

M.Sc.(Chem.) Semester - 3 (CBCS) Examination

Oct/Nov-2022 (NEW COURSE)

Advanced Organic Chemistry (Core (New))

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1 (a) Answer the following

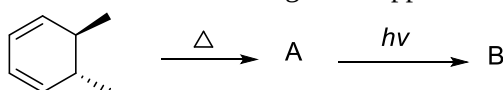
04

- (1) Explain con rotation and dis rotation of FMO with one example each.
- (2) Discuss HOMO, LUMO and symmetry criteria for allylic carbocation under thermal and photochemical reaction conditions.

Q.1 (b) Answer any two question out of three.

10

- (1) What is FMO theory? Write the products (A & B) of the following reaction and discuss mechanism using FMO approach.

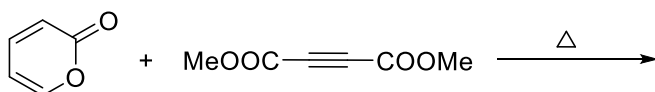


- (2) What is conservation of Molecular orbital theory? Explain with one example
- (3) What is PMO theory? Discuss electrocyclization of 1,3,5-hexatriene system using PMO theory.

Q.2 (a) Answer the following

04

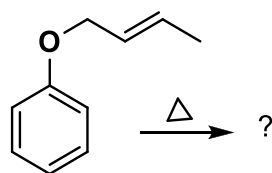
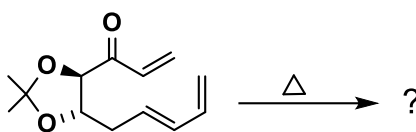
- (1) What is chelotropic reaction? Explain with one example.
- (2) Write the product of following reaction with mechanism:



Q.2 (b) Answer any two question out of three.

10

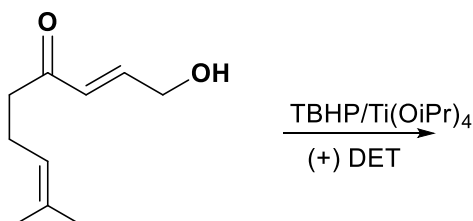
- (1) Discuss cheletropic reaction with three examples.
- (2) Explain Retro Diels-alder reaction with mechanism using suitable examples.
- (3) Identify the following reactions and write their products with mechanism:



Q.3 (a) Answer the following

04

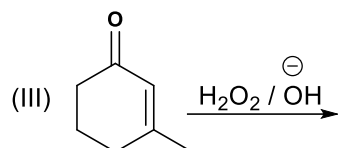
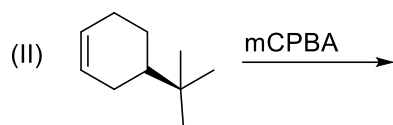
- (1) Discuss any two methods for the epoxide synthesis.
- (2) Write the appropriate product of following reaction with mechanism.



Q.3 (b) Answer any two questions out of three.

10

- (1) What is chiral auxiliary? Describe the asymmetric synthesis of amino acid using suitable chiral auxiliary.
- (2) Write the appropriate product of following reactions sequence (I & II) with mechanism:



- (3) Write a note on Nooyori reaction.

Q.4 (a) Answer the following

04

- (1) What are alkaloids? Give classification.
- (2) Draw the following structure of alkaloid and Enlist their importance: (a) Ricinine (b) Quinine

Q.4 (b) Answer any two questions out of three.

10

Describe the total synthesis of following alkaloids:

- (1) Codeine
- (2) Atropine
- (3) Reserpine

Q.5 (a) Answer the following

04

- (1) Provide the chemical structure and name of any four Nucleosides.
- (2) Write the full form and chemical structures of (a) AMP (b) ATP

Q.5 (b) Answer any two questions out of three.

10

Describe the total synthesis of following natural product:

- (1) Adenosine
- (2) Theophylline
- (3) 2'-deoxyguanosine
