



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – CHEMISTRY

THIRD SEMESTER – APRIL 2016

CH 3808 - PHOTOCHEMISTRY AND ORGANIC SYNTHESIS

Date: 25-04-2016
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

Part-A

Answer ALL questions.

(10 x 2= 20)

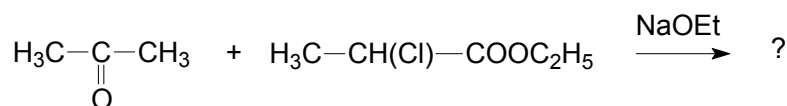
1. What type of compounds undergo 1,2-Michael addition reactions?
2. What is hydroboration reaction? Give an example.
3. Name any two protecting agents for hydroxyl and amine groups.
4. Why is convergent synthesis a better technique than stepwise synthesis?
5. What is the product formed when toluene undergoes Birch reduction?
6. Mention the product formed when 2-butyne is reduced using Lindler's catalyst.
7. State Woodward-Hofmann rules for cycloaddition reaction.
8. What is oxy-Cope rearrangement reaction?
9. What are hot ground state reactions.
10. What is photosensitization? Give an example.

Part-B

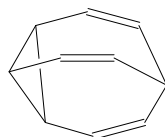
Answer any EIGHT questions.

(8 x 5= 40)

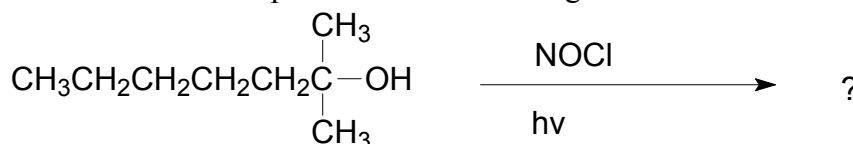
11. Explain the mechanism of Wittig Horner reaction.
12. Identify the product in the following reaction and explain its mechanism.



13. How do carbonyl compounds hold a key position in organic synthesis? Explain it with suitable example.
14. Explain any four guidelines for the C-C disconnections with example.
15. How does FGI play an important role in the retro synthesis of an organic compound?
16. Compare and contrast the Clemmensen and Wolff Kishner reductions with example.
17. How are electro organic oxidation reactions performed? Explain them with two examples.
18. Explain the impact of the substituents on the reactivity of cycloaddition reactions.
19. How is degenerate sigmatropic rearrangement explained in the following compound? Draw at least four structures.



20. Draw the correlation diagram for the electrocyclozation of 1,3-butadiene by dis rotation. Predict whether the reaction is thermally or photochemically allowed.
21. What is Barton reaction? Predict the product in the following reaction.



22. Explain the photochemistry of α,β -unsaturated compounds with at least two examples.

Part-C

Answer any **FOUR** questions.

(4 x 10= 40)

23. Explain the mechanism of following reactions.

(4 + 3 + 3)

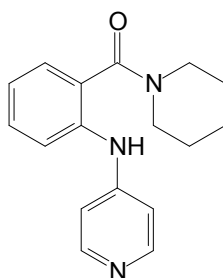
- 1,3-dipolar addition reaction
- Mannich reaction
- Benzoin condensation.

24 a. Explain the synthesis of 1,3-difunctionalised compounds with suitable examples.

(5)

b. Describe the retrosynthesis of the following compound.

(5)



25 a. Explain the mechanism of synthesis of cubane.

(6)

b. Oxidizing agents are chemoselective in their action-Justify with suitable examples.

(4)

26 a. Discuss the role of active methylene compounds in organic synthesis. Explain the mechanism of Knoevenagal reaction.

(6)

b. How is mercuric acetate oxidation done on 2-pentene in the presence of water?

(4)

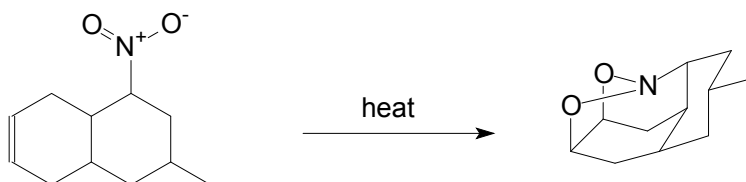
27 a. Discuss the FMO interaction of following pericyclic reactions.

(3+3)

- 1,3-sigmatropic rearrangement reaction
- 4 electron photochemical cycloaddition reaction

b. Predict a suitable mechanism for the following reaction.

(4)



28 a. What is photoisomerisation? How does it vary with respect to various photosensitizers used?

(5)

b. Derive Stern-Volmer equation.

(5)