

Seat No. : _____

ML-129

March-2019

M.Sc., Sem.-IV

**507 : Organic Chemistry
(Advance Organic Chemistry)**

Time : 2:30 Hours]

[Max. Marks : 70

Instruction : All questions are compulsory.

1. (A) Answer the following :

(i) What are Pericyclic reactions ? Classify them. Derive selection Rule for $(4n\pi)$ and $(4n + 2)\pi$ electron system with the help of FMO method for cycloaddition reaction. 7

(ii) Define the term Conrotatory and Disrotatory system with Correlation diagram of Conrotatory system. Explain Cyclisation of 1, 3, 5-Hexatriene to Cyclohexadiene. 7

OR

(i) What is Dewar's Rule of aromaticity ? Discuss it's application to predict electrocyclic and sigmatropic reactions. Derive selection Rule.

(ii) Discuss the Correlation diagram method for $(4S + 2S)$ type Cycloaddition reaction between 1, 3-Butadiene and ethane.

(B) Answer the following : (any **four**) 4

(i) Write symmetric properties of 1, 3, 5-Hexadiene.

(ii) Trans Cis 1, 3, 5-Octatriene $\xrightarrow{h\nu}$

(iii) Define Bredt's Rule.

(iv) Give symmetric properties of 1, 3-Butadiene.

(v) Define Suprafacial and Antarafacial addition.

(vi) Nor Bornadiene + Tetracyanoethylene $\xrightarrow{\Delta}$

2. (A) Answer the following :
- (i) What are Conformational Isomers ? Discuss Bayer's strain theory for cyclic aliphatic hydrocarbons. 7
 - (ii) Draw projections and discuss conformational analysis of both 1, 3-diethyl cyclohexane and 1, 4-dimethylcyclohexane. 7

OR

- (i) Draw projections and discuss various Conformational analysis of heterocyclic compounds with carbocyclic compounds.
 - (ii) Draw projections and discuss various confirmations of Decalines and Decalones.
- (B) Answer the following : (any **four**) 4
- (i) Draw Newmann Projection of the most stable Confirmation of Cis-1, 1 ethyl -4-Isopropyl Cyclohexane.
 - (ii) Draw various isomers of Dichloro Cyclopropane.
 - (iii) Arrange following Cycloalkanes in ascending order based on heat of combustion and ringstrain :
Cyclopentane, Cyclopentadecane, Cyclodecane, Cyclopropagane.
 - (iv) Draw structures for the cis and trans isomers of Cyclobutane.
 - (v) What are Conformational Isomers ?
 - (vi) What is angle Strain ?

3. (A) Answer the following :
- (i) Giving mechanism of reaction and discuss oxidation of alkenes to corresponding diols and carbonil compounds. 7
 - (ii) Giving mechanism of reaction. Discuss the Specificity of Chromic Acid as an oxidising agent for the oxidation of alcohol. 7

OR

- (i) Giving the mechanism and discuss application of OsO_4 and HIO_4 .
- (ii) Giving the mechanism and discuss application of SeO_2 and DMSO.

- (B) Answer the following : (any **three**) **3**
- (i) Give one example of Stereoselective Oxidation of C-H bond.
 - (ii) Give one application of DMSO as an oxidising agent.
 - (iii) Name the reagent which oxidises primary, secondary and tertiary amines.
 - (iv) What is Sharpless Epoxidation ?
 - (v) What is Collins Reagent ?

4. (A) Answer the following :
- (i) Giving evidence discuss the mechanism for the reduction of alkenes. **7**
 - (ii) Discuss mechanism for the following reactions with one application each : **7**
 - (1) Staudinger Reduction
 - (2) Luche Reduction

OR

- (i) Discuss mechanism for the following reactions with one application each
 - (1) Woolf-Kishner Reduction
 - (2) Rosenmud Reduction
 - (ii) Giving evidence discuss the mechanism for the reduction of alkynes.
- (B) Answer the following : (any **three**) **3**
- (i) Give one example of reduction of Benzene.
 - (ii) How alcohols are reduce to hydrocarbon ?
 - (iii) How alkenes are reduce to alkanes ?
 - (iv) What is the advantage of Wilkinson's catalyst in reduction reaction ?
 - (v) What is Rosenmud catalyst ?
-

