A–884

Total Pages : 5 **Roll No. .....**

CHE–551

M.Sc. CHEMISTRY (MSCCH)

(Reaction Mechanism, Pericyclic Reaction, Photochemistry Stereochemistry)

2nd Year Examination, 2024 (June)

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections '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 2×19=38

***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.

1. (a) What are Chelotropic reactions and how is it related to Diel-Adler's additions.

   (b) How is Claisen rearrangement related to Cope rearrangement ? Give some examples of Claisen rearrangement.

2. Write a short note on :

   (a) Cyclopropanation reaction

   (b) Hofmann rule

   (c) Kinetic isotope effect

   (d) Phosphorescence

   (e) Vibrational cascade

3. (a) State Curtin-Hammett principle and explain with suitable examples.

   (b) Define cycloaddition reactions. What are $(m + n)$ cycloadditions ?

   (c) Discuss the boat conformation of cyclohexane. Why is the boat conformation of cyclohexane less stable then the chair conformation ?

4. Explain the following :

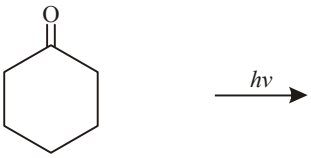
   (a) Why staggered conformation of ethane is more stable than eclipsed conformation ?

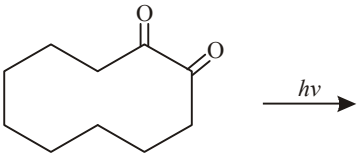
(b) Mechanism of E_2 and E_1 Cb reaction in detail.

(c) Jablonski diagram.

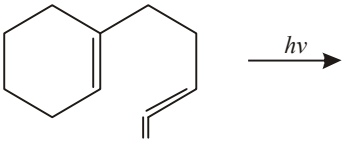
(d) Photochemistry of Alkenes and dienes in detail.

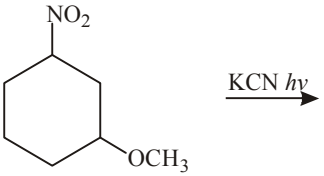
5. Complete the following reactions :

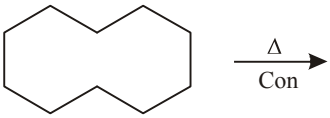
(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

Section–B

Short Answer Type Questions 4×8=32

***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.

1. Explain the different conformation of cyclohexane.
2. Discuss the Woodward and Hoffmann's explanation for conservation of molecular orbital symmetry.
3. Discuss the mechanism of E_1 reaction. Explain orientation of double bond in β elimination reaction.
4. Explain the following :
   (a) Curtins rearrangement
   (b) Photochemistry of azo compounds
5. Discuss the mechanism of any *two* of the followings :
   (a) Wagner-Meerwein Rearrangement
   (b) Hoffmann Rearrangement
   (c) Pinacole-Pinacolone Rearrangement
   (d) Claisen Rearrangement
6. Explain symmetry in π molecular orbitals of allylic system.

7. With the help of FMO method discuses selection rules for 1, 3 butadiene cyclobutene system under thermal and photo-chemical conditions.

8. Write notes on the followings.

   (i) 1, 5 supraficial shift of a group with retention of configuration.

   (ii) Fries rearrangement

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