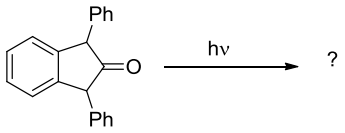
D3ACH1903 **(2 Pages)** **Name.....**
Reg. No.....

THIRD SEMESTER M. Sc. DEGREE EXAMINATION, NOVEMBER 2020
CHEMISTRY
FCHE3C11 - PHOTOCHEMISTRY AND PERICYCLIC REACTIONS

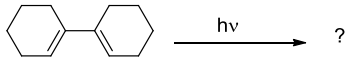
Time: Three Hours **Maximum Weightage: 30**

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

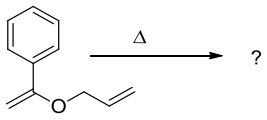
1. Suggest a synthetic method for the preparation of pyrazole.
2. Predict the product in the following reaction.



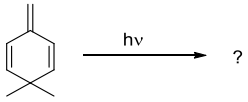
3. Sketch the π-MO diagram of buta-1,3-diene and indicate the HOMO and LUMO.
4. Predict the product in the following reaction.



5. Give the structure of quinine.
6. Draw and label Jablonski diagram.
7. What is meant by thermoluminiscence?
8. Complete the following reaction and give its mechanism.



9. What is meant by photo-Fries rearrangement reaction?
10. Define genetic code.
11. Predict the product in the following reaction.



12. What is meant by oxa di-pi methane rearrangement reaction?

(8 × 1 = 8 weightage)

(P.T.O.)

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

13. Discuss the substituent effects on reactivity and stereochemistry of Diels-Alder reaction.

14. Discuss the following reaction with suitable mechanism.
    (a) [1,3] sigmatropic rearrangement. (b) 1,3 dipolar cycloaddition reactions.

15. (a) Discuss the mechanism of Norrish type 1 reaction.
    (b) The Norrish type 1 process is not important for the photolysis of diaryl ketones. Suggest a reason.

16. What is Paterno-Buchi reaction? Discuss the mechanism along with stereo chemical consequences.

17. Derive Stern-Volmer equation.

18. Discuss the conversion of Cholesterol to testosterone.

19. Give reason for the following (i) Pyrrole is both more acidic and less basic than pyrrolidine. (ii) Imidazole is both more acidic than pyrrole and more basic than pyridine

(4 × 3 = 12 weightage)

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

20. Discuss the photochemical dimerization reaction of anthracene with mechanism using steady state approximation method.
21. What is the structure of cephalosporin C? How do you synthesize it?

22. Suggest a synthetic method towards the preparation of following heterocycles.

    (a) 1,2,4 tetrazoles; (b) 1,2,3 triazole; (c) Oxazole; (d) Pyrazole.

23. (a) Discuss the secondary and tertiary structure of proteins.

    (b) Discuss briefly biosynthesis of protiens.

(2 × 5 = 10 weightage)