

**DELHI PUBLIC SCHOOL, JAMMU.**

**Assignment  
Pre-board –I(2018-2019)**

**Sub: Chemistry  
Class-XII**

**Section-A**

**( 1 mark)**

1. Define activation energy.
2. CO (g) and H<sub>2</sub> (g) react to give different products in the presence of different catalyst. Which ability of the catalyst is shown by these reactions?
3. Why is copper matte put in silica lined converter?
4. Write the coordination number and oxidation state of Platinum in the complex [Pt (en)<sub>2</sub>Cl<sub>2</sub>].
5. Out of chlorobenzene and benzyl chloride, which one gets easily hydrolysed by aqueous NaOH and why?
6. Why is aniline acylated before its nitration?
7. Define glycosidic linkage?
8. Why are rubbers called elastomers?
9. What is tincture of iodine?

**Section –B**

**(2 mark)**

1. Write the structure of an isomer of compound C<sub>4</sub>H<sub>9</sub>Br which is most reactive towards S<sub>N</sub>1 reaction.
2. Write the state of hybridization, shape and IUPAC name of the complex [CoF<sub>6</sub>]<sup>3-</sup>. (Atomic no. of Co =27)
3. Describe the role of the following:
  - i) CO in the purification of Nickel.
  - ii) NaCN in the froth floatation process.
4. Define the following terms:
  - i) Aerosol
  - ii) Coagulation of colloids
5. A first order reaction takes 40 min for 30% decomposition. Calculate (t<sub>1/2</sub>) for this reaction. (Given, log 1.428 = 0.1548)
6. The edge of the face centred cubic unit cell of aluminium is 404 pm. Calculate the radius of aluminium atom.
7.
  - i) What changes occurs when AgCl is doped with CdCl<sub>2</sub>?
  - ii) What type of semiconductor is produced when silicon is doped with boron?
8.
  - a) Why is Bithional added to soap?
  - b) Give the composition of Dettol.
9. Arrange the following polymers in increasing order of their intermolecular forces.
  - i) Nylon6,6 , Buna-S , polythene
  - ii) Nylon6, neoprene, PVC
10. Give a broad classification of vitamins?
11. How can you convert an amide into amine having one carbon less than the starting compound? Name the reaction.

**Section - C**

**(3 mark)**

1. An element X (molar mass = 60 g mol<sup>-1</sup>) has a density of 6.23 g cm<sup>-3</sup>. Identify the type of cubic unit cell, if the edge length of the unit cell is 4 × 10<sup>-8</sup>cm.
2. Calculate the freezing point of a solution containing 18 g of glucose, C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> and 68.4 g of sucrose, C<sub>12</sub>H<sub>22</sub>O<sub>11</sub> in 200g of water. The freezing point of pure water is 273K and K<sub>f</sub> for water is 1.86 K kg mol<sup>-1</sup>.
3. The value of  $\Lambda_m^0$  of Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> is 858 S cm<sup>2</sup> mol<sup>-1</sup>, while  $\lambda^0$  (SO<sub>4</sub><sup>2-</sup>) is 160 Scm<sup>2</sup> mol<sup>-1</sup>. Calculate the limiting ionic conductivity of Al<sup>3+</sup>.
4. A first order reaction is 50% completed in 40 minutes at 300K and in 20 minutes at 320 K. Calculate the activation energy of the reaction. (Given: log 2 =0.3010, log 4 = 0.6021, R =8.314 JK<sup>-1</sup> mol<sup>-1</sup>).

5. What happens when?
  - i) A freshly prepared precipitate of  $\text{Fe}(\text{OH})_3$  is shaken with a small amount of  $\text{FeCl}_3$  solution?
  - ii) Persistent dialysis of a colloidal solution is carried out?
  - iii) An emulsion is centrifuged?
6. Write the chemical reactions involved in the process of extraction of Gold. Explain the role of dilute  $\text{NaCN}$  and  $\text{Zn}$  in this process.
7. i) Write the formula of the following coordination compound:  
Iron (III) hexacyanoferrate (II)
  - ii) What type of isomerism is exhibited by the complex  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{SO}_4$ ?
  - iii) Why low spin tetrahedral complexes are rarely observed?
8. i) Write the structure of the product when chlorobenzene is treated with methyl chloride in the presence of sodium metal and dry ether.
  - ii) Write the structure of alkene formed by dehydrohalogenation of 1-bromo-1-methylcyclohexane with alcoholic  $\text{KOH}$ .
9. Explain the following with an example for each:
  - i) Kolbe's reaction
  - ii) Reimer-Tiemann reaction
  - iii) Williamson ether synthesis
10. a) State the following laws:
  - i) Faraday's first law of electrolysis
  - ii) Kohlrausch's law of independent migration of ions.
 b) Define fuel cell.
11. With the help of suitable diagrams, on the basis of band theory, explain the difference between
  - i) A conductor and an insulator
  - ii) A conductor and a semiconductor.
12. Give one chemical test to distinguish between the following pairs of compounds.
  - i) Methylamine and dimethylamine
  - ii) Ethylamine and aniline
  - iii) Aniline and benzyl amine
13. Give a short note on zwitter ion.
14. Draw the structures of the monomers of the following polymers:
  - i) Polythene
  - ii) PVC
  - iii) Teflon
15. What are the following substances, give one example each.
  - i) Tranquilizers
  - ii) Food preservatives
  - iii) Antihistamines.

**Section- D (5 mark)**

1. A decimolar solution of potassium ferrocyanide,  $\text{K}_4[\text{Fe}(\text{CN})_6]$  is 50% dissociated at 300K. Calculate the value of van't Hoff factor for potassium ferrocyanide. Also Calculate the osmotic pressure of solution at 300K.
2. i) Define the following terms:
  - a) Azeotrope
  - b) Osmotic pressure
  - c) Colligative properties
 ii) Calculate the mass of a non-volatile solute (molar mass =  $40\text{g mol}^{-1}$ ), which should be dissolved in 114 g of octane to reduce its vapour pressure to 80%. (Molar mass of octane =  $114\text{g mol}^{-1}$ ).
3. a) Define the term molar conductivity. How is it related to conductivity of the related solution?
  - b) Explain with examples the terms: weak and strong electrolytes.

4. a) Calculate e.m.f and  $\Delta G$  for the following cell  $\text{Mg(s)}/\text{Mg}^{2+} (0.001\text{M})//\text{Cu}^{2+} (0.0001\text{M})/\text{Cu(s)}$   
 $E^0_{(\text{Mg}^{2+}/\text{Mg})} = -2.37 \text{ V}, E^0_{(\text{Cu}^{2+}/\text{Cu})} = +0.34\text{V}.$

b) Write the name of the cell which is generally used in inverters. Write the reactions taking place at the anode and cathode of this cell.

5. Give reasons:

- i) n- butyl bromide has higher boiling point than t- butyl bromide.
- ii) Racemic mixture is optically inactive
- iii) The presence of nitro group ( $-\text{NO}_2$ ) at o/p positions increases the reactivity of haloarenes towards Nucleophilic substitution reactions.
- iv) What are ambident nucleophiles? Give an example.