

Exam. Code : 210403

Subject Code : 4939

M.Sc. Chemistry 3rd Semester (Batch 2020-22)

ORGANIC SYNTHESIS

Paper : Course—XVII

Time Allowed—3 Hours] [Maximum Marks—50

Note :—Attempt FIVE questions in all, selecting at least ONE question from each section. The fifth question may be attempted from any section. All questions carry equal marks.

SECTION—A

1. (a) Discuss mechanism of Beckmann Rearrangement with suitable examples and special emphasis on migration. How the harsh reaction conditions can be overcome ?
- (b) Give synthetic applications of Beckmann rearrangement. 6,4
2. (a) What are the synthetic applications of Shapiro reaction ? What is the importance of migratory aptitude in achieving desired products via Shapiro reaction ?
- (b) Discuss the mechanism of Arndt-Eistert synthesis. Outline the similarities between Curtius and Schmidt rearrangement. 5,5

SECTION—B

3. (a) Preorganization is not very important to achieve balanced complexation-decomplexation? Justify.
(b) Discuss with examples the difference between cryptands, spherands and crown ethers.
(c) What are the limitations of Guanidinium based hosts for detection of anions? 3,5,2
4. (a) Enlist the various difficulties involved in the synthesis of polynuclear compounds. Discuss two methods for the synthesis of catenoids. 4
(b) Discuss and compare the aromatic character of fluorene and phenanthrene. Give two methods of synthesis of civiton. 3,3

SECTION—C

5. (a) Discuss various principles of cycloaddition reaction.
(b) Discuss two reactions given by thietanes. Compare their reactivity with oxetanes.
(c) Give two methods of synthesis of thiepinines. 3,4,3
6. (a) Give three methods of synthesis of coumarins. Which one will you prefer to use and why?
(b) Give two rearrangement reactions of dioxocines leading to the formation of unexpected products. 4,6

SECTION—D

7. (a) Discuss the applications of the following reagents in organic transformations. Give examples also :
(i) LDA
(ii) DCC
(iii) Metal hydrides. 2,2,3
(b) What are the advantages and limitations of phase transfer catalysis? 3
8. (a) Discuss with examples the synthetic utility of Woodward and Prevost hydroxylation and Peterson's synthesis.
(b) Enlist various parameters/reaction conditions which should be taken care of before using selenium dioxide.
(c) Despite its great efficiency, tri-n-butyltin hydride is not commonly used. Why? 4,3,3