S.E - IV Sem - Chem.

(1) Engineering Chemistry - II

(28) SE/IV/CHEM/CBGS/EC-II

QP Code : **5331**

(3 Hours) [Total Marks : 80

N. B. : (1) Question no. 1 is **compulsory**.
(2) Attempt any **three** questions from the remaining questions.

1. Answer any **four** of the following :- 20

(a) Discuss the validity of the statement that 'A catalust only hastens the approach of equilibrium in a reversible reaction but it does not alters the position of the equilibrium.

(b) How will you synthesise butanone from ethyl acetate.

(c) Define (i) Specific conductance
(ii) Equivalent conductance
(iii) Molar conductance

(d) Give the principle of paper cheomatography. Explain Radial paper chromatography in detail.

(e) Explain the origin of charge on colloidal particles.

(f) What is the principle of amperometric titration? Explain the curve obtained in the titration of Pb(II) ion against sulphate ions.

2. (a) 5.9 gm of common salt is passed through a cation exchanges in H^+ form. Calculate the weight of HCl that will be formed. 5

(b) What is shielding and de-shielding. Explain the splitting of NMR signal for 5

$CH_3–CH_2–CH_2–Cl$

(c) Explain the aromacity of Furan or anthracene. 5

(d) Explain liquid junction potential. 5

3. (a) The distribution ratio for iodine between CS_2 and water is 450. If 100 ml of an aqeous solution containing 1.018 mg iodine is equilibrated twice with 50 cm^3 portion of CS_2. What amount of iodine will remain unextracted in water after second extraction. 5

(b) What is the principle of infrared spectroscopy Give two application in detail. 5

(c) What is acid-base catalysis. Give the mechanism for both acid and base catalysis. 5

(d) Explain why pyridine is more basis than pyrrole. 5

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4. Write a note on TLC :–

(a) Explain debye-huckel theory of strong electrolytes. 5

(b) How would you prepare the following compound from diethyl malonate 5

(i) Succinic acid

(ii) Barbituric acid

(c) Using flame photometer. Estimate the amount of sodium present in the given sample. 5

(d) Explain emulsions with one example each. 5

5. (a) State Nerns't distribution law and explain an expression for amount of solute left unextracted after signle extraction. 5

(b) Explain the phenomenon of electrophoresis with neat labelled diagram. 5

(c) Explain the intermediate theory and adsorption theory of catalysis. 5

(d) Give the principle of HPLC and give two applications. 5

6. (a) Explain continuous solvent extraction method in detail. 5

(b) Give the preparation of ethylacetoacetate with mechanism. 5

(c) Derive an expression for emf of a concentration cell without transference. 5

(d) Explain the principle of uv-visible spectroscopy. 5