

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

Nov/Dec-2023 (NEW COURSE)

Advanced Organic Chemistry (Core (New))

Time: 2:30 Hours

Marks: 70

Instructions:

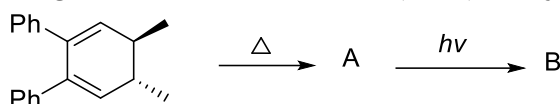
1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1(A) Answer the following. (04)

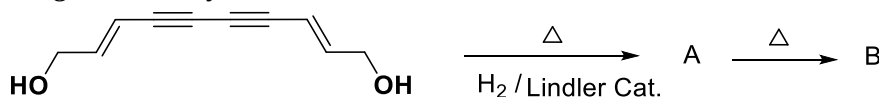
- 1) Why pericyclic reaction is also known as concerted reaction? Explain with example.
- 2) Discuss HOMO, LUMO and symmetry criteria for butadiene system under thermal and photochemical reaction conditions.

Que.1(B) Answer any two question out of three. (10)

- 1) Predict the products (A & B) of the following reaction and discuss mechanism using Frontier Molecular Orbital (FMO) theory:



- 2) Predict the products (A & B) for the following reaction and discuss mechanism using FMO theory.



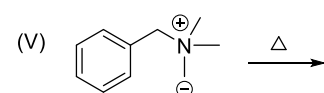
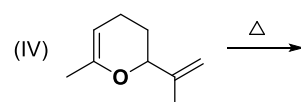
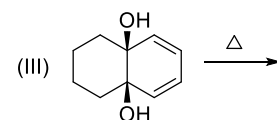
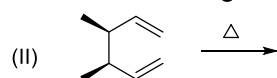
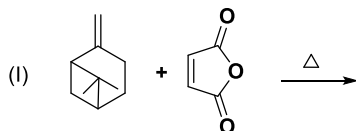
- 3) Discuss electrocyclization of following dienes using PMO theory:
(A) 2E,4E-hexadiene (B) 2E,4Z-hexadiene

Que.2(A) Answer the following. (04)

- 1) Give two examples of each: (a) Click reaction (b) Chelotropic reaction

Que.2(B) Answer any two question out of three. (10)

- 1) Why cycloaddition reaction of cyclopentadiene with acrylaldehyde is endo-selective? Explain with mechanism.
- 2) Explain Retro Diels-alder reaction with mechanism using suitable examples.
- 3) Identify the following reactions (I to V), and write their corresponding product.

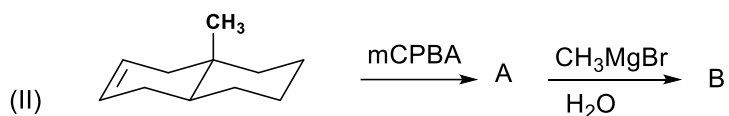
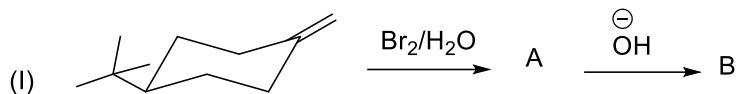


Que.3(A) Answer the following. (04)

- 1) Discuss stereoselective Sharpless epoxidation with example.

Que.3(B) Answer any two question out of three. (10)

- 1) What is chiral auxiliary? Describe application of Evans oxazolidinones auxiliary in the asymmetric synthesis of carboxylic acid.
- 2) Write the appropriate product of following reactions sequence (I & II) with mechanism:



- 3) Give structure of Corey-Bakshi-Shibata (CBS) reagent and describe its application in stereoselective synthesis with mechanism

Que.4(A) Answer the following. (04)

- 1) What are alkaloids? Give classification and enlist their importance.

Que.4(B) Answer any two question out of three. (10)

Describe the total synthesis of any one alkaloid from following group:

- 1) Quinoline
- 2) Pyrolidine
- 3) Tropane

Que.5(A) Answer the following. (04)

- 1) Provide the chemical structure and name of any four Nucleosides.

Que.5(B) Answer any two question out of three. (10)

Describe the total synthesis of following natural product:

- 1) 2'-deoxyadenosine
- 2) Theophylline
- 3) 6-aminopurine
