Higher Secondary Second Year Examination

Maximum Score – 60
Time: 2 hours

Part-III

CHEMISTRY

Answer any four questions from 1 to 5 (each questions carries 1 score)

1. ----------percentage saline solution is isotonic with blood.
2. Name the element whose coordination compound effectively inhibit the growth of tumors.
3. Phenol when treated with con. HNO_3 in the presence of Con.H_2SO_4 give --------.
   a. o-nitrophenol b. p-nitrophenol c. mixture of a and b d. picric acid.
4. Among the following which one is chlorine containing insecticide
   a. DDT b. Freon c. Phosgene d. Iodoform
5. The maximum oxidation state shown by Mn in its compound is
   a. +8 b. +5 c. +6 d. +7

Answer any eight questions from 6 to 15 (each questions carries 2 scores)

6. State Henry's law and give any one application.
7. Write the name of four important colligative properties
8. Write the anode and cathode reactions occur in fuel cell
9. Write Arrhenius equation and explain the terms involved in it
10. What is Lanthanoid contraction. Write any one consequence of Lanthanoid contraction
11. Write down IUPAC name of the following compounds
    a. $[Co(NH_3)_5Cl]Cl_2$ b. $K_4[Mn(CN)_6]$ (2x1=2)
12. Haloalkanes and Haloarenes are compounds containing halogen atom. They undergo many types of reaction.
    a. $CH_3CH_2CH_2Cl \xrightarrow{\text{alc.KOH}} A$
    b. $CH_3CH_2CH_2Cl \xrightarrow{\text{aq. KOH}} B$ find A and B (2x1=2)
13. Illustrate Friedel Craft's acylation reaction.
14. How will you convert Aniline to Phenol.
15. What is denaturation of Protein. Give an example.

Answer any eight questions from 16 to 26 (each questions carries 3 scores)

16. a) What are the two important properties of ideal solution? (1)

    b) $200cm^3$ of an aqueous solution of protein contains 1.26 g of protein. The osmotic pressure of such solution at 300 K is found to be 2.57×10^{-3}. Calculate the molar mass of protein. (2)

17. a) State Kohlrausch's law. (1)

b) Conductivity of 0.00241M acetic acid is 7.896×10^{-5} S cm^{-1}. Calculate its molar conductivity. If ^° for acetic acid is 390.5 Scm^2 mol^{-1}. What is its dissociation constant? (2)

18. a) The rate constant of a reaction is 1.2×10^{-5} $mol^{-1}Ls^{-1}$. Predict its order (1)

b) Differentiate between order and molecularity. (2)

19. a) Which is an example for ambidentate ligand. (1)

i) Cl. ii) H_2O iii) NH_3 iv) CN

b) Draw the diagram to show splitting of d orbitals in octahedral crystal field (2)

20. Write the product of the following reaction. Also name the reactions. (2x1.5=3)

$C_6H_5Cl + CH_3Cl + 2Na$ ---dry ether---→

$2\ C_6H_5Cl + 2Na$ ----dry ether------ →

21. Write the chemical equations for the following preparation

a) Ethoxy ethane by Williamson synthesis (2)

b) Salicylic acid by Kolbe's reaction (1)

22. Illustrate the following reactions (2x1.5=3)

a) HVZ reaction

b) Cannizzaro reaction

23. How do you distinguish primary secondary and tertiary amines from each other (3)

24. a) Name the disaccharide which gives glucose units on hydrolysis (1)

b) Name the linkages found in the following biomolecules

i) protein (1)

ii) polysaccharides (1)

25. a) Among the following select the one which answers iodoform test

i) CH_3COCH_3

ii) $CH_3CH_2COCH_2CH_3$

b) Complete the following reactions (2x1.5=3)

i) $CH_3CHO + H_2N\text{-}NH_2$ -------- →

ii) CH_3CHO ------ Zn-Hg/HCl--→

26. a) Draw the structure of dichromate ion (1)

b) Write the different steps involved in the preparation of $KMnO_4$. (2)

Answer any four questions from 27 to 31 (each question carries 4 scores)

27. a) Give an example for Pseudo first order reaction. (1)

b) The rate of a reaction quadruples when the temperature changes from 293K to 313K. Calculate the energy of activation of the reaction assuming that it doesn't change with temperature. (3)

28. List variables types of isomerism possible for coordination compounds giving one example for each.

29. Complete the following reactions.

a. C_6H_5OH --------dil. HNO_3---→

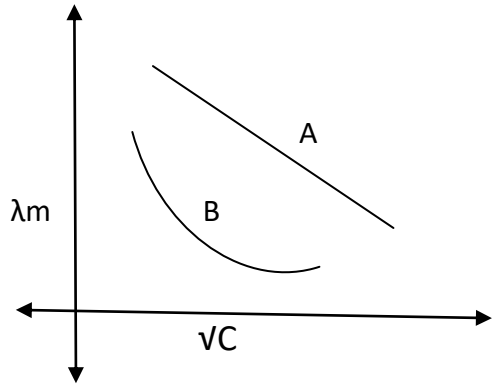
b. C_6H_5OH ------ $CHCl_3$/NaOH--→

c. $CH_3CH_2OH + SOCl_2$ ----pyridine ---→

d. C_6H_5OH -----bromine water---→ (4x1=4)

30. The following is a plot of Molar conductivity of electrolytes A and B against square root of concentration.

a. Identify the curves represented by A and B. (1)



b. Write the name of the half cell represented by (1)
$Pt_{(s)}/H_{2(g)})/H^+_{(aq)}$

c. Write any two differences between primary and secondary cell. (2)

31. a). Name the following reactions

i). $C_6H_5CH_3$ ------CrO_2Cl_2/hydrolysis--- → C_6H_5CHO

ii). C_6H_6 ---------CO and $HCl/AlCl_3$ or CuCl-----→ C_6H_5CHO (2x1=2)

b). Explain the following reactions.

i) Stephen reaction

ii) Rosenmund reduction reaction (2x1=2)

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