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MSCCH-502

Organic Chemistry-I

M.Sc. Chemistry (MSCCH)

1st Semester Examination, 2023 (June)

Time : 2 Hours] **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 answer 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.

(2×19=38)

1. What is hyperconjugation ? How this effect is helpful to explain the following properties ?

(a) Structural stability.

(b) Reactivity.

(c) Dipole moment.

2. Write note on :

(a) Hammond's postulates.

(b) Curtin-Hammett principle.

3. Answer the following questions :

(a) Define prochirality with example.

(b) Demonstrate that the two faces of formaldehyde are homotopic.

(c) Write note on stereochemistry and configuration of Adamantane and biphenyls.

4. With the help of π molecular orbital of annulenes. Explain why annulenes having $(4n + 2)$ π electrons are more stable than the one containing $(4n)$ π electrons.

5. How will you distinguish between singlet and triplet carbenes based on their stability and stereochemical behaviour in addition reactions.

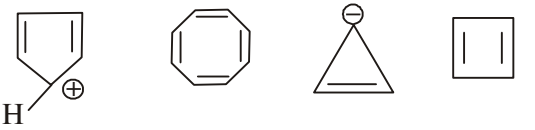
SECTION–B
(Short Answer Type Questions)

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. (4×8=32)

1. Discuss aromaticity of heterocyclic compounds.

2. Describe in brief the absolute configuration.

3. Discuss the type of aromaticity in the following organic compounds



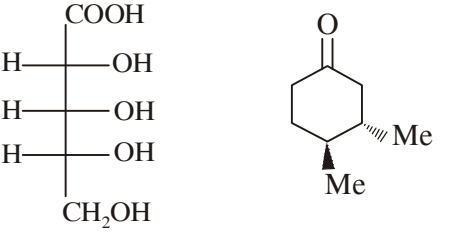
4. List the factors that determine the stability of carbocation

5. Sketch the structure and decide whether the following compounds are enantiomers or distereomers

(a) (E)-1,2-dichloroethene and (Z)-1,2-dichloroethene

(b) (+) tartaric acid and mesotartaric acid

6. Assign the absolute configuration R or S to each chiral centre in the following compounds



7. Give the order of stability with suitable reason for the following carbanion :

Cyclopentadienyl, cyclopentyl, allyl, benzyl

8. Explain Cram's rule with suitable example.
