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[Roll No.]

CHE-551

**M.Sc. (Chemistry) IInd Year
Examination Dec., 2023**

**REACTION MECHANISM, PERICYCLIC
REACTION, PHOTOCHEMISTRY
STEREOCHEMISTRY**

Time : 2 Hours]

[Max. Marks : 70

Note :- This paper is of Seventy (70) marks divided into two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given there in. Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section-A

(Long Answer Type Questions) 2×19=38

Note :- Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any two (02) questions only.

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(1)

P.T.O.

1. Discuss the the photochemical cleavage of carbonyl compound with the help of the Norrish type-I and Norrish type-II.
2. Discuss the conformations of cyclohexane, 4-methyl cyclohexane and cyclohexanone
3. What is the carbene ? Give the method of formation of carbene. Discuss the factors which affect the stability of carbene.
4. Discuss the mechanism of any *two* of the following :
 - (a) Baeyer-Villiger oxidation.
 - (b) Hoffmann Rearrangement.
 - (c) Wolf Rearrangement.
 - (d) Curtius Rearrangement.
5. What is Paterno-Buchi reaction ? Discuss its mechanism along with the stereochemical consequences.

Section–B

(Short Answer Type Questions) 4×8=32

Note :- Section ‘B’ contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Discuss any *two* of the following :
 - (a) Hofmann rule.
 - (b) Saytzeff rule.
 - (c) Cis elimination in E2 reaction.
2. Draw the Jablonski diagram. With the help of Jablonski diagram describe, deactivation of excited states.
3. Explain the following :
 - (a) Photochemistry of azo compounds.
 - (b) [3, 3] sigmatropic rearrangement.
4. Explain E1cB mechanism with suitable example. How is E1cB reaction differentiated from E2 reaction?
5. Give the mechanism of the any *two* reaction of the following :
 - (a) Pinacol-pinacolane rearrangement
 - (b) Ene reaction
 - (c) Photo-smiles rearrangement
6. What is reactive intermediate ? Explain the stability of the Carbocation and carbanion.
7. Define cyclo addition reaction. What are [m + n] cycloadditions ? Explain with two examples.

8. What is π - π deg transition ? Draw the HOMO and LUMO molecular orbital diagram of the 1, 3-butadiene and ethylene.
