04/06/2025 SE CHEMICAL SEM-III C-SCHEME IEC-I QP CODE: 10082502

Time: 3 Hours **Marks:80**

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

2. Attempt any three questions from remaining five questions

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

a. Write the chemical formula of the following co-ordination compounds.
   (i) Dicyanoargentate (i) ion
   (ii) Tris (ethylenediamine) chromium (iii) chloride
b. Discuss the synthesis of Alizarin with reaction
c. Explain E&Z system of Nomenclature
d. Describe the conductometric titration of strong acid Vs weak base .
e. Explain Lanthanide separation in detail.
f. Discuss thermodynamically and kinetically controlled reaction wrt sulphonation of naphthalene.

Q2. a. What is EAN? Calculate EAN of $[Pt(NH_3)_4]^{2+}$ [5]

b. Explain inductive effect and hyper conjugation with suitable example to explain the stability of Carbocation. [5]

c. Define the terms ((i)specific conductance,
(ii)equivalent conductance
(iii)molar conductance [5]

d. Explain role of complexing agent in solvent extraction. [5]

Q.3. a. What is CFSE? Calculate CFSE OF d^4 and d^7 in octahedral complexes. [5]

b. The speed ratio of silver and nitrate ions in a solution of silver nitrate electrolysed between silver electrodes is 0.916. Find the transport number of silver and nitrate ions. [5]

c. Explain the applications of cytochrome. [5]

d. Explain the reaction with mechanism when 1,2 vicinal diols are heated with sulphuric acid. [5]

Q.4. a. Write a note on optical isomerism of lactic acid. [5]

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

c. Define the terms -Coordination number and ligands. Explain the types of ligands with suitable examples [5]

d. Explain determination of transport number by moving boundary method. [5]

Q.5. a. Explain preparation, and bonding involved in $Fe_2(CO)_9$ [5]

b. Explain effect of temperature and dilution on conductance. [5]

c. Explain the manufacture of ammonium sulphate. [5]

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

Q.6.a. Write the IUPAC names of the following co-ordination compounds,
(i) $(NH_4)_3[Cr(SCN)_6]$, (ii) $[Co(NH_3)_6]Cl_3$ [5]

b. Differentiate between Enantiomers and Diastereomers with suitable example. [5]

c. Differentiate between Transition state and Intermediate. [5]

d. 250ml of an aqueous solution containing 0.30g of solute X is extracted two times with 30ml of organic solvent. What will be the amount of solute remain in aqueous solution, if the distribution ratio in favour of ether is 15.5. [5]
