

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 03

Total No. of Questions : 11

M.Sc (Chemistry) (Sem.-3)
ADVANCED ORGANIC CHEMISTRY-I
Subject Code : CHL-502-18
M.Code : 76679
Date of Examination: 14-12-2022

Time : 3 Hrs.

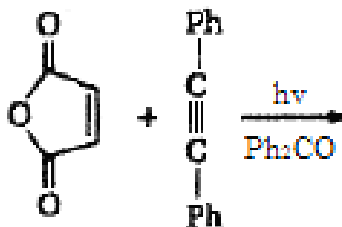
Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains EIGHT questions carrying FIVE marks each and students have to attempt any SIX questions.
3. SECTION-C will comprise of two compulsory questions with internal choice in both these questions. Each question carries TEN marks.

SECTION-A

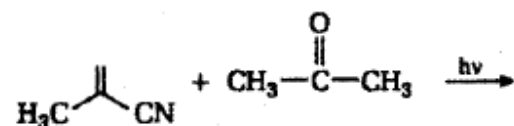
1. a) Only UV-visible region of light can produce chemical change, while other regions are not so effective. Why?
b) Complete the following:



- c) Sketch the π -molecular orbitals of 1,3-butadiene and 1,3,5-hexatriene.
- d) What criteria should be fulfilled by the compound to become sensitizer?
- e) Write a note on conrotatory and disrotatory motion.
- f) What is oxetane?
- g) What is quantum yield?

h) What is photodegradation of polymer?

i) Predict the product :



j) What are singlet molecular oxygen reactions?

SECTION - B

2. With the help of FMO method and PMO method, show that [2 + 2] cycloaddition reaction is photochemically allowed reaction.
3. a) Give the mechanism of the chelotropic cycloaddition reactions between (i) alkene and carbene (ii) alkene and SO₂.
b) Analyse 1,3 dipolar cycloaddition reaction based on FMO method?
4. Show both conrotatory processes for the thermal electrocyclic conversion of (2E, 4E)-2,4-hexadiene into 3,4-dimethylcyclobutene. Explain why the two processes are equally alike.
5. How one can account for the opposite stereochemistry in the photochemical cyclisation of a 1,3-butadiene to a cyclobutene than the thermal reaction?
6. What is Barton reaction? Discuss with examples?
7. Discuss Molecular Orbital Symmetry and Classification of Pericyclic Reactions.
8. Discuss Frontier Molecular Orbital (F.M.O.) method of analysing cyclic addition reactions. Derive selection rules for cyclic addition reactions.
9. Describe the photochemistry of aromatic compounds in isomerizations and substitutions.

SECTION-C

10. a) What is cope rearrangement? Explain with example.

b) What are different types of photochemical reactions?

OR

What are thermally allowed cycloaddition reaction? Discuss in terms of FMO approach for cycloaddition reactions.

11. What are electrocyclization reactions? Discuss with examples.

OR

a) What is Norrish type-II reaction? Discuss with examples.

b) What is Photo Fries rearrangement? Discuss its mechanism.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.