Time: 3 Hours **Marks:80**

N.B.: 1. Questions no. 1 is compulsory.

2. Attempt any three questions from remaining five questions

3. Figures to the right indicates full marks.

Q1. **Attempt any four questions of the following** **[20]**

a. Differentiate between Transition and Intermediate.

b. During the electrolysis of copper sulphate solution, loss of copper in the anode compartment was 0.420 g. In a voltameter connected in series, 1.058 g of copper was deposited. Find the transport number of copper ion.

c. Write the IUPAC names of the following co-ordination compounds-
(i) Na $[Mn(CO)_5]$ (ii) $K_3[Co(CN)_5NO]$

d. Explain role of complexing agent in solvent extraction.

e. Write a note on Enantiomers.

f. Discuss the synthesis of Methyl orange with reaction.

Q2. a. What is CFSE? Calculate CFSE OF d^4 and d^6 in octahedral complexes. **[5]**

b. Define the terms ((i) specific conductance, (ii) equivalent conductance. **[5]**

c. Write a note on optical isomerism of Lactic acid. **[5]**

d. Explain Pinacol-pinacolone rearrangement reaction with mechanism. **[5]**

Q3. a. Write a short note on transport number. **[5]**

b. What is EAN? Calculate EAN of $[Pt(Cl)_6]^{2-}$ **[5]**

c. Explain the role of following nutrients in plant growth- **[5]**
(i) N ii) P iii) K

[5]

d. Explain Lanthanide separation in detail.

Q4. a. Explain effect of temperature and dilution on conductance **[5]**

b. Discuss thermodynamically and kinetically controlled reaction w.r.t Nitration of chlorobenzene. **[5]**

[5]

c. Discuss the limitations of CFT.

d. State Nernst distribution law and explain an expression for amount of solute left unextracted after single extraction . **[5]**

Q5. a. Explain preparation, properties, and bonding involved in $Fe(CO)_5$ [5]

b. Discuss R & S system of Nomenclature. [5]

c. Describe the conductometric titration of weak acid Vs weak base . [5]

d. Explain formation, structure and stability of Carbanion. [5]

Q6. a. Discuss the manufacture of ammonium sulphate. [5]

b. A certain extraction system has a distribution ratio of 10. If 300 mg of solute is dissolved in 100 ml of solvent A, find out total amount of solute extracted by two extractions with 50 ml of solvent B which is immiscible with solvent A.(The solute has molecular weight 71). [5]

c. Write Geometrical isomerism of co-ordination number 4. [5]

d. Define stereochemistry. and differentiate between configurational and conformational stereoisomers. [5]

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