



**WEST BENGAL STATE UNIVERSITY**  
B.Sc. Honours 4th Semester Supplementary Examination, 2021

**CEMACOR10T-CHEMISTRY (CC10)**

**ORGANIC CHEMISTRY**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

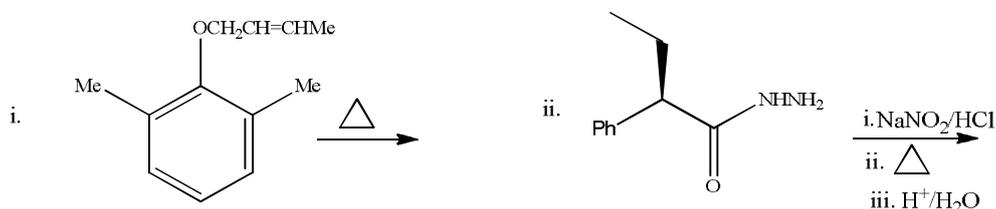
**Answer any four questions taking one from each unit**

**UNIT-I**

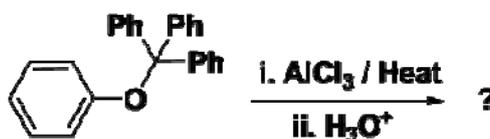
1. (a) What is Mannich base? 2
- (b) Convert aniline to benzene. 2
- (c) State the action of  $\text{NaNO}_2 / \text{HCl}$  on: 1+1
  - (i) N-methylaniline
  - (ii) N, N-dimethylaniline
  
2. (a) How we can generate carbene from diazo methane? 2
- (b) Write short notes on NEF Carbonyl synthesis. 2
- (c) Convert: Phenol  $\longrightarrow$  *p*-aminophenol 2

**UNIT-II**

3. (a) "In the Arndt-Eistert synthesis two equivalent of diazomethane is used." — Explain the statement showing mechanism of the reaction. 2
- (b) Predict the products in the following reactions and formulate plausible mechanism for their formation. 2+2



- (c) Explain the following rearrangement reaction in terms of thermodynamically and kinetically control product? 2



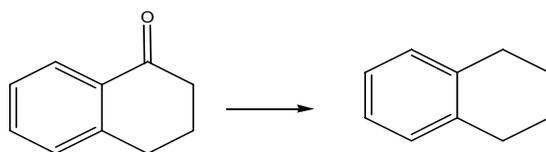


## UNIT-IV

7. (a) How can you distinguish between anisole and *p*-cresol by UV spectroscopy? 2  
 (b) Calculate  $\lambda_{\max}$  values for the following compounds using Woodward Fieser rule. 2+2



- (c) Why carbonyl stretching frequency in acetone is lower than that in acetyl chloride? 2  
 (d) Write down different types of stretching and bending vibrations. 2+2  
 (e) A compound  $C_4H_6O_2$  shows a very strong IR band at  $1720\text{ cm}^{-1}$  and only one singlet signal in its  $^1\text{H NMR}$  spectrum. Analyze the compound. 3  
 (f) Distinguish *o*-hydroxy benzaldehyde and *p*-hydroxy benzaldehyde by IR spectroscopy. 1
8. (a) A compound of molecular formula  $C_6H_{12}O$  shows a very strong IR band at  $1705\text{ cm}^{-1}$  and two singlet signals at  $\delta$  2.1 and 1.2 in its  $^1\text{H NMR}$  spectrum. Analyze the compound. 3  
 (b) Differentiate between *o*-dinitrobenzene and *p*-dinitrobenzene by  $^1\text{H NMR}$  spectra. 2  
 (c) How can you distinguish between cyclohexanone and cyclopentanone by IR spectroscopy? 2  
 (d) The position of UV absorption maxima of aniline in aqueous solution are different from those of benzene but are almost identical with those of benzene in a solution of  $\text{pH} = 1$ . 2  
 (e) Between *cis*-stilbene and *trans*-stilbene, which one will absorb at longer wavelength and why? 2  
 (f) How do you monitor the completion of the below reaction by IR spectroscopy? 2



- (g) Draw  $^1\text{H NMR}$  signals of  $\text{CH}_3\text{CH}_2\text{OH}$  showing the relative chemical shifts, integration and spin-spin coupling pattern. 3

**N.B. :** Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.

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