benzene 78g/mol), vapour pressure of the solution is 0.145bar. what is the molar mass of nonvolatile solute?
b) State Raoult's law for a solution of two volatile liquids. Give an example for liquid mixture that shows negative deviation from Raoult's law.   [3+2]
29. a) Calculate the equilibrium constant of the reaction at 298K.

a) $Mg (s) + 2 Ag^+ (aq) \longrightarrow Mg^{2+} (aq) + 2 Ag (s) \quad E^o_{cell} = +3.16V$
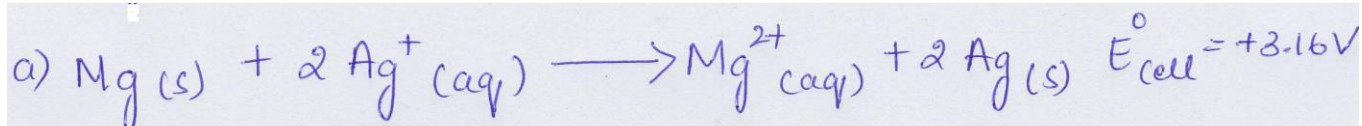
b) How is molar conductivity related to the conductivity of a solution? Which one of this as higher molar conductivity:0.1MKCl or 0.01M KCl?   [3+2]
30.a) Show that in case of first order reaction, the time taken for completion of 99.9% reaction is 10 times the time required for half change of the reaction.
b) What is zero order reaction? Give an example.   [3+2]
31. a) Explain electro dialysis for the purification of colloid.
b) Define shape selective catalysis? Give an example.
c) What happens to entropy when a gas is adsorbed on a solid?   [2+2+1]
V) **Answer any four of the following question**
   [4×5=20]
32. a) Give one example to the following reactions: (i) Finkelstein reaction
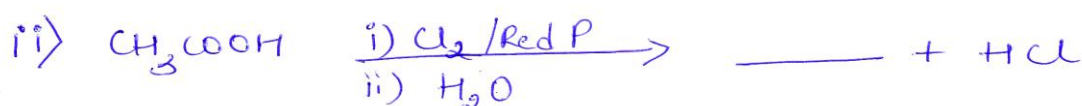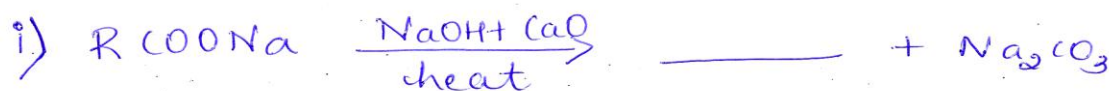   (ii) Wurtz reaction   (iii) Sandmeyer reaction
   b) What are diastereomers? Give an example.   [3+2]
33. a) Arrange water, ethanol and phenol in increasing order of acidity and give reason.
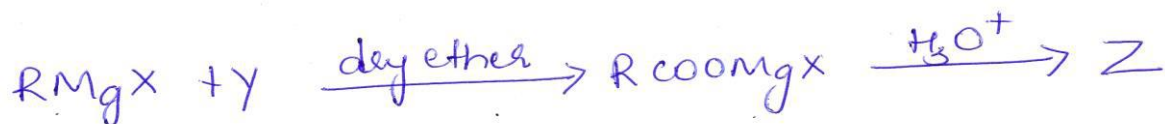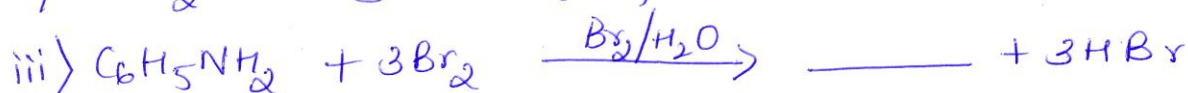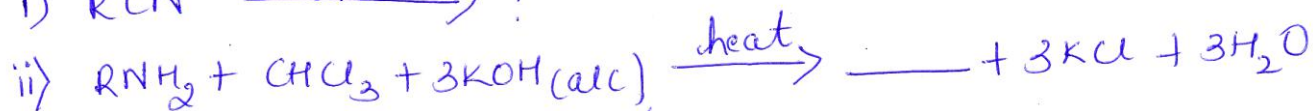   b) Complete the following reaction   [3+2]

i) $R\,COONa \xrightarrow[\text{heat}]{NaOH + CaO} \underline{\qquad} + Na_2CO_3$

ii) $CH_3COOH \xrightarrow[\text{ii) } H_2O]{\text{i) } Cl_2 / Red\ P} \underline{\qquad} + HCl$

34. a) Explain the mechanism of addition of HCN to aldehydes in presence of base.

b) What are Y and Z in the following reaction.   [3+2]

$$RMgX + Y \xrightarrow{\text{dry ether}} R\,coomgx \xrightarrow{H_3O^+} Z$$

35. a) Complete the following reaction

i) $RCN \xrightarrow{H_2/Ni}$?

ii) $RNH_2 + CHCl_3 + 3KOH(alc) \xrightarrow{heat} \underline{\quad\quad} + 3KCl + 3H_2O$

iii) $C_6H_5NH_2 + 3Br_2 \xrightarrow{Br_2/H_2O} \underline{\quad\quad} + 3HBr$

b) Explain clemmensen's reduction with an example.   [3+2]

36. a) Write Haworth's structure of lactose.

b) Define denaturation. Mention its effects on structure of proteins.

c) Write the zwitter ion structure of alanine.   [2+2+1]

37. a) What is copolymerization? Give an example with equation.

b) Write the name of the monomers for the polymer

i) Bakelite   ii) Natural rubber   [3+2]

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