This question paper contains **4** printed pages]

WT—124—2024

FACULTY OF SCIENCE & TECHNOLOGY

M.Sc. (First Year) (Second Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(CBCS/New Pattern)

CHEMISTRY

Paper–CH-422

(Organic Chemistry-II)

(Friday, 13-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. *:—* (*i*) Attempt *all* questions.

(*ii*) Figures to the right indicate full mark.

1. Attempt any *three* of the following : 15

(*a*) Explain Arenium ion mechanism with suitable example.

(*b*) Explain Wittig reaction. Give its mechanism how would you synthesis

$$C_6H_5 - CH = CH - CH_3$$

(*c*) Explain the stereochemistry of electrocyclic pericyclic reaction for 4π system under heat by FMO method.

P.T.O.

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(*d*) What is Photochemistry ? Explain the Norrish type-I and II reactions with example.

(*e*) Why on thermal reaction cis 3, 4 dimethyl cyclobutene gives (2E, 4Z), 2, 4 hexadiene while trans isomer gives the (2E, 4E) 2, 4 hexadiene ?

2. Attempt any *three* of the following : 15

(*a*) What is photofries reaction ? Explain the photofries reaction of anilides with suitable example.

(*b*) Draw correlation diagram for $(4\pi + 2)$ cycloaddition reaction and explain why it is thermally allowed and photochemically symmetry forbidden.

(*c*) Define sigmatropic rearrangement. Explain Azacope rearrangement with mechanism.

(*d*) Cis-butene on addition of bromine gives *dl*-mixture of 2, 3 dibromobutane.

(*e*) Explain the effect of substrates and leaving group in aliphatic electrophilic substitution reaction.

3. (*a*) Explain the following reactions with mechanism : 7

(*i*) Micheal reaction

(*ii*) Mannich reaction.

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Or

What is photoreduction ? Explain the photoreduction of Benzophenone with mechanism.

(*b*) Explain the 1, 3 dipolar cycloaddition and chelotropic reactions with mechanism. 8

Or

Explain with mechanism :

(*i*) IPSO substitution reaction

(*ii*) Vilsmeir reaction.

4. (*a*) With the help of FMO and correlation diagram method explain interconversion of 1, 3 butadiene into cyclobutene under thermal and photochemical condition. 7

Or

Explain the Paterno-Buchi reaction with suitable example and its stereo-chemistry.

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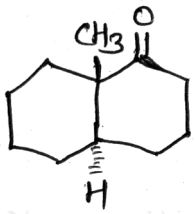
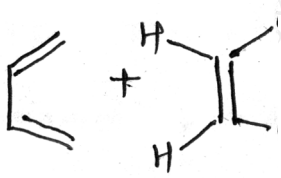
(*b*) Predict the products with mechanism of the following (any *four*) : 8

(*i*)  $\xrightarrow[H_{202}/OH^-]{THF}$?

(*ii*)  $+ C_6H_5 - \underset{\displaystyle CH_3}{\underset{|}{N}} - CHO \xrightarrow{POCl_3}$

(*iii*)  $\xrightarrow{hr}$?

(*iv*)  $\xrightarrow{\Delta}$?

(*v*) $(C_6H_5)_2CO + Ph - C \equiv C - Ph \xrightarrow{h\upsilon}$?

(*vi*)  $\xrightarrow[2.\ KOH/\Delta]{1.\ KCN/EtOH}$?

5. Write short notes on the following (any *three*) : 15

(*a*) [3, 3] sigmatropic rearrangement

(*b*) Stobbe reaction

(*c*) Sharpless epoxidation

(*d*) Ortho-para ratio

(*e*) Photochemistry of Vision.

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