(3 Hours) **Marks 80**

N.B. 1 Question number ONE is compulsory
2 Attempt any THREE questions out of remaining FIVE
3 Figure to right indicate full marks

01. Answer any four questions from the following. **20**

(a) State the principle of Conductometry and explain the conductometric titration curves of mixture of strong acid and a weak acid Vs strong base and weak base.

(b) Explain preparation of $Fe(CO)_5$ molecule. Express their bonding, hybridization and structure.

(c) Interpret reactive intermediates? Distinguish between transition state and intermediate.(Any 4 difference)

(d) Give an account of geometrical isomerism in inorganic complex with CN-6

(e) Give synthesis of Methyl orange dye with reaction. Write two properties & applications.

(f) Related with chirality explain the following terms with examples.
(i) Centre of symmetry (ii) Plane of symmetry

02. (a) What is Effective Atomic Number? Calculate EAN of $[Fe(CO)_5]$and $[V(CO)_6]$. **5**

(b) Define following terms with their units **5**
(i) Molar conductance (ii) Equivalent conductance

(c) Give the synthesis of Congo red dye. Give any two applications. **5**

(d) Give the statement of Nernst Distribution law and explain briefly batch extraction process. **5**

03. (a) Explain deficiency symptoms of following nutrients in plants:- **5**
(i) Fe (ii) Ca (iii)N, (iv)K, (v)P

(b) Discuss Michael addition reaction with its mechanism. **5**

(c) Discuss the synthesis of Alizarin with their reaction. **5**

(d) Write a note on – Separation of Lanthanides. **5**

04. (a) Give the mechanism and applications of Pinacol-Pinacolone rearrangement reaction. **5**

(b) Define and explain the terms- ligand and coordination number with their examples. **5**

(c) Discuss carbene & its type. Explain their structure & stability. **5**

(d) Discuss the manufacture of ammonium sulphate. **5**

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05.	**(a)**	Explain the Nitration of Chlorobenzene w.r.t. thermodynamically and kinetically controlled reaction.	**5**
	(b)	Write a note on Carbonic anhydrase. Give their application.	**5**
	(c)	Explain briefly the principle of solvent extraction.	**5**
	(d)	Discuss both Norrish type-I and Norrish type-II reaction with their examples.	**5**
06.	**(a)**	Give an account of geometrical isomerism in inorganic complex with CN-4	**5**
	(b)	Calculate CFSE for d^4 and d^7 system in the strong field and weak field ligand of octahedral complex.	**5**
	(c)	Explain the effect of temperature and dilution on equivalent conductance with its graphical presentation.	**5**
	(d)	Give the IUPAC names of the following complex compounds. (i) $[Co(NH_3)_3Cl_3]$ (ii) $[Fe(H_2O)_5(NO)]SO_4$	**5**

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