A–0998

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MCH-606

M.Sc. Chemistry (MSCCH)

Photochemistry and Stereochemistry

Examination February, 2026

Time : 2:00 Hrs. Max. Marks : 35

Note* :–** This paper is of Thirty Five (35) 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) (2×9½=19)

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nine and Half (9½) marks each. Learners are required to answer any *two* (02) questions only.

1. Explain any two from the following :

   (a) Di-π Methane rearrangement

   (b) Photo-Smiles rearrangement

   (c) Barton reaction

2. Explain the Norrish type-I and Norrish type-II cleavage in the photochemical reaction of carbonyl compounds.

3. (a) Discuss briefly the conformations of Methyl cyclohexane.

   (b) Explain Photochemistry of Alkenes and dienes in detail.

4. Explain the following :

   (a) Effects of conformation on the reactivity of organic compounds

   (b) Mechanism of Paterno-Buchi reaction

5. (a) Discuss photochemistry of 1, 3-butadiene

   (b) Discuss stereochemistry of pyrolytic reaction

Section–B

(Short Answer Type Questions) (4×4=16)

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Four (04) marks each. Learners are required to answer any *four* (04) questions only.

1. Explain why chair conformation of cyclohexane is more stable than boat conformation.
2. Write note on photochemistry of conjugated dienes.
3. Discuss the boat conformation of cyclohexane. Why is the boat conformation of cyclohexane less stable than the chair conformation ?
4. Discuss the photochemistry of the following :
   (a) Diazo compounds
   (b) Azides
5. Explain the conformation of monosubstituted cyclohexane and disubstituted cyclohexane.
6. Write notes on any two from the following :
   (a) Cycloaddition and cyclodimerization reaction
   (b) Cis-trans isomerization in alkene
   (c) Photo induced electrophilic substitution reaction of benzene
7. Write notes on the any two from the following :
   (a) Electronic transitions
   (b) Photosensitization
   (c) Phosphorescence
8. Explain briefly the photochemistry of peroxides.

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