A–0991

Total Pages : 4 **Roll No. .....**

MSCCH-604

M.Sc. Chemistry (MSCCH)

Photo Chemistry and Allied Chemistry

Examination February, 2026

Time : 2:00 Hrs. 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 therein. ***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.

1. Write notes on the following :

   (a) Flash photolysis

   (b) Frank Condon Principle

   (c) Chemiluminiscence (6,6,7)

2. (a) Discuss the Jablonski diagram and its role in understanding photophysical processes. (12)

   (b) Explain the photochemistry of cyclohexanone. (7)

3. Define quantum yield. How is it determined ? Explain with examples of reactions having high and low quantum yields. (19)

4. What are the phase-transfer catalysts ? Discuss the mechanism of phase-transfer catalysis with an appropriate example. Also mention the advantages of phase- transfer catalysis. (19)

5. Write notes on the following :

   (a) Hoffmann-Loeffler-Freytag reaction

   (b) Photo Fries rearrangements

   (c) Norrish Type II (6,6,7)

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.

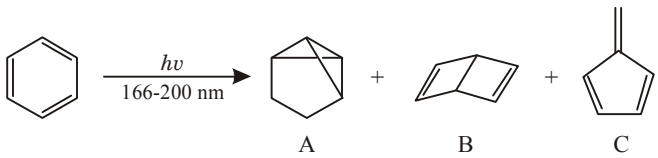
1. Discuss the photochemistry of α, β-unsaturated ketones with suitable examples.

2. Discuss di-π-methane rearrangement and give its mechanism.

3. 1, 3, 5-trimethyl benzene on irradiation with UV-light give 1, 2, 4-trimethyl benzene. Give mechanism of this transformation.

4. Discuss the chemistry of photoaddition reaction between benzene and alkenes.

5. Irradiation of benzene yields a mixture of three products (A), (B) and (C)

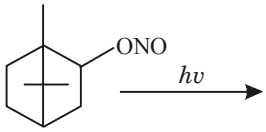


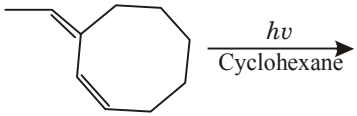
Propose a suitable mechanism for this transformation.

6. Describe photochemical isomerization of alkenes with suitable examples.

7. Discuss four 'R' s of green chemistry.

8. Complete the following reactions with mechanism :

(i) 

(ii) 

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