SAMPLE QUESTION PAPER
CLASS XII TERM II
CHEMISTRY (043)

MM:35   Time: 2 Hours

GENERAL INSTRUCTIONS:

Read the following instructions carefully.

1. There are **12** questions in this question paper with internal choice.
2. **SECTION A** - **Q. No. 1 to 3** are very short answer questions carrying 2 marks each.
3. **SECTION B** - **Q. No. 4 to 11** are short answer questions carrying 3 marks each.
4. **SECTION C**- **Q. No. 12** is case based question carrying 5 marks.
5. **All questions are compulsory.**
6. **Use of log tables and calculators is not allowed**

SECTION A

1. Arrange the following in the increasing order of their property indicated (any 2):

   a. CH_3CHO, CH_3CH_2OH, CH_3OCH_3, $CH_3CH_2CH_3$ (boiling point)

   b. Ethanal, propanal, propanone, butanone.

   c. Benzaldehyde, p-tolualdehyde, p-nitrobenzaldehyde, acetophenone   (1x2=2)

2. State Kohlrausch law of independent migration of ions. Write its one application.   (2)

3. Give reasons to support the answer:

   a. Cyclohexanone forms cyanohydrin in good yield but 2,2,6-trimethylcyclohexanone does not.

   b. During the preparation of esters from a carboxylic acid and an alcohol in the presence of an acid catalyst, the water or the ester should be removed as soon as it is formed. (1x2=2)

SECTION B

4. Give reason why:

   a. Aromatic primary amines cannot be prepared by Gabriel phthalimide synthesis.

   b. Primary amines have higher boiling point than tertiary amines.

   c. Aliphatic amines are stronger bases than aromatic amines.   (1x3=3)

OR

4. Convert the following:

     a. Nitrobenzene into aniline.

     b. Ethanoic acid into methanamine.

     c. Aniline into N-phenylethanamide.   (1x3=3)

5. Answer the following questions:

     a. Predict the number of unpaired electrons in the square planar $[Pt(CN)_4]^{2-}$ ion.

     b. Write the formula and hybridization of the following compound:

        Pentaamminechloridocobalt(III)   (1+2)

OR

5. Explain crystal field splitting in octahedral coordination entities with diagram.   3

6. Account for the following:

  a. Zn is not considered a transition element.

  b. Transition metals form a large number of complexes.

  c. The E^0 value for the Mn^{3+}/Mn^{2+} couple is much more positive than that for Cr^{3+}/Cr^{2+} couple.   (1x3=3)

7. An organic compound (A) on treatment with acetic acid in the presence of sulphuric acid produces an ester (B). (A) on mild oxidation gives (C). (C) with 50% KOH followed by acidification with dilute HCl generates (A) and (D). (D) with PCl_5 followed by reaction with ammonia gives (E). (E) on dehydration produces hydrocyanic acid. Identify the compounds A, B, C, D and E.   (3)

8. Give reasons for the following observations:

     a. Physisorption decreases with increase in temperature.

     b. Addition of alum purifies the water.

     c. Brownian movement provides stability to the colloidal solution.

9. What happens when reactions:

  a. Aniline reacts with chloroform in the presence of alc. KOH.

  b. Aniline reacts with acetic anhydride.

  c. Aniline reacts with excess of bromine.   (1x3=3)

OR

9. Convert the following

    a. Benzoic acid to aniline

    b. Chlorobenzene to p-chloroaniline

    c. Benzyl chloride to 2-phenylethanamine   (1x3=3)

10. The electrical resistance of a column of 0.05 mol L^{-1} NaOH solution of diameter 1 cm and length 50 cm is 5.55 * 10^3 ohm. Calculate its resistivity, conductivity and molar conductivity.

         (3)

11. Assign suitable reasons for the following:

    a. In the 3d series from Sc to Zn the enthalpy of atomization of Zn is the lowest.

    b. The Mn^{2+} compounds are more stable than Fe^{2+} towards oxidation to their +3 state.

  c. Sc^{3+} is colourless in aqueous solution, whereas Ti^{3+} is coloured.   (1x3=3)

OR

  a. Lanthanum and lutetium do not show colouration in solutions

  b. Zr and Hf have almost same atomic radius

  c. Chemistry of all the lanthanoids is quite similar.

12. Read the following passage and answer the questions.

The rate of reaction is sometimes altered by conditions. Consider a reaction between two substances when one reactant is present in large excess. During hydrolysis of 0.01 mol of ethyl acetate with 10 moles of water, in presence of H^+, the rate law was determined by taking conc. After 30 min and conc. reduced from 0.85 to 0.80 in 30 min.

    a. What will be the rate constant of reaction given in the passage? [log17=1.2304, log16=1.2041]

    b. What are the molecularity and order of the reaction respectively?

    c. What will be order of reaction if ester is hydrolysed by using NaOH?

    d. The rate of reaction does not remain constant throughout the course of reaction? Give reason.

    e. Powered sugar dissolves faster than crystalline sugar. Give reason.