

2025
(Session : 2022-26)

Time : 3 hours

Full Marks : 75

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

(Compulsory)

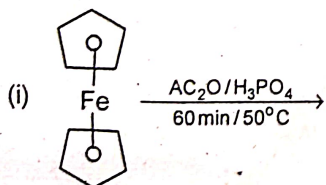
1. Answer the following questions : 1×5 = 5
 - (a) What is the hapticity of Cp (cyclopentadienyl) in Ferrocene ?
 - (b) What is co-ordination number ?
 - (c) What is the primary role of Hemoglobin.

- (d) ∞ mixture of TiCl_4 and triethyl aluminium in a hydrocarbon is called _____.
- (e) Which metal is used in Wilkinson's catalyst ?
2. (a) What are organometallic compounds ? 3
 (b) Identify the first-row transition metal (M) for the following $18e^-$ species. 2
 (i) $[\text{M}(\text{CO})_4]^{2-}$
 (ii) $[\text{HM}(\text{CO})_5]$
3. Explain effective atomic number with example. 5

Group – B

Answer any four questions of the following :

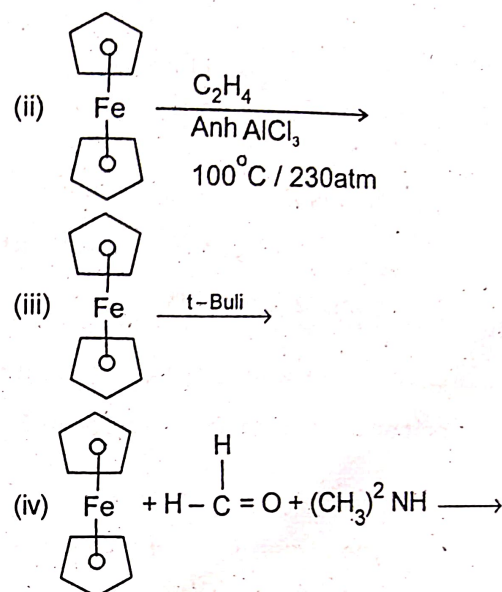
4. (a) Discuss the preparation, structure and bonding of Zeise's salt. 7
 (b) Complete the following reaction. 8



HD – 108/3

(2)

Contd.



5. (a) Explain Na / k Pump. 10
 (b) Discuss the role of Ca^{+2} in blood, clotting. 5
6. (a) Explain the hydrogenation of alkene using Wilkinson's catalyst. 7
 (b) What is Wacker process ? Give its mechanism. 8

HD – 108/3

(3)

(Turn over)

7. (a) Explain the structural features of methyl lithium. 5

(b) What is Ziegler-Natta catalyst ? Discuss the role of Ziegler-Natta catalyst in polymerization of ethene. 10

8. Give preparation, structure, bonding and properties of mononuclear carbonyl of 3d metals. 15

9. Write short notes on any **three** of the following : 5×3 = 15

(a) Fischer Tropsch reaction

(b) Schlenk equilibrium

(c) Hydroformylation

(d) Synergic effect

(e) 18 e⁻ rule

