

**ZA-103**

April-2014

M.Sc. (Sem.-IV)

**CHE(O) 507 : Organic Chemistry**

Time : 3 Hours]

[Max. Marks : 70

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

1. (A) What are pericyclic reactions ? Discuss classification of pericyclic reactions with suitable example of each sub divisions. 7

**OR**

Discuss the correlation diagram method for interconversion of cyclobutene-butadiene and show that in controtatory mode it is thermally allowed and in disrotatory mode it is photochemically allowed.

- (B) Discuss the correlation diagram method for [4s + 2s] type cycloaddition reaction between 1, 3-butadiene and ethane in detail. 7

**OR**

What is the full form of FMO method ? Using FMO method, show that the [1, 5] sigmatropic shift of hydrogen in 1, 3-pentadiene is suprafacially allowed under thermally condition and antarafacially allowed under photochemical condition.

2. (A) Draw projections and discuss conformational analysis of both 1, 3-dimethylcyclohexane and 1, 4-dimethylcyclohexane. 7

**OR**

Discuss the conformational analysis of perhydrophenanthrene in detail.

- (B) Give ONLY list of factors that affect the stability of conformations. Draw projections and discuss various conformations of decalines. 7

**OR**

Giving suitable example compare the conformational analysis of heterocyclic compounds with carbocyclic compounds.

3. (A) Enlist oxidizing agent for the oxidation of alkene. Discuss any two such oxidizing agents with suitable reaction mechanism. 7

**OR**

What is oxidation ? Giving mechanism, discuss any two different reagents used for oxidation of aldehydes.

- (B) What is oxidation ? Giving mechanism, discuss the application of Peroxy carboxylic acid in epoxidation of various alkenes. 7

**OR**

Answer the following **two** :

- (i) Explain the use of periodate ion in the oxidation of glycols with mechanism.  
(ii) Explain the oxidation of aromatic ring of phenol.

4. (A) What is reduction ? Giving evidences discuss the mechanism for the reduction of alkynes. 7

**OR**

Enlist methods for the reduction of carbonyl compounds. Discuss at least two methods for reduction of carbonyl compounds with relevant mechanism.

- (B) Discuss the reduction of naphthalene and aromatic nitro compounds under different conditions. 7

**OR**

Giving evidences discuss the mechanism for the reduction of esters to alcohols and amides to amines.

5. Answer the following in brief : (14)

- (A) Answer in brief : 4

- (1) What is node pericyclic reactions ?  
(2) What is conrotation in the context of electrocyclic reaction ?  
(3) What is the full form of PMO theory ?  
(4) Why pericyclic reactions are known as NO Mechanism reactions ?

- (B) Answer in brief : 3

- (5) What are conformational isomers ?  
(6) What is angle strain ?  
(7) Why gauche form of ethylene glycol is more stable than anti form ?

- (C) Answer in brief : 4

- (8) Give one example of stereo selective oxidation of C-H bond.  
(9) Give one application of m-chloro perbenzoic acid as an oxidizing agent.  
(10) Give one application of DMSO as an oxidizing agent.  
(11) Name the reagent which oxidizes primary, secondary and tertiary amines.

- (D) Answer in brief : 3

- (12) How alkenes are reduced to alkanes ?  
(13) Give one example of reduction of benzene.  
(14) How alcohols are reduced to hydrocarbons ?
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