



Seat No. : _____

NG-138

November-2025

M.Sc., Sem.-III

CHE (O) 502 : Organic Chemistry (Advanced Organic Synthesis)

Time : 2:30 Hours]

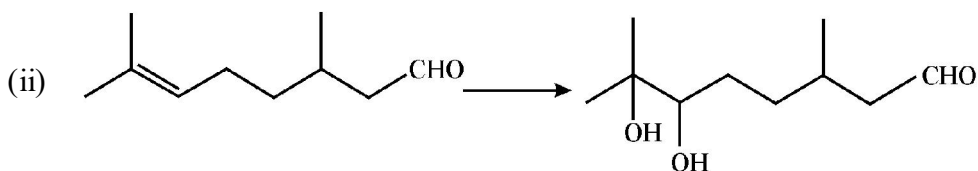
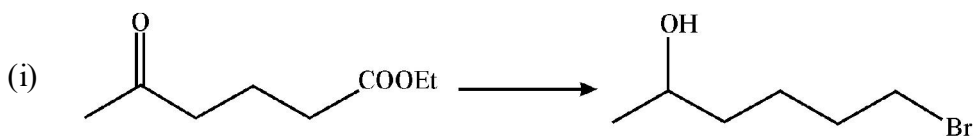
[Max. Marks : 70

- Instructions :** (1) All questions are compulsory.
(2) Figures to right indicate full marks.

1. (A) With the help of correlation diagram and PMO method, show in detail that the Diels-Alder reaction is thermally allowed process. 7
1. (B) Explain the ring inversion of Cyclohexane in detail. 7

OR

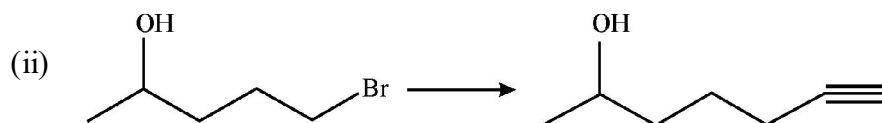
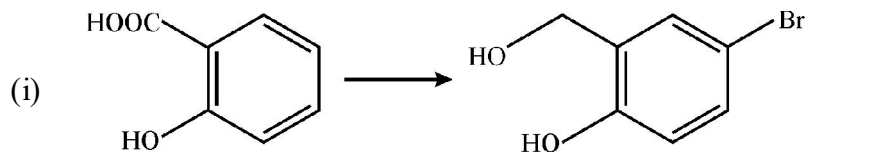
1. (A) Define the term conrotatory and disrotatory motions. With the help of correlation diagram, analyse the cis-3, 4-dimethylcyclobutene \rightleftharpoons 2, 4-hexadiene system, giving stereochemistry under thermal and photochemical conditions. 7
1. (B) Discuss the use of FMO method to predict the course of sigmatropic rearrangement. 7
2. (A) Discuss methods for protection of alcohols and phenols with suitable examples. 7
2. (B) Complete the following reaction using suitable protecting group. 7



OR

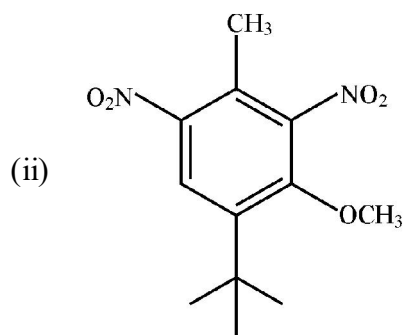
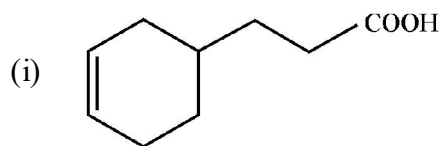
2. (A) Give the name of protecting groups with structure for the protection of amines and discuss any three in detail. 7

2. (B) Complete the following reaction using suitable protecting group : 7



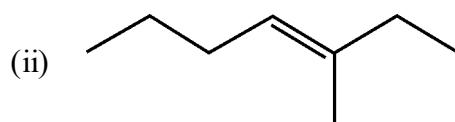
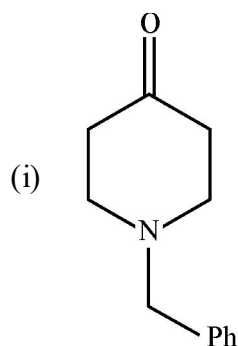
3. (A) Explain guidelines for the order of event in retrosynthesis with suitable examples. 7

3. (B) Do the disconnection and give synthesis of the following molecules : 7

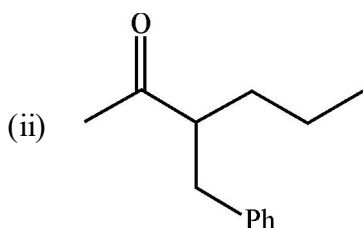
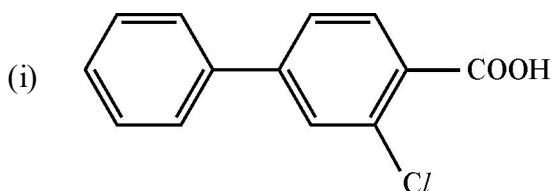


OR

3. (A) Do the disconnection and give synthesis of the following molecules : 7



3. (B) Do the disconnection and give synthesis of the following molecules : 7



4. (A) Giving mechanism of reaction, discuss oxidation of alkenes to corresponding diols and carbonyl compounds. 7

4. (B) Discuss mechanism for the following reactions with one application of each :

(i) Clemmensen Reduction

(ii) Wolff-Kishner Reduction 7

OR

4. (A) Discuss the reduction of epoxides, oximes, and nitro compounds. 7

4. (B) Giving mechanism, discuss the applications of Jones's reagent and Corey's reagent in organic synthesis. 7

5. Attempt any **seven** out of **twelve** : 14

(1) Trans-cis-trans-1, 3, 5-octatriene $\xrightarrow{\Delta}$?

(2) Define suprafacial and antarafacial addition.

(3) Draw a structure of cis-trans-cis-perhydroanthracene conformer and say whether it is optically active or not.

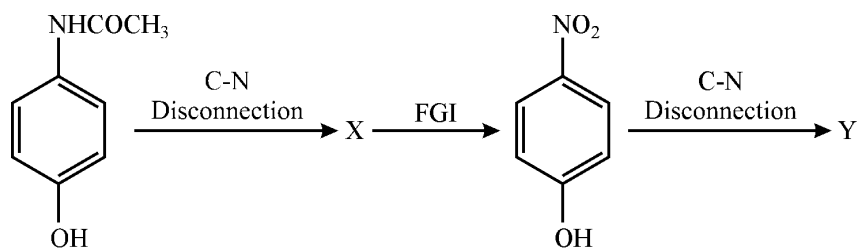
(4) Define electrocyclic reaction giving one example.

(5) Give the structure and application of Fmoc and THP.

(6) Give name and structure of two reagents utilize for protection of carboxylic acid.

(7) Define illogical electrophile with one example.

(8) Give X and Y for given C-N disconnection



(9) Define synthon and synthetic equivalent with example.

(10) Give two examples of reduction reaction by metal hydride.

(11) Define Swern oxidation with one application.

(12) Give structure and application of Collin's reagent.
