

Seat No. : \_\_\_\_\_

**AA-111**

**April-2016**

**M.Sc., Sem.-IV**

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

**(Advanced Organic Chemistry)**

**Time : 3 Hours]**

**[Max. Marks : 70**

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

1. Answer the following :

- (a) Define the term : Conrotatory and disrotatory system. With co-relation diagram of conrotatory system explain cyclisation of 1, 3, 5-hexatriene to cyclohexadiene. **7**

**OR**

Define the term : Suprafacial and antarafacial cycloaddition. Construct co-relation diagram for (4S+2S) cycloaddition and reverse reaction and show that they are thermally allowed and photochemically forbidden process.

- (b) What is FMO method ? Discuss the application of FMO method to predict the course of electrocyclic and cycloaddition reaction. Derive selection rules. **7**

**OR**

Explain Sigmatropic rearrangement with suitable example. Discuss the application of PMO method to predict the course of sigmatropic reaction.

2. Answer the following :

- (a) What are conformational isomers ? Discuss Bayer's strain theory for cyclic aliphatic hydrocarbons. **7**

**OR**

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

- (b) Draw projections and discuss various conformations of decalines and decalones. 7

**OR**

- (i) 1, 2-Dimethyl cyclobutane exists as two isomers: cis and trans. Why cis is more stable ?
- (ii) Why cis-4-tert butyl cyclohexanol undergoes elimination reactions faster than trans ?

3. Answer the following :

- (a) Giving mechanism discuss the application of Osmium tetroxide and Manganese dioxide as oxidizing agent in organic synthesis. 7

**OR**

Enlist oxidizing agents for the oxidation of alkene. Giving mechanism discuss the application of peroxy carboxylic acid in epoxidation of various alkenes.

- (b) Giving examples explain oxidation reaction. Discuss the oxidation of alcohols with suitable mechanism. 7

**OR**

- (i) Discuss the application of  $\text{PdCl}_2$  as an oxidising agent.
- (ii) Discuss the oxidation of aromatic ring of phenol.

4. Answer the following :

- (a) Enlist methods for the reduction of carbonyl compounds. Discuss at least two methods for reduction of carbonyl compounds with relevant mechanism. 7

**OR**

Giving evidences discuss the mechanism for the reduction of alkynes.

- (b) Giving reagent and condition discuss mechanism for the reduction of various aromatic nitro compounds. 7

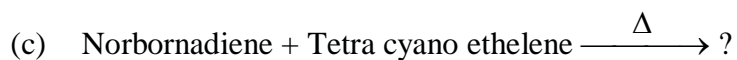
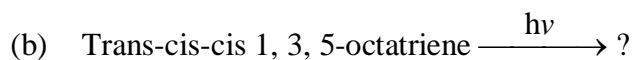
**OR**

Discuss mechanism for the following reactions :

- (i) Rosenmund reduction
- (ii) Staudinger reduction
- (iii) Wolff Kishner reduction

5. Answer the following :

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(d) Give symmetry properties of 1, 3-butadiene.

(e) Define Bredt's rule.

(f) Draw various isomers of Dichlorocyclopropane.

(g) Arrange following Cycloalkanes in ascending order based on heat of combustion and ring strain :

Cyclopentane, Cyclopentadecane, Cyclodecane and Cyclopropane

(h) Draw newmann projection of the most stable conformation of cis-1-ethyl-4-isopropyl cyclohexane.

(i) What is sharpless epoxidation ?

(j) How PCC (Pyridinium Chloro Chromate) is prepared ?

(k) Give sequential steps for the conversion of anisole to 2-cyclohexenone.

(l) How alcohols are reduced to hydrocarbon ?

(m) What is the advantage of Wilkinson's catalyst in reduction reactions ?

(n) What is homogenous and heterogeneous catalytic hydrogenation ?

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