



Board Paper of Class 12-Science 2022 Chemistry Term-II Delhi(Set 1)

Total Time: 120

Total Marks: 35.0

Section A

Q.No.1: Answer the following questions (Do any two):

(a) Identify the order of reaction from the following unit for its rate constant:

$$\text{Lmol}^{-1}\text{s}^{-1}$$

(b) The conversion of molecules A to B follow second order kinetics. If concentration of A is increased to three times, how will it affect the rate of formation of B?

(c) Write the expression of integrated rate equation for zero order reaction.

Marks:[2.00]

Q.No.2: Arrange the following in the increasing order of their property indicated:

(a) Ethanal, Propanone, Propanal, Butanone (reactivity towards nucleophilic addition)

(b) 4-Nitrobenzoic acid, benzoic acid, 3,4-Dinitrobenzoic acid, 4-Methoxy benzoic acid (Acid strength)

Marks:[2.00]

Q.No.3: Explain the following reactions :

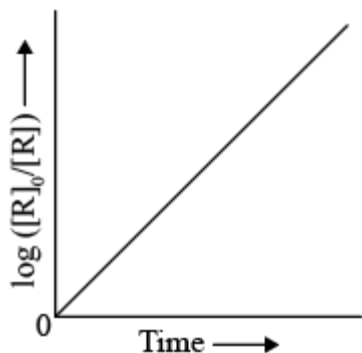
(a) Wolff Kishner reduction

(b) Cannizzaro reaction

Marks:[2.00]

Section B

Q.No.4: Observe the graph shown in figure and answer the following questions :



- (a) What is the order of the reaction ?
 (b) What is the slope of the curve ?
 (c) Write the relationship between k and $t_{\frac{1}{2}}$ (half life period) **Marks:[3.00]**

Q.No.5: (i) Write the IUPAC name of the following complex:
 $K_2[PdCl_4]$

- (ii) Using crystal field theory, write the electronic configuration of d^5 ion, if $\Delta_0 > P$.
 (iii) What are Homoleptic complexes?

OR

- (i) Why chelate complexes are more stable than complexes with unidentate ligands?
 (ii) What is "spectrochemical series"? What is the difference between a weak field ligand and a strong field ligand? **Marks:[3.00]**

- Q.No.6:** (i) Define coagulation.
 (ii) State Hardy-Schulze rule.
 (iii) What is Electrophoresis?

OR

Write three differences between Physisorption and Chemisorption.

Marks:[3.00]

- Q.No.7:** (a) Write any two consequences of Lanthanoid Contraction.
 (b) Name the element of 3d series which exhibits the largest number of oxidation states. Give reason. **Marks:[3.00]**

Q.No.8: Give reasons for the following statements:

- (a) Copper does not displace hydrogen from acids.
- (b) Transition metals and most of their compounds show paramagnetic behaviour.
- (c) Zn, Cd and Hg are soft metals.

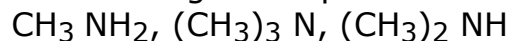
Marks:[3.00]

Q.No.9: Account for the following:

- (i) pK_b of aniline is more than that of methylamine.
- (ii) Aniline does not undergo Friedel-Crafts reaction.
- (iii) Primary amines have higher boiling points than tertiary amines.

OR

(i) Arrange the following compounds in the increasing order of their basic strength in aqueous solution:



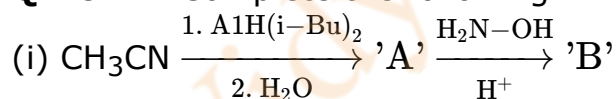
- (ii) What is Hinsberg's reagent?
- (iii) What is the role of pyridine in the acylation reaction of amines?

Marks:[3.00]

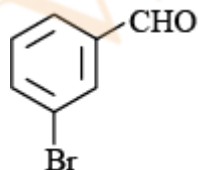
Q.No.10: A compound 'A' on reduction with iron scrap and hydrochloric acid gives compound 'B' with molecular formula C_6H_7N . Compound 'B' on reaction with $CHCl_3$ and alcoholic KOH produces an obnoxious smell of carbonylamine due to the formation of 'C'. Identify 'A', 'B' and 'C' and write the chemical reactions involved.

Marks:[3.00]

Q.No.11: Complete the following:



(ii) Write IUPAC name of the following compound:



(iii) Write chemical test to distinguish between the following compounds:
Phenol and Benzoic acid

OR

Convert the following:

- (i) Benzoic acid to Benzaldehyde
- (ii) Propan-1-ol to 2-Bromopropanoic acid
- (iii) Acetaldehyde to But-2-enal

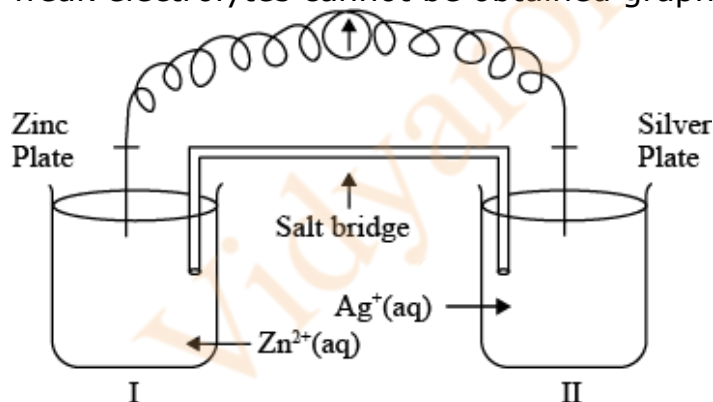
Marks:[3.00]

Section C

Q.No.12: Read the passage given below and answer the questions that follow:

Oxidation-reduction reactions are commonly known as redox reactions. They involve transfer of electrons from one species to another. In a spontaneous reaction, energy is released which can be used to do useful work. The reaction is split into two half reactions. Two different containers are used and a wire is used to drive the electrons from one side to the other and a Voltaic/Galvanic cell is created. It is an electrochemical cell that uses spontaneous redox reactions to generate electricity. A salt bridge also connects to the half cells. The reading of the voltmeter gives the cell voltage or cell potential or electromotive force. If E_{cell}° is positive the reaction is spontaneous and if it is negative the reaction is non-spontaneous and is referred to as electrolytic cell. Electrolysis refers to the decomposition of a substance by an electric current. One mole of electric charge when passed through a cell will discharge half a mole of a divalent metal ion such as Cu^{2+} . This was first formulated by Faraday in the form of laws of electrolysis.

The conductance of material is the property of materials due to which a material allows the flow of ions through itself and thus conducts electricity. Conductivity is represented by, k and it depends upon nature and concentration of electrolyte, temperature etc. A more common term molar conductivity of a solution at a given concentration is conductance of the volume of solution containing one mole of electrolyte kept between two electrodes with the unit area of cross-section and distance of unit length. Limiting molar conductivity of weak electrolytes cannot be obtained graphically.



- (a) Is silver plate the anode or cathode?
- (b) What will happen if the salt bridge is removed?
- (c) When does electro-chemical cell behaves like an electrolytic cell?
- (d) (i) What will happen to the concentration of Zn^{2+} and Ag^{+} when $E_{\text{cell}} = 0$.
(ii) Why does conductivity of a solution decreases with dilution?

OR

- (d) The molar conductivity of a 1.5 M solution of an electrolyte is found to be $138.9 \text{ S cm}^2 \text{ mol}^{-1}$. Calculate the conductivity of this solution. **Marks:[5.00]**