

Seat No.	
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M.Sc. (Part - II) (Semester - III) (CBCS)
Examination, March - 2023
ORGANIC CHEMISTRY
Organic Reaction Mechanism (Paper - IX)
Sub. Code : 80474/85415

Day and Date : Wednesday, 21 - 06 - 2023

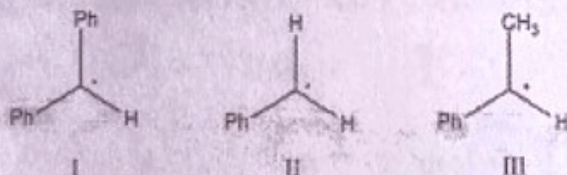
Total Marks : 80

Time : 10.30 a.m. to 01.30 p.m.

- Instructions :
- 1) All questions carries equal marks.
 - 2) Attempt in all five questions.
 - 3) Question No. 1 is compulsory.
 - 4) Select any two questions from each section I and section II.
 - 5) Figures to the right indicate full marks.
 - 6) Use of log table and calculator is allowed.

Q1) a) Answer the following (One Mark Each): [16]

- i) What is kinetic isotope effect?
- ii) Define ENE reaction.
- iii) What is ylide?
- iv) Arrange the following free radicals according to their increase in stability.



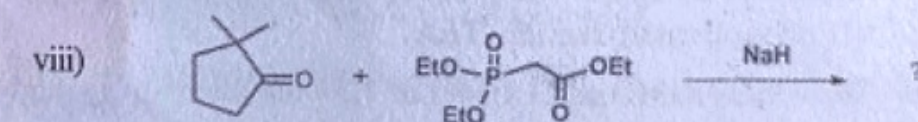
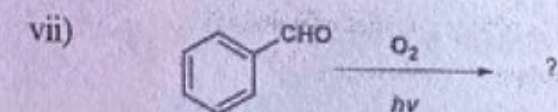
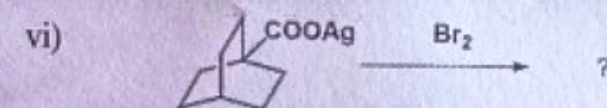
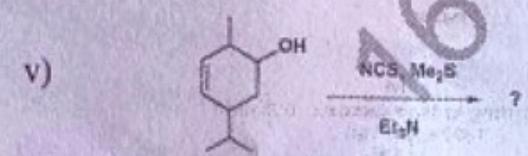
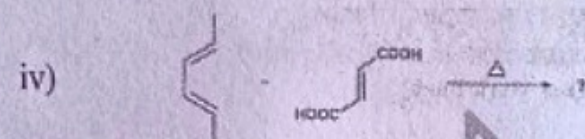
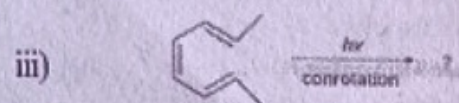
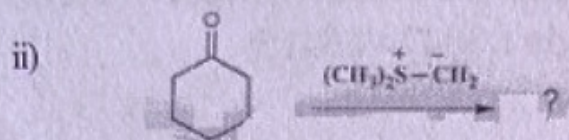
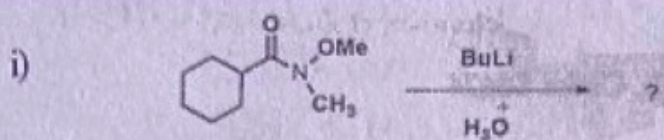
- v) Name the reaction that is used to convert an alcohol into aldehyde or ketone using N - Chlorosuccinimide (NCS), dimethyl sulfide (DMS) and triethylamine (TEA).
- vi) Draw the HOMO and LUMO of 1,3 - butadiene in ground state.
- vii) Give any two radical initiators.
- viii) Give the catalysts most commonly used in the alkyne metathesis reaction.

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(2022-23)

M.Sc. II
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(Repeater)

b) Predict the products in the following reactions



SECTION - I

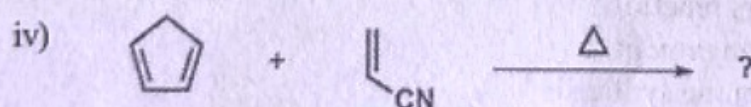
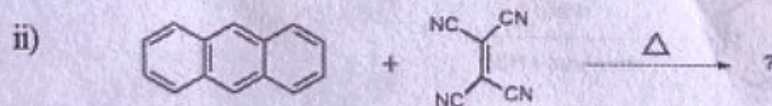
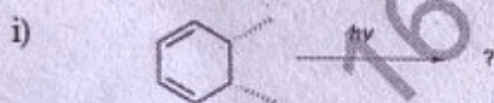
Q2) Explain the use of the following methods in determining the mechanism of reaction. [16]

- Trapping of the intermediates
- Reaction catalysis
- Cross-over experiments
- Stereochemical studies

Q3) a) Explain the characteristics of pericyclic reactions. Derive Woodward-Hoffmann rules for conversion of butadiene into cyclobutene using FMO approach. [8]

b) Explain the correlation diagram for [4+2] cycloaddition reaction. [8]

Q4) a) Write the necessary selection rule and give stereochemistry of the product for each of the following pericyclic reactions. [8]



b) State and explain Hammett equation and explain the significance of substituent constant (σ) and reaction constant (ρ) [8]

SECTION - II

Q5) a) Give an account of the methods of preparation and synthetic utility of sulfur ylides. [8]

b) Explain the following reactions with mechanism [8]

i) Petasis reaction

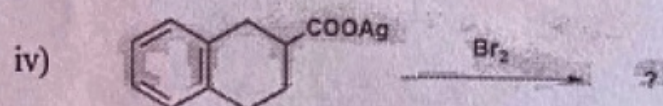
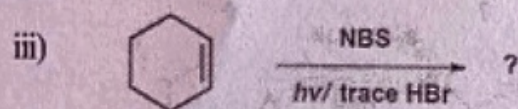
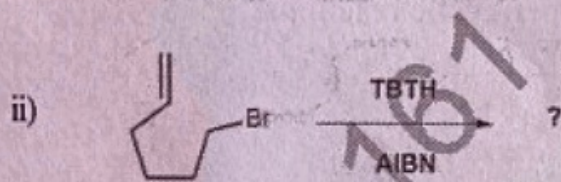
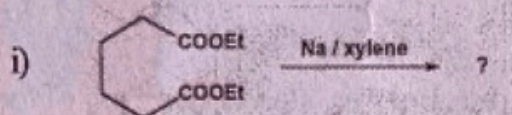
ii) Henry reaction

Q6) a) Explain the following reactions giving mechanism [8]

i) Abstraction reactions

ii) Hunsdiecker reaction

b) Write the products of the following reactions giving mechanism. [8]



Q7) Write notes on (any four):

[16]

- Sandmeyer's reaction
- Cope rearrangement
- Weinreb ketone synthesis
- Isotopic labelling
- Phosphorus ylides

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