



FC-144001 Seat No. _____

M. Sc. (Sem. IV) Examination

June / July - 2021

MSC0C401 : Organic Chemistry

(Advanced Organic Chemistry) (Old Course)

Time : 2 Hours]

[Total Marks : 50

- Instructions :**
- (1) Answer only **three (3)** questions.
 - (2) The examination will be for **two (02)** hours.
 - (3) Q. No. **9** is **compulsory** and carries **14** marks.
 - (4) Answer any **two** questions from questions No. **1** to **8**. Each question carries **18** marks.

1 Answer the following

- (1) Giving classification, discuss the characteristic of pericyclic reaction. Construct the correlation diagram for (2S+2S) cycloaddition reaction and show that they are thermally forbidden while photochemically allowed process.
- (2) Define the term: Conrotatory and disrotatory system. With co-relation diagram of conrotatory system explain cyclisation of 1,3,5 hexatriene to cyclohexadiene.

2 Answer the following

- (1) Construct the correlation diagram of interconversion of cyclobutene-butadiene and show that in conrotatory mode it is thermally allowed while in disrotatory mode it is thermally forbidden process. Discuss selection rules.
- (2) What is the full form of FMO method? Using FMO method, shows that the (1,5) sigmatropic shift of hydrogen in 1,3-pentadiene is suprafacially allowed under thermally condition and antarafacially allowed under photochemical condition.

3 Answer the following

- (1) What are conformational isomers? Discuss Bayer's strain theory for cyclic aliphatic hydrocarbons.
- (2) Draw projections and various conformations of decalines and decalones.

4 Answer the following

- (1) Discuss the conformational analysis of Perhydrophenanthrene in details.
- (2) Draw projection and discuss various conformational analysis of heterocyclic compounds with carbocyclic compounds.

5 Answer the following

- (1) Giving mechanism of the reaction, discuss the reactivity and specificity of chromic acid as an oxidizing agent.
- (2) What is oxidation? Giving mechanism discuss any two different reagents used for oxidation of aldehydes.

6 Answer the following

- (1) Discuss the application of periodic acid and Mn(VII) as oxidizing agent in organic synthesis.
- (2) What is epoxidation? Giving mechanism, discuss the application of Peroxy Carboxylic acid in epoxidation of various alkenes.

7 Answer the following

- (1) Enlist methods for the reduction of carbonyl compounds. Discuss at least two methods for reduction of carbonyl compounds with relevant mechanism.
- (2) Discuss the reduction of naphthalene and aromatic nitro compounds under different conditions.

8 Answer the following

- (1) Giving evidences, discuss the mechanism for the reduction of alkynes.
- (2) Giving evidences discuss the mechanism for the reduction of esters to alcohols and amides to amines.

9 Answer the following in brief:

14

- (1) What is the full form of PMO theory?
 - (2) Cyclopentadiene + Maleic anhydride $\xrightarrow{\Delta}$
 - (3) Cis-2 butene(s) + Cis-2 butane(a) \longrightarrow
 - (4) What is conrotation in the context of electrocyclic reaction?
 - (5) What is angle strain?
 - (6) Why gauche forms of ethylene glycol is more stable than anti form?
 - (7) Draw newmann projection of the most stable conformation of cis-1-ethyl-4-isopropyl cyclohexene.
 - (8) Show per iodinate oxidation of primary alcohol.
 - (9) What is sharpless epoxidation?
 - (10) How PCC (Pyridinium ChloroChromate) is prepared?
 - (11) What is Collins reagents?
 - (12) Give one example of stereo selective oxidation of C-H bond.
 - (13) What is the advantage of Wilkinson's catalyst in reduction reaction?
 - (14) What is homogenous and heterogeneous catalytic hydrogenation?
-