

DSPM UNIVERSITY, RANCHI
END SEMESTER EXAMINATION-2020
M.Sc. SEMESTER-IV
Model Question Paper-Core Course 9

Sub – Synthetic Organic Chemistry
Paper – CC9

Time – 2 Hour
Total Marks – 70

Section-A

Answer any three questions.

1. Unlike the conrotatory thermal ring opening and closure in 2,4-hexadiene \leftrightarrow dimethylcyclobutene interconversion, in 1,3,5-hexatrienes \leftrightarrow cyclohexadienes interconversions the reactions are thermally disrotatory and not conrotatory. Explain. **10**
2. On heating 3-deuterioindene, scrambling of the label to all the three positions in the five membered ring takes place. Explain. **10**
3. Write mechanism and one synthetic use of the following reactions:
(a) Paterno-Büchi reaction
(b) Di- π methane rearrangement **2 x 5**
4. Discuss Sharpless asymmetric epoxidation of allylic alcohols with mechanism and Stereochemistry of product. **10**
5. Write mechanism and one synthetic use of the following reactions:
(a) Oppenauer oxidation
(b) Dress-Martin periodinane **2 x 5**
6. (a) Discuss stereochemical features of Claisen and Cope rearrangements.
(b) Write mechanism of Mislow-Evans rearrangement. **2 x 5**

Section-B

Answer any two questions.

7. (a) Draw π -MO diagram of 1,3-butadiene, 1,3,5-hexatriene and pentadienyl radical. Discuss their symmetry properties under C_2 axis and σ plane.
(b) Why *cis*-3,4-dimethylcyclobutene on heating gives *cis,trans*-2,4-hexadiene, while on photochemical reaction the product is *trans,trans*-2,4-hexadiene? Explain. **2 x 10**
8. Explain any two of the following reactions with mechanism and synthetic uses.
(a) Nazarov reaction
(b) Aza-Claisen rearrangement
(c) Ireland-Claisen rearrangement **2 x 10**
9. What do you mean by photorearrangements of unsaturated ketones? Discuss photorearrangement of 2,5-cyclohexadienones with detail mechanism. **20**

10. (a) Discuss Prevost and Woodward dihydroxylation with mechanism and stereochemistry of products.
- (b) Maleic acid on reaction with OsO_4 and H_2O_2 gives tartaric acid which is optically inactive and no optically active enantiomers can ever be obtained from it. Explain briefly.

2 x 10

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MODEL QUESTION PAPER