

(3 Hours)

[ Total Marks : 80

N.B. : (1) Question No.1 is Compulsory.

(2) Attempt any three questions from remaining questions.

1. Answer any four from the following :

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- (a) Explain the origin of charge on colloidal particles?
- (b) Define the following terms:-
  - (i) Equivalent conductance
  - (ii) Specific conductance
  - (iii) Molar conductance
- (c) What is the principle of amperometric titration? Explain the curve obtained in titration of Pb (II) ions against sulphate ions.
- (d) Explain the continuous extraction technique for solvent heavier than water.
- (e) Discuss the kinetics of acid base catalysis.
- (f) Explain the splitting of NMR signal in propionaldehyde and Isopropyl bromide.
- (g) Give the principle of paper chromatography. Explain the radial paper chromatography in detail?

2. (a) What are the advantages and limitations of Conductometric titrations? 5
- (b) State Nernst distribution law and explain and expression for amount of solute left unreacted after single extraction. 5
- (c) Write a note on Donnan membrane equilibrium? 5
- (d) Define catalyst? Discuss any four characteristics of catalyst? 5

TURN OVER



3. (a) Compare between IR Spectroscopy and UV spectroscopy ? 5  
 (b) How Lanthanides are separated by ion exchange method ? 5  
 (c) In a certain solvent extraction the distribution ratio of the solute in favour of the organic solvent is 25. calculate the % extraction if a single extraction is carried out using volume ratio 5  
     (i)  $V_o/V_w = 0.5$  and  $V_o/V_w = 8$ .  
 (d) Explain the Huckel rule and expedite the Aromaticity of anthracene ? 5
4. (a) Explain debye huckel theory of strong electrolytes. 5  
 (b) How is flame photometry used for quantitative estimation of metals ? 5  
 (c) Write a short note on transport number.  
 (d) Give the reparation of following compounds starting from acetoacetic ester. 5  
     (i) Ethyl methyl ketone  
     (ii) Glutaric acid
5. (a) What is catalyst poison ? Explain types of poisons with suitable example & mechanism. 5  
 (b) Explain why pyridine is more basic than pyrrole. 5  
 (c) What are surfactants? Explain the applications of surfactants in pesticides & detergents. 5  
 (d) Classify the chromatographic methods on the basis of stationary phase & mobile phase. 5
6. (a) Aqueous solution of  $100\text{cm}^3$  is extracted twice with  $40\text{cm}^3$  portions of an organic phase. If the % extraction is 99% , calculate the value of the distribution ratio in favour of the organic phase. 5  
 (b) How would you prepare the following compounds from diethyl malonate 5  
     (i) Succinic acid      (ii) Barbituric acid.  
 (c) Explain the electrophilic substitution reactions of furan. 5  
 (d) Write a note on intermediate compound theory ? 5

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