

M-33/2110

10473/N

**PHOTOCHEMISTRY AND PERICYCLIC REACTIONS-321
(SEMESTER-3rd)
(Syll-Dec-2019)**

**Maximum Marks: 55
Time allowed: 3 Hours**

Note: Attempt any four questions. All questions carry equal marks.

Q. 1 (a) Describe the various types of Photochemical Excitations which are the possible in organic molecule. Also discuss the "Allowed" and "Forbidden" Excitations.

7 marks

(b). What do you mean by Photosensitization? Discuss this phenomenon with the help of suitable examples.

6.75 marks

Q. 2 (a) Describe the Low Temperature Photochemistry by taking appropriate examples.

9 marks

(b). Define the terms "Fluorescence" and "Phosphorescence" with the help of suitable diagram.

4.75 marks

Q. 3 (a) Describe the mechanism of Photoreduction of Carbonyl compounds with the help of appropriate examples.

6.75 marks

(b). How will you obtain Oxetane by using the [2+2] cycloaddition reactions of carbonyl compounds. Give your answer with the help of examples.

7 marks

Q. 4 (a) Describe the mechanism of photocycloaddition reactions of conjugated enones. Elaborate your answer with suitable examples.

7 marks

(b). Discuss the [2+2] cycloaddition reactions of Alkenes with Conjugated dienes.

6.75 marks

Q. 5 (a) How would you achieve *cis-trans* isomerization of alkenes under photochemical condition? Provide your answer with suitable examples and mechanisms.

7 marks

(b). Discuss the photochemistry of cyclobutanones with the help of appropriate examples.

6.75 marks

- Q. 6 (a) Discuss the photorearrangements of 2,4-cyclohexadienones by considering suitable examples. **6.75 marks**
(b). Describe the photo α -cleavage reactions of ketones by taking appropriate examples. **7 marks**
- Q. 7 How will you analyze the following reactions on the basis of FMO approach:
(a) Cheletropic Reactions **7 marks**
(b). Peripatetic Cyclopropane Bridge **6.75 marks**
- Q. 8 (a) What do you mean by “Degenerate Cope Rearrangements” and “Fluxional Molecules”?
Provide your answer by taking suitable reactions in each case. **7 marks**
- (b). Define the Electrocyclic Reactions. Explain the role of PMO approach upon the analysis of these reactions. **6.75 marks**
- Q. 9 (a) Explain the utility of 1,3-Dipolar Cycloadditions Reactions in the synthesis of five membered heterocycles with suitable examples. **6 marks**
(b) Describe the products and mechanism of reaction when 5-phenyl-hexan-2-one is photoirradiated in dry hexane as the solvent. **4 marks**
(c). Describe the mechanisms of “Group Transfer” and “Group Elimination” Reactions by taking examples in each case. **3.75 marks**

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