

**THIRD SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2025**  
(Regular/Improvement/Supplementary)

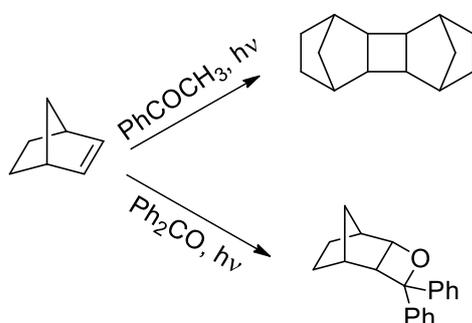
**CHEMISTRY**  
**FCHE3C11 - PHOTOCHEMISTRY AND PERICYCLIC REACTIONS**

Time: 3 Hours

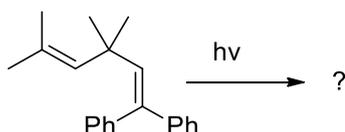
Maximum Weightage: 30

**Section A: Short answer questions. Answer any *eight* questions. Each carries *one* weightage.**

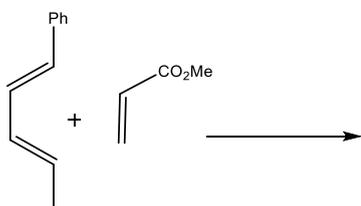
1. Account for the following observations.



2. Complete the given reaction (Hint: Di- $\pi$  methane rearrangement).



3. What happens when anthracene is exposed to UV light? Explain the chemistry.
4. Explain the application of FMO method to study the [2 + 2] cycloaddition reaction.
5. Discuss briefly the classification of steroids.
6. Illustrate two methods for the synthesis of aziridines.
7. What is mutation? How does it affect the life in earth?
8. What do you understand by the term replication?
9. Which is more basic: pyridine or pyrrole? Substantiate your answer.
10. Predict the product and illustrate the mechanism:



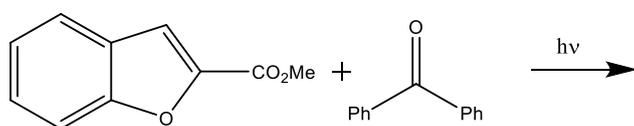
(P.T.O.)

11. Discuss in detail two applications of cathodoluminescence.
12. How will you determine the number of methoxy groups present in atropine?

**(8 × 1 = 8 weightage)**

**Section B: Short essay questions. Answer any four questions. Each carries three weightage.**

13. Giving an example, explain Cope reaction.
14. Derive Stern Volmer Equation.
15. Predict the reaction and arrive at the product:

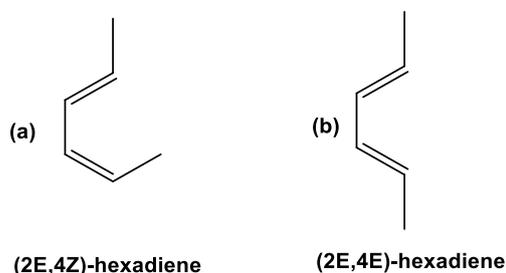


16. Detail the conversion of cholesterol to testosterone.
17. Illustrate an example each with detailed mechanism for the synthesis of 1,2,3-triazole and 1,2,3,4-tetrazole.
18. Explain how protein biosynthesis takes place.
19. Comment on the working of solar cells.

**(4 × 3 = 12 weightage)**

**Section C: Essay questions. Answer any two questions. Each carries five weightage.**

20. Using the FMO method, predict the product with appropriate stereochemistry for electrocyclic ring closure reactions of the following stereo isomers under thermal and photochemical conditions.



21. Discuss in detail the secondary structure of proteins.
22. Illustrate the total synthesis of cephalosporine C.
23. a) Explain the following terms. i) Fluorescence ii) Sensitised fluorescence iii) Quantum yield.  
b) Discuss photoisomerization of substituted benzenes and photodimerization of alkenes.

**(2 × 5 = 10 weightage)**