

1T00533 - S.E.(Chemical Engineering)(SEM-III)(Choice Base Credit Grading System) (R- 19) (C Scheme) / 50722 - Industrial & Engineering Chemistry I
QP CODE: 10024724 DATE : 26/05/2023

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

- Explain the moving boundary method for determination of transport number.
- What is CFSE? Calculate CFSE FOR d^4 and d^6 in octahedral complexes.
- Explain briefly the principles of solvent extraction.
- Differentiate between Transition and Intermediate.
- Discuss the synthesis of Methyl orange with reaction
- Related with chirality explain the following terms with examples-
 - Plane of symmetry
 - Centre of symmetry

Q.2. a) What is EAN? Calculate EAN of $[\text{Ni}(\text{CO})_4]$.

[05]

b) Write short notes on- Separation of Lanthanides.

[05]

c). Discuss the synthesis of Alizarin with reaction.

[05]

d) What is the principle of conductometric titration? Explain weak acid- strong base titration, with help of graphical representation.

[05]

Q.3. a) Explain in detail, what is the effect of temperature on conductance.

[05]

b) Write a note on optical isomerism of Lactic acid.

[05]

c) Explain the geometrical isomerism in co-ordination compounds with respect to co-ordination no 6.

[05]

d) Discuss inductive effect and hyperconjugation with suitable example to explain the stability of carbocation.

[05]

Q.4. a) Explain preparation, properties, and bonding involved in $\text{Fe}(\text{CO})_5$

[05]

b) Describe following terms.

(i) Specific Conductance. (ii) Equivalent Conductance. (iii) Molar conductance

[05]

c) Discuss R & S system of Nomenclature.

[05]

d) Give mechanism and applications of Pinacol-Pinacolone rearrangement.

[05]

Q.5. a) An extraction system has distribution of 10. If 30mg of solute is dissolved in 100 ml of solvent 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]. [05]

b) Explain the role of following nutrients in plant growth-

(i) N ii) P iii) K [05]

c) Write the IUPAC names of the following co-ordination compounds-

(i) $\text{Na}[\text{Mn}(\text{CO})_5]$ (ii) $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$ [05]

d) Explain oxygen transfer bio molecular reactions containing iron. [05]

Q.6. a) What is Nernst distribution law? Explain Continuous extraction in detail. [05]

b) Discuss the manufacture of ammonium sulphate. [05]

c) Discuss thermodynamically and kinetically controlled reaction wrt

Friedel-craft reaction. [05]

d) What are the drawbacks of CFT?. [05]
