

Time : 2 Hrs.

M.M.-35

## General Instructions:

- 1- There are three sections in the question paper namely Section A, Section B, and Section C.
- 2- Section A consists of 3 questions. Each question carries 2 Marks.
- 3- Section B consists of 8 questions. Each question carries 3 Marks.
- 4- Section C consists of 1 question carries 5 marks.
- 5- All questions are compulsory.
- 6- There are 12 questions in the question papers with internal choice.
- 7- Use of Log Table and calculator is not allowed.

## Section – A

1. What are the products obtained at anode and cathode by electrolysis of aqueous silver nitrate using Pt electrodes? Give the chemical equations involved. (2)
2. What are the differences between order and molecularity of a reaction? Give any four differences. (2)
3. Explain the following terms with examples. (2)
  - (a) Lyophilic colloids
  - (b) Peptisation

## Section – B

4. Explain the following:- (1x3=3)
  - (a) Zn, Cd & Hg are not considered as transition metals.
  - (b)  $\text{Cu}^+$  ion is not stable in aqueous solution.
  - (c) Transition metals form alloys.
5. Write the IUPAC names of the following compounds:- (1x3=3)
  - (a)  $\text{K}_4[\text{Fe}(\text{CN})_6]$
  - (b)  $[\text{Cr}(\text{PPh}_3)(\text{CO})_5]$
  - (c)  $[\text{Ni}(\text{CO})_4]$

Or

Explain the structure and magnetic behavior of  $[\text{Ni}(\text{CO})_4]$  &  $[\text{Ni}(\text{CN})_4]^{2-}$  on basis of V.B. Theory.

6. Show how each of the following compounds could be converted to benzene? (1x3=3)
  - (a) Acetophenone
  - (b) Salicylic acid
  - (c) Aniline

Or

What is meant by the following terms?

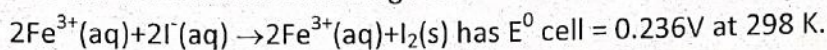
- (a) Tollen's Reagent
- (b) Aldol
- (c) Cannizzaro's Reaction



7. Arrange the following in the increasing order of their strength:- (1.5x2=3)
- (a)  $C_2H_5NH_2, C_6H_5NH_2, NH_3, C_6H_5CH_2NH_2, (C_2H_5)_2NH$
- (b)  $C_2H_5NH_2, (C_2H_5)_2NH, (C_2H_5)_3NH, (C_2H_5)_3N, C_2H_5NH_2$
8. Calculate the EMF of the cell in which the following reaction takes place:- (3)
- $Ni(s) + 2Ag^+(0.002M) \rightarrow Ni^{+2}(0.160M) + 2Ag(s)$
- Given that  $E^\circ_{cell} = 1.05V$

Or

The cell in which the following reaction occurs:-



Calculate the standard Gibb's free energy and equilibrium constant of the cell.

9. Show that in case of first order reaction, the time required for 99.9% of the reaction to take place is about 10 times that required for half of the reaction. (3)
10. Which of the following compounds would undergo Aldol Condensation, which the Cannizzaro's reaction and which neither? Write the expected products of Aldol Condensation and Cannizzaro's reaction. (1 x 3 = 3)
- (a) Benzaldehyde (b) Methanol (c) 2-methyl pentanal
11. Explain the following:- (1 x 3 = 3)
- (a) What is meant by 'Lanthanoid Contraction'?
- (b) Why do transition metals show variable oxidation states?
- (c) Write the formula of an oxo anion of chromium (Cr) in which it shows the oxidation state equal to its group number.

### Section - C

12. Read the following case study/situation and answer the following questions:- (1 x 5 = 5)
- Ligands are atoms or ions which can donate electrons to central atoms. Ligands can be monodentate, bidentate or polydentate as well. Few ligands can co-ordinate with central atom through more than one site, these are called ambidentate ligands. When a di-or polydentate ligand uses its two or more donor atoms to kind a single metalion, it is said to be chelating ligand.
- (a) Define ligands. Give an example.
- (b) Give an example of each monodentate and bidentate ligands.
- (c) What do you meant by ambidentate ligands? Give example.
- (d) What are chelats. Give example.
- (e) Draw structure of a hexadenate ligand.

Or

Define Co-ordination sphere.



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## Section – A

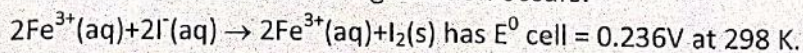
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 Given that  $E^\circ_{\text{cell}} = 1.05\text{V}$

Or

The cell in which the following reaction occurs:-



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