

**A-1002**

**Total Pages : 3**

**Roll No. ....**

**CHE-551**

**Reaction Mechanism, Pericyclic Reaction,**

**Photochemistry, Stereochemistry**

**M.Sc. Chemistry (MSCCH)**

**Examination 2026 (Feb.)**

**Time: 02:00 hrs**

**Max. Marks: 70**

Note : This paper is of Seventy (70) marks divided in to two (02) Section A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. *Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.*

**Section-“A”**

**(Long Answer - type Questions)**

Note:- Section ‘A’ contains Five (05) long-answer-type questions of Nineteen (19) marks each. Learners are required to answer any two (02) questions only.

**(2x19=38)**

**P.T.O**

**A-1002**

1. What is the Reactive intermediate? Give the method of formation of carbene. Discuss the factors that affect the stability of Carbene.
2. Discuss the photochemical cleavage of carbonyl compounds with the help of the Norrish type-I and Norrish type-II.
3. (a) Discuss the boat conformation of cyclohexane. Why is the boat conformation of cyclohexane less stable than the chair conformation?  
(b) Discuss the photochemical reactions of diazo compounds.
4. Discuss the mechanism of any two of the following:  
(a) Wagner-Meerwein Rearrangement  
(b) Looser rearrangement.  
(c) Pinacole-Pinacolone Rearrangement
5. What are the elimination reactions? Discuss the mechanism of the E1 and E2 reactions with the help of their stereochemistry.

### **Section-“B”**

#### **(Short -answer - type questions)**

**Note:- Section ‘B’ contains eight (08) short-answer type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only.**

**(4x8=32)**

1. Draw the Jablonski diagram. With the help of the Jablonski diagram, describe, deactivation of excited states.
2. Discuss the conformations of 1,2-methyl cyclohexane and 1,3-methyl cyclohexane.
3. Define cycloaddition reaction. What are [m + n] cycloadditions? Explain with two examples.
4. Discuss Woodward and Hoffmann's explanation for conservation of molecular orbital symmetry.
5. Discuss the mechanism of the following:
  - (a) Baeyer-Villiger oxidation
  - (b) Hoffmann Rearrangement.
6. Why is the staggered conformation of ethane more stable than the eclipsed conformation?
7. What is  $\pi - \pi^*$  transition? Draw the HOMO and LUMO molecular orbital diagram of 1, 3- butadiene and ethylene.
8. Give the mechanism of the following reaction:
  - (a) Ene reaction
  - (b) Photo-smiles rearrangement

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