CBSE PRACTICE-2 QUESTIONS PAPER (2021-22)
TERM–II
SUBJECT: CHEMISTRY

**Time : 2 Hours**   **Max. Marks : 35**

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. **(a)** Arrange the following compound ds in increasing order of their boiling points.
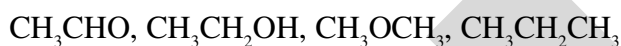
   CH_3CHO, CH_3CH_2OH, CH_3OCH_3, $CH_3CH_2CH_3$ **[1 × 2 = 2 Marks]**

   (b) Arrange the following compounds in increasing order of their reactivity in nucleophilic

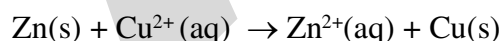   addition reactions.

   Ethanal, Propanal, Propanone, Butanone.

OR

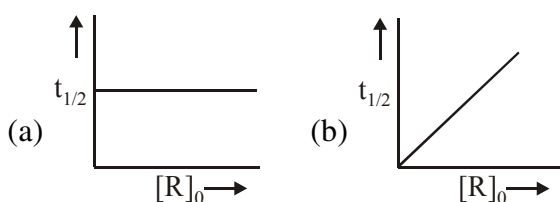   Benzaldehyde, p-Tolualdehyde, p-Nitrobenzaldehyde, Acetophenone.

   Hint : Consider steric effect and electronic effect.

2. Calculate G° for the reaction   **[2 Marks]**

   $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$

   Given: E° for $Zn^{2+}/Zn = –0.76$ and

                  E° for $Cu^{+2}/Cu = +0.34$ V

                  $R = 8.314$ $JK^{-1}mol^{-1}$

                  $F = 96500$ mol^{-1}

3. Define order of reaction. Predict the order of reaction in the given graphs :   **[1 × 2 = 2 Marks]**

(a)   (b)

where $[R]_0$ is the initial concentration of reactant and $t_{1/2}$ is half-life.

SECTION-B

4. State reasons for the following: **[1 × 3 = 3 Marks]**

(a) pK_b value for aniline is more than that for methylamine.

(b) Ethylamine is soluble in water whereas aniline is not soluble in water.

(c) Primary amines have higher boiling points than tertiary amines.

OR

4. Accomplish the following conversions :   **[1 × 3 = 3 Marks]**

(a) Benzoic acid to aniline

(b) Aniline to p-bromoaniline

(c) Aniline to benzyl alcohol

5. For the complex $[Fe(CN)_6]^{4-}$, write the hybridization, magnetic character and spin type of the complex. (At. number : Fe = 26)   **[1 + 2 = 3 Marks]**

OR

(a) Using IUPAC norms, write the formulae for the following complexes :
Tetraamminediaquacobalt(III) chloride

(b) Defind the following terms with a suitable example of each :   **[1 + 2 = 3 Marks]**

(i) Chelate complex

(ii) Ambidentate ligand

6. Account for the following   **[1 × 3 = 3 Marks]**

(a) Mn shows the highest oxidation state of +7 with oxygen but with fluorine it shows the highest oxidation state of +4.

(b) Zirconium and Hafnium exhibit similar properties.

(c) Transition metals act as catalysts.

7. An aromatic compound 'A' (Molecular formula C_8H_8O) gives positive 2,4-DNP test. It gives a yellow precipitate of compound 'B' on treatment with iodine and sodium hydroxide solution. Compound 'A' does not give Tollen's or Fehling test. On drastic oxidation with potassium permanganate it forms a carboxylic acid 'C' (Molecular formula $C_7H_6O_2$), which also formed along with the yellow compound in the above reaction. Identify A, B and C and write all the reactions involved. **[3 Marks]**
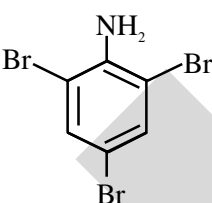
8. Explain what is observed

   (a) When a beam of light is passed through a colloidal sol.

   (b) An electrolyte. NaCl is added to hydrated ferric oxide sol.

   (c) Electric current is passed through a colloidal sol.

9. Account for any *two* of the following: **[1 × 3 = 3 Marks]**

   (a) Amines are basic substances while amides are neutral.

   (b) Nitro compounds have higher boiling points than the hydrocarbons having almost the same molecular mass.

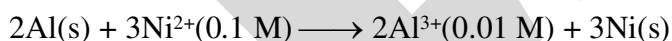   (c) Aromatic amines are weaker bases than aliphatic amines.

OR

(a) Write IUPAC name of .

(b) $A \xrightarrow[273-278K]{HNO_2} B \xrightarrow{HBF_4} C \xrightarrow[Cu\Delta]{NaNO_2} D$
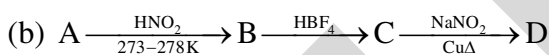
10. Represent the cell in which the following reaction takes place: **[3 Marks]**

    $2Al(s) + 3Ni^{2+}(0.1\ M) \longrightarrow 2Al^{3+}(0.01\ M) + 3Ni(s)$

    Calculate its emf if $E^0_{cell} = 1.41V$

11. Give reasons for the following : **[1 × 3 = 3 Marks]**

    (a) Transition metals have high enthalpies of atomization.

    (b) Manganese has lower melting point even though it has a higher number of unpaired electrons for bonding.

    (c) Ce^{4+} is a strong oxidising agent.

OR

Give reasons : **(CBSE 2018)**

(a) E^0 value for **Mn^{3+}/Mn^{2+}** couple is much more positive than that for **Fe^{3+}/Fe^{2+}**.

(b) Iron has higher enthalpy of atomization than that of copper.

(c) Sc^{3+} is colourless in aqueous solution whereas **Ti^{3+}** is coloured.

SECTION-C

12. **PASSAGE**

Molar conductivity of a solution is the conductance of solution containing one mole of electrolyte, kept between two electrodes having unit length between them and large cross sectional area so as to contain the electrolyte. In other words, molar conductivity is the conductance of the electrolytic solution kept between the electrodes of a conductivity cell at unit distance but having area of cross section large enough to accommodate sufficient volume of solution that contains one mole of the electrolyte. It is denoted by Λ_m. **[1 + 1 + 1 + 2 = 5 Marks]**

(a) Write the mathematical expression for molar conductivity.

(b) What are the units of molar conductivity, Λ_m ?

(c) Conductivity of 0.00241M acetic acid is $7.896 \times 10^{-5}\, S\, cm^{-1}$. Calculate its molar conductivity in this solution ?

(d) How does molar conductivity varies with concentration for strong as well as weak electrolytes ?

OR

Give the graphical representation of variation of conductivity with concentration for weak electrolytes ?