

[Time: Three Hours]

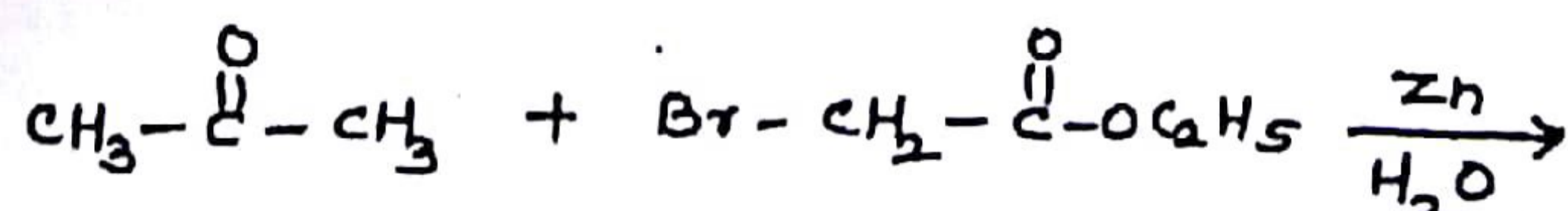
[Marks:80]

CHEM - EC - II

Please check whether you have got the right question paper.

- N.B: 1. Question.No.1 is compulsory.
2. Attempt any three questions from Q.No.2 to Q.No.6

- Q.1** Attempt any four of the following: 20
- Explain in detail the technique of thin Layer chromatography. How can be the purity of the given sample determined using TLC?
 - Explain Keto-enol tautomerism with examples.
 - Explain how solubility of a sparingly soluble salt is determined by the e.m.f. method based on the concentration cell principle.
 - Give brief account of homogeneous and heterogeneous catalysis. Explain what are catalytic poisons.
 - Write the mechanism and applications of Beckmann Rearrangement.
 - What will be the percentage extraction of vanadium (v) with mesityl oxide if volume of organic phase is 10ml, volume of aqueous phase is 10ml and distribution ratio is 1247?
- Q.2** a. Write a note on streaming potential. How is it related to zeta potential? 05
- b. Calculate transport number of H^+ ions and Cl^- ions from the following data obtained by moving boundary method using cadmium chloride as indicator electrolyte: 05
- concentration of HCl solution = 0.2 N
 - Mass of silver deposited in the coulometer = 0.14g
 - movement of boundary = 8.7cm
 - Cross section of tube = 0.62cm^2
 - Equivalent weight of silver = 108
- c. Explain the principle and technique of gas chromatography. Write any two applications of GC in detail. 05
- d. Write a note on separation of lanthanides by Ion Exchange method. 05
- Q.3** a. Discuss with illustrations the origin of an electric charge on a colloid 05
- b. Write preparation of following compounds from malonic ester. 05
- Cyclopentane carboxylic acid
 - cinnamic acid
- c. Give the basic requirement of IR radiation absorption. Give any two applications of IR spectroscopy. 05
- d. Which are the three basic methods used in liquid-liquid extraction. Describe any one method in detail. 05
- Q.4** a. Predict the product of following reactions and write name and mechanism of the reaction 05



- b. What is spectrophotometry? Discuss the principle and working of UV-visible spectrophotometry with an example 05
- c. Write a short note on electrophoresis 05
- d. Discuss aromaticity of furan 05
- Q.5** a. Discuss activation energy concept with respect to catalysis. Discuss in brief the adsorption theory of catalysis. 05
- b. Explain why pyridine is more basic than pyrrole 05
- c. Define and explain the terms: 05
- i. Specific conductance
 - ii. Equivalent conductance
 - iii. Molar conductance
- d. Explain spin-spin interaction of NMR signal for the following compounds: 05
- i. $\text{CH}_3-\text{CH}_2-\text{CHO}$
 - ii. $\text{CH}_3\text{CH}_2\text{OH}$
- Q.6** a. Write a short note on Quinhydrone electrode. 05
- b. Write a note on Paal-Knorr synthesis of pyrrole. 05
- c. What is flame photometry? Write the principle, instrumentation and application of flame photometry. 05
- d. Explain briefly the desalination process by Ion-exchange method. 05
