A–0405

Total Pages : 3 **Roll No. .....**

MSCCH-502

M.SC. (CHEMISTRY) (MSCCH)

(Organic Chemistry-I)

Examination, June 2025

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 Ssections 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 the derivation of the Hammett equation, starting from the concept of substituent effects on reaction constants.
2. Discuss the stereochemistry and configurations of biphenyls in detail.
3. Explain Hückel's rule and its application to determining aromaticity. Discuss the conditions required for a compound to be aromatic, antiaromatic, and homoaromatic.
4. Define absolute and relative configurations in stereochemistry and discuss their determination with sutable eamples.
5. Explain the concept of configuration in cyclohexane and substituted cyclohexanes.

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 Hammond's postulate in detail and its significance in understanding reaction mechanisms.
2. What is resonance and how does it affect the stability of molecules ?

3. Discuss the nature, formation, and reactivity of carbene reactive intermediate.

4. Briefly explain the reaction mechanisms of Nucleophilic substitution reaction.

5. What is a Fischer projection, and how is it used to represent stereochemistry in molecules ? Illustrate with an example of a chiral molecule.

6. Define stereoselectivity and stereospecificity in organic reactions. Provide examples of reactions that demonstrate stereoselectivity and stereospecificity.

7. What is chirality ? Explain the criteria for a molecule to be chiral, and provide an example of a chiral compound.

8. What is the D, L system of nomenclature, and how is it used to describe the configuration of sugars and amino acids ?

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