Chemistry_XII | Sample Mock Paper Class 12th SA2(Paper_2)

Name : ....
Date : 07-03-2022

Time : 120 Mins
M.M. : 35

General Instructions:

1. Question 1 to 3 Short answer type (SA1) questions of 2 Mark each.

2. Question 4 to 11 Short answer type (SA2) questions of 3 Mark each.

3. Question 12 Long answer type (LA) questions of 5 Mark each.

Q1 Give the name, the sterochemistry and the magnetic behaviour of the following complexes: **2**

(a) $[Co(NH_3)_5Cl]Cl_2$
(b) $K_2[Ni(CN)_4]$

Q2 Calculate the cell e.m.f. and ΔG for the cell reaction at 25°C for the cell: **2**

Zn (s) | $Zn^{2\oplus}$ (1 M) || $Cd^{2\oplus}$ (1 M) | Cd (s)

Given : E° values at 25°C : $E°_{Zn^{2\oplus}/Zn}$ = – 0.76 V and $E°_{Cd^{2\oplus}/Cd}$ = – 0.403 V

1 F = 96500 C mol^{-1},   R = 8.314 J K^{-1} mol^{-1}.

Q3 How will you convert **2**

(a) Benzenaldehyde to α-hydroxyphenyl acetic acid?

(b) Benzenaldehyde to benzephenone?

Q4 An aromatic compound 'A' on treatment with aqueous ammonia and heating forms compound 'B' which on heating with Br_2 and KOH forms a compound 'C' of molecular formula C_6H_7N. Write the structures and IUPAC names of compounds A, B and C. **3**

Q5 Give the structures of A, B and C in the following reactions: **3**

(a) $CH_3Br \xrightarrow{KCN} A \xrightarrow{LiAlH_4} B \xrightarrow[273 \text{ K}]{HNO_2} C$

(b) $CH_3COOH \xrightarrow[\Delta]{NH_3} A \xrightarrow{Br_2 + KOH} B \xrightarrow{CHCl_3 + NaOH} C$

Q6 A current of 1.70 amp was passed through 300 ml of 0.160 M solution of $ZnSO_4$ for 230 sec with a current efficiency of 90%. Find the molarity of zinc (Zn^{+2}) after the deposition of zinc. Assume that volume of solution remains constant during electrolysis. **3**

Q7 Give chemical reaction of Lanthanides with water, nitrogen sulphur, oxygen or hydrochloric acid. **3**

Q8   The decomposition of NH_3 on platinum surface: **3**

$$2NH_3(g) \xrightarrow{Pt} N_2(g) + 3H_2(g)$$

is a zero order reaction with $k = 2.5 \times 10^{-4}$ mol $L^{-1}s^{-1}$.

What are the rates of production of N_2 and H_2?

Q9   What is an adsorption isotherm? Describe Freundlich adsorption isotherm. **3**

Q10   Explain the following observations: **3**

(a) Cu^+ ion is unstable in aqueous solutions.

(b)   Although Co^{2+} ion appears to be stable, it is easily oxidised to Co^{3+} ion in the presence of a strong ligand.

(c)   The $E°_{Mn^{2+}/Mn}$ value for manganese is much more than expected from the trend for other elements in the series.

Q11   Write the structures of main products when aniline reacts with the following reagents: **3**

(a) Br_2 water   (b)   HCl   (c) $(CH_3CO)_2O$/pyridine

Q12   (a)   Illustrate the following name reactions by giving example: **5**

(i)   Cannizzaro's reaction.   (ii)   Clemmensen reduction.

(b)   An organic compound A contains 69.77% carbon, 11.63% hydrogen and rest oxygen. The molecular mass of the compound is 86. It does not reduce Tollen's reagent but form an addition compound with sodium hydrogen sulphite and gives positive iodoform test. On vigorous oxidation it gives enthanoic and propanoic acids. Derive the possible structure of compound A.