



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – CHEMISTRY

FOURTH SEMESTER – APRIL 2014

CH 4813 - ORGANIC SYNTHESIS & PHOTO CHEMISTRY

Date : 27/03/2014

Dept. No.

Max. : 100 Marks

Time : 01:00-04:00

Part-A

Answer all the questions. Each carries two marks.

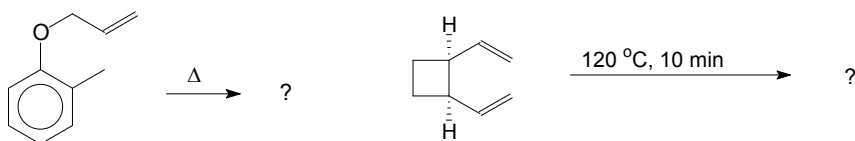
1. Why convergent synthesis is a better technique than stepwise synthesis?
2. Mention the umpolung concept with examples.
3. Write the importance of LDA in organic synthesis.
4. How does cyclodextrin act as a phase transfer catalyst?
5. Write the mechanism of ozonide formation.
6. Why is diborane reduction regioselective?
7. What is oxy-Cope rearrangement reaction?
8. What is the product formed when dichlorocarbene reacts with *trans*-2-butene?
9. What are the different types of energy transfer processes in photochemistry?
10. Mention the importance of intersystem crossing.

Part-B

Answer any eight questions. Each carries five marks.

11. Illustrate the retrosynthesis and synthesis of 1,3-difunctionalized compounds.
12. Describe in detail the protection and deprotection of aldehyde and amine.
13. Explain DDQ oxidation of cyclic compounds for aromatization.
14. Explain Wittig reaction and the importance of phosphorus ylids in organic synthesis.
15. Compare between dissolving metal reduction and catalytic reduction.
16. Explain the mechanism of CrO₃ oxidation of 2-butanol.
17. Draw the correlation diagram for the cycloaddition of 1,3-butadiene with ethylene. Predict whether the reaction is feasible thermally or photochemically.
18. Predict the products in the following sigmatropic rearrangement reactions.

a)



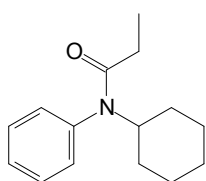
19. Discuss the FMO interaction in the following pericyclic reactions:
(a) 1,5-sigmatropic rearrangement reaction
(b) thermal-6 electron-electrocyclization reaction.
20. What are the products formed when 4,4-diphenylcyclohexa-2,5-dienone undergoes photochemical rearrangement reaction? Write its mechanism.
21. Explain the photoreduction of benzophenone using 2-propanol.
22. How does photodimerisation take place? Explain with an example.

Part-C

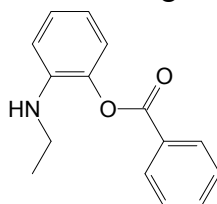
Answer any *four* questions. Each carries *ten* marks.

23a. Write the retrosynthesis and synthesis of following compounds.

i)



ii)



b. Explain the importance of FGI with suitable examples.

(5+5)

24a. How are phase transfer catalysts useful in organic synthesis? Explain with a Ziegler Natta catalyst.

b. Explain the LiAlH_4 reduction of benzamide.

(5+5)

25a. How are bicyclic compounds synthesized by electro-organic synthesis? Give any two examples.

b. Compare between Suzuki and Negishi coupling reactions.

(5+5)

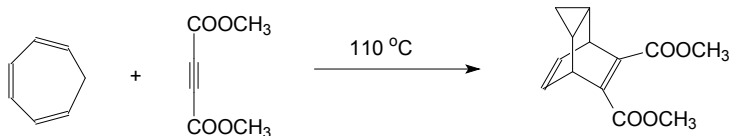
26a. How is regioselectivity in cycloaddition reactions explained? Illustrate with suitable examples.

(5)

b. Explain electrocycloisatation in cationic and anionic compounds. Give suitable examples.

27a. Predict the mechanism of following reactions.

ii)



b. Derive Stern-Volmer expression.

(5+5)

28a. Explain Paterno Buchii reaction in alkynes with suitable examples.

b. Explain the following photochemical rearrangement reaction.

(5+5)

