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

MSCCH-502

Organic Chemistry-I

M.Sc. Chemistry (MSCCH-21)

1st Semester Examination, 2022 (June)

Time : 2 Hours] **Max. Marks : 80**

Note : This paper is of Eighty (80) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

SECTION–A

(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Twenty (20) marks each. Learners are required to answer any Two (02) questions only.

(2×20=40)

1. Write the short note on the following :

(a) Huckel's rule.

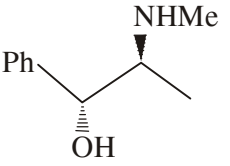
(b) Inclusion Compounds.

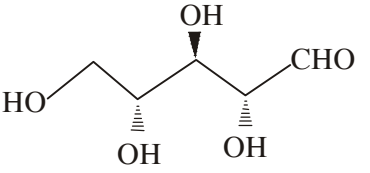
(c) Annulenes.

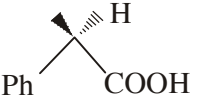
(d) Hyper conjugation. 20

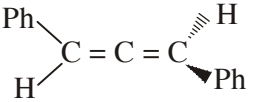
2. Derive the Hammett equation to correlate the substituent and reaction constant. 20

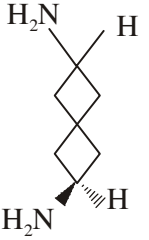
3. Assign the absolute configuration R or S to each chiral centre in the following compounds.

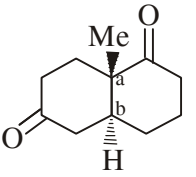
(a) 

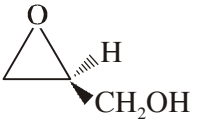
(b) 

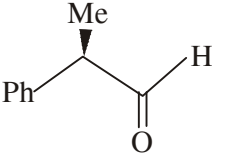
(c) 

(d) 

(e) 

(f) 

(g) 

(h) 

4. Write brief note on :

(a) Application of isotopic tracers in determination of reaction mechanism.

(b) Isotopic labelling.

(c) Stability of singlet and triplet carbene. 20

5. What are carbocations? Write note on :

(a) Formation of carbocations.

(b) Stability of carbocations.

(c) Reactions of carbocations.

(d) Structure of carbocations.

SECTION–B

(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Ten (10) marks each. Learners are required to answer any Four (04) questions only. (4×10=40)

1. Explain the terms aromaticity, antiaromaticity and homoaromaticity. 10

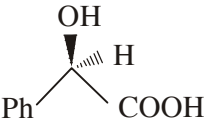
2. Write short note on :

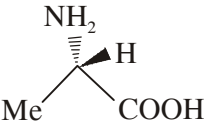
(a) Hammond's postulate.

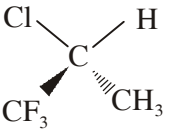
(b) Stability of carbanion. 10

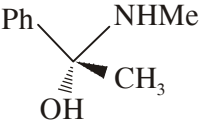
3. With suitable examples, discuss briefly the stereochemistry of sulphur and phosphorus compounds. 10

4. Convert the following flying wedge formula into the corresponding fisher projection formula.

(a) 

(b) 

(c) 

(d) 

10

5. Explain the following :

(a) Topicity and prochirality.

(b) Cram's rule. 10

6. With suitable examples, explain the terms homotopic enantiotopic and diastereotopic groups. 10

7. Explain why :

(a) Singlet dichlorocarbene is more stable than the triplet carbene.

(b) Trimethyl cyclopropenyl cation in more stable than triphenylcyclopropenyl cation. 10

8. Explain briefly :

(a) Spiranes.

(b) Atropisomerism. 10