CBSE Sample Paper Class 12 Chemistry Set 6

Section I: Each question carriers 1 mark: **1 x 6 = 6 marks**

1. Why is ferric chloride preferred over potassium chloride in case of a cut leading to bleeding?
2. Among octahedral and tetrahedral crystal fields, in which case the magnitude of crystal field splitting is larger?
3. Write the IUPAC name of the compound $CH_2(Cl)COCH(CH_3)CONH_2$
4. Which of the following compounds has a lone pair of electrons at the central atom? H_2SO_3 , H_2SO_4
5. How will you distinguish between phenol and cyclohexanol by suitable chemical test?
6. Draw the strcture of Hex-2-enoic acid.

Section II: Each question carriers 2 marks: **2 x 5 = 10 marks**

1. Determine the molarity of an antifreeze solution containing 250g water mixed with 222g ethylene glycol ($C_2H_6O_2$) (molar mass 62 g mol–1) The density of this solution is 1.07g/mL.
2. An aqueous solution containing urea was found to have boiling point more than the normal boiling point of water (373.13K). When the same solution was cooled, it was found that its freezing point is less than the normal freezing point of water (273.13K). Explain these observations.
3. The conductivity of 0.20 M solution of KCl at 298 K is $0.025 Scm^{-1}$. Calculate its molar conductivity.
4. How will you distinguish between the following pairs of compounds?

   (i) C_2H_5Br and C_2H_5Cl (ii) Phenol and chlorobenzene

5. Write the following name reaction.

   (i) Sand mayers reaction (ii) Gabriel's Phthalimide synthesis.

Section III: Each question carriers 3 marks: **3 x 13 = 39 marks**

1. Write balanced chemical equations for the following reactions.

(i) XeF_6 undergoes hydrolysis.

(ii) Phosphorus is treated with concentrated nitric acid.

(iii) Orthophosphorous acid is heated.

2. Account for the following

(i) A delta is formed at the point where the river water enters the sea.

(ii) Direct current is passed through a colloidal solution.

(iii) Ferric hydroxide sol is positively charged.

3. Primary alkyl halide (A) C_4H_9Br reacted with alcoholic KOH to give compound (B). Compound (B) is reacted with HBr to give (C) which is an isomer of (A). When (A) was reacted with sodium metal it gave a compound (D) C_8H_{18} that was different than the compound when n-butyl bromide was reacted with sodium. Give the structural formula of (A) and write the equations for all the reactions.
4. What happens when?

(i) N-Butyl chloride is treated with alcoholic KOH.
(ii) Bromobenzene is treated with Mg in the presence of dry ether.
(iii) Chlorobenzene is subjected to hydrolysis.

5. Convert :

(i) phenol to benzyl alcohol
(ii) phenol to aspirin
(iii) Methyl magnesium bromide to 2-methylpropan-2-ol

6. What are vitamins and how are they classified? Name the vitamin responsible for coagulation of blood.
7. State a reason for each of the following statements:

(i) Soaps do not work in hard water
(ii) The use of aspartame is limited to cold food and drinks
(iii) Aspirin helps in the prevention of heart attack.

8.

(a) Write the zwitter ionic structure of glycine?
(b) What is meant by inversion of sugar?
(c) Name the vitamin in each case whose deficiency causes

(i) Night blindness.
(ii) Poor coagulation of blood.

9. Write chemical equations for following reactions:

(i) Oxidation of nitrite ion by MnO_4 in acidic medium.

(ii) Acidification of potassium chromate solution.

(iii) Disproportionation of manganese (VI) in acidic solution.

10. How would you account for the following?

(i) Transition metals exhibit variable oxidation states.

(ii) Zr (Z = 40) and Hf (Z = 72) have almost identical radii.

(iii) Transition metals and their compounds act as catalyst.

11. Write the IUPAC names of the following coordination compounds:

(i) $[Cr(NH_3)_3Cl_3]$

(ii) $K_3[Fe(CN)_6]$

(iii) $[CoBr_2(en)_2]^+$, (en = ethylenediamine)

12. (a) Name one substance which can act as both

(i) Analgesic and antipyretic

(ii) Antiseptic and disinfectant

(b) Write the composition of Dettol.

13.

(i) Draw the structure of phosphinic acid (H_3PO_2).

(ii) Write a chemical reaction for its use as reducing agent.

(iii) Suggest a quantitative method for estimation of the gas which protects us from UV rays of the sun.

Section IV: Each question carriers 5 marks: **3 x 5 = 15 marks**

1. (a) Describe the following reactions.
   - Canni zaro's reaction
   - Cross aldol condensation.

   (b) How will you convert?
   - Methyl cyanide to acetamide
   - Acetaldehyde to but 2 enal.
   - Ethyl benzene to benzoic acid.

OR

(a) A compound a on oxidation given B ($C_2H_4O_2$). A reacts with dil.NaOH and on subsequent heating forms C. C on catalytic hydrogenation gives D. Identify A, B, C and D and write down the reaction involved.

(b) Write short notes on.

- Clemmenson reaction.
- Hell – Volhard – Zelinsky reaction.

2. (a) Why is chloroacetic acid more acidic than acetic acid?
(b)Write the mechanism of nucleophilic addition reaction.
(c) Give chemical tests to distinguish between the following pairs of compounds:
(i) Acetaldehyde and bezaldehyde
(ii) Propanone and propanol

OR

(a) Arrange the following pairs of compounds in an increasing order of their indicated property:

- Benzoic acid, 4- Nitrobenzoic acid, 3,4-Dinitrobenzoic acid, 4-Methoxybenzoic acid (acid strength)
- $CH_3CH_2CH(Br)COOH$, $CH_3CH(Br)CH_2COOH$, $(CH_3)CHCOOH$, $CH_3CH_2CH_2COOH$ (acid strength)

(b) How would you account for the following?

- Aldehydes are more reactive than ketones towards nucleophilic addition reaction.
- The boiling points of aldehydes and ketones are lower than of the corresponding acid
- The aldehydes and ketones undergo a number of addition reactions.

3. (a) An organic compound 'A' on treatment with ethyl alcohol give carboxylic acid 'B' and compound 'C'. Hydrolysis of 'C' under acidic conditions gives 'B' and 'D'. Oxidation of 'D' with $KMnO_4$ also gives 'B'. 'B' on heating with $Ca(OH)_2$ gives 'E' with molecular formula C_3H_6O, 'E' does not give Tollen's reagent test or reduce Fehling's solution but forms 2, 4 – dinitrophenyl hydrazone. Identify A to E.
(b) Write the conditions to maximize the yield of H_2SO_4 by contact process.
(C) Write balanced equations for the following reactions

(i) $Cu + H_2SO_4$ (conc) →
(ii) $Ca_3P_2 + H_2O$ →

OR

(a) Write chemical equations for the following processes.

- Chlorine reacts with a hot concentrated solution of sodium hydroxide
- Orthophosphorous acid is heated.
- Pt.F6 and xenon are mixed together.

(b) Complete and Write balanced equations for the following reactions.

- $SF_4 + H_2O$ →
- $P_4O_{10} + H_2O$ →