



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

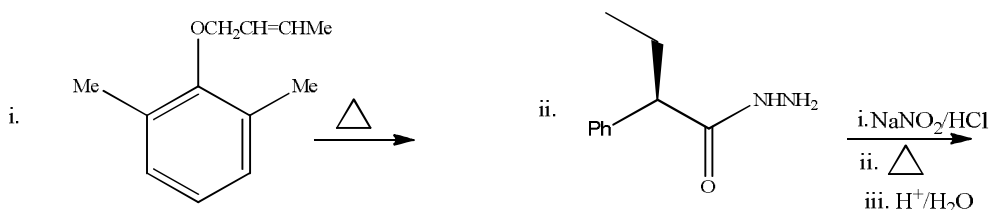
UNIT-I

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

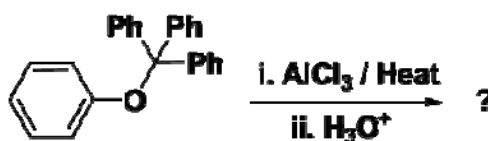
2. (a) How we can generate carbene from diazo methane? 2
- (b) Write short notes on NEF Carbonyl synthesis. 2
- (c) Convert: Phenol \longrightarrow *p*-aminophenol 2

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

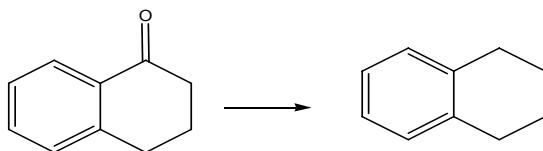


UNIT-IV

7. (a) How can you distinguish between anisole and *p*-cresol by UV spectroscopy? 2
 (b) Calculate λ_{\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 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 cm^{-1} and two singlet signals at δ 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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