

**A-0550**

**Total Pages : 3**

**Roll No. ....**

**MSCCH-502**

**M.Sc. CHEMISTRY (MSCCH)**

**(Organic Chemistry-I)**

**1st Semester Examination, Session December 2024**

**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. Discuss in detail the various methods employed to determine reaction mechanisms.
2. Discuss the stereochemistry and configurations of spiranes in detail.
3. Define anti-aromaticity and explain how it differs from aromaticity and homo-aromaticity.
4. Discuss Cram's rule and Prelog's rule in detail, explaining their role in predicting the stereochemical outcomes of reactions involving chiral centers
5. Discuss the conformations of cyclohexane and how the chair, boat, and twist-boat conformations differ in terms of geometry and energy.

### 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 concepts of conjugation and cross-conjugation in organic molecules, highlighting their structural, electronic, and chemical characteristics.

2. What is prochirality, and how does it differ from chirality ? Give an example of a prochiral molecule and explain how it can be converted into a chiral molecule.
3. Discuss the nature, formation, and reactivity of nitrene reactive intermediate.
4. What is stereoselectivity in a chemical reaction ? Provide an example of a reaction where one stereoisomer is preferred over others.
5. Briefly explain the reaction mechanisms of elimination reaction.
6. What is a Sawhorse projection, and how does it differ from a Fischer projection in representing the 3D arrangement of atoms in a molecule.
7. Define the R, S. system of nomenclature, and how is it used to describe the configuration of chiral centers in molecules ?
8. What is hyperconjugation, and how does it influence the stability of carbocations and free radicals ?

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