

M.Sc.(Chem.) Semester - 3 (CBCS) Examination
DEC/JAN. - 2020 - [NEW COURSE]
Advanced Organic Chemistry(Core (New))

Time: 1:30 Hours

Marks: 42

Instructions:

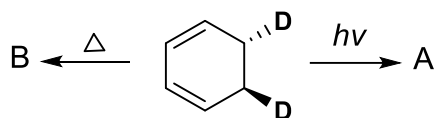
1. Figure to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Q.1 (a) Answer the following**4**

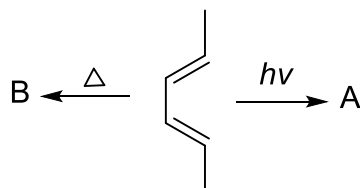
- (1) Give one examples of each: (a) Electrocyclic reaction (b) Sigmatropic shift
- (2) Discuss HOMO, LUMO and symmetry criteria for molecular orbitals (MO) of 1,3,5-hexatriene under thermal and photochemical reaction condition.

Q.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 Woodward-Hoffmann correlation diagram.



- (3) Describe Mobius-Huckel theory for pericyclic reaction.

Q.2 (a) Answer the following**4**

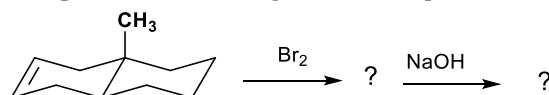
- (1) Give four examples of each: (a) Dine (b) 1,3 -Dipoles
- (2) Why [2+2] cycloaddition reaction of ethylene with ketene is thermally allowed? Explain with example.

Q.2 (b) Answer any two question out of three.**10**

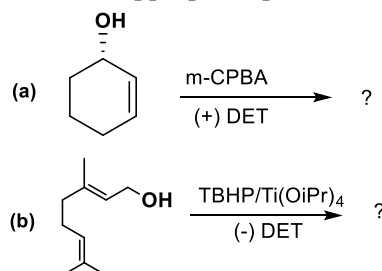
- (1) Explain pseudo-ortho and para selectivity of Diels-alder reactions using appropriate examples.
- (2) Write a note on [3,3] sigmatropic cope rearrangement.
- (3) Describe Claisen sigmatropic shift with suitable examples.

Q.3 (a) Answer the following**4**

- (1) Complete the following reaction sequence and justify your answer



- (2) Write the appropriate product of following reaction and justify your answer



- Q.3 (b) Answer any two question out of three. 10**
- (1) Explain asymmetric epoxidation using m-CPBA and Henbest effect with example.
 - (2) Discuss any two Asymmetric ring opening reaction of epoxides with mechanism.
 - (3) What is chiral auxiliary? Describe asymmetric aldol reaction using Evans oxazolidinones auxiliary.
- Q.4 (a) Answer the following 4**
- (1) Define Alkaloid and provide structure of any two alkaloids.
 - (2) Enlist importance of Quinine and draw its structure
- Q.4 (b) Answer any two question out of three. 10**
- Describe the total synthesis of following natural product:
- (1) Codeine
 - (2) Atropine.
 - (3) Quinine
- Q.5 (a) Answer the following 4**
- (1) Provide the structure and name of DNA bases.
 - (2) What will be the product of Controlled hydrolysis of nucleic acids?
- Q.5 (b) Answer any two question out of three. 10**
- Describe the total synthesis of following natural product:
- (1) Guanosine
 - (2) Theophylline
 - (3) Uric acid.
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