



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – CHEMISTRY

FOURTH SEMESTER – APRIL 2017

CH 4813- ORGANIC SYNTHESIS & PHOTO CHEMISTRY

Date: 18-04-2017
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

Part-A

Answer ALL questions.

(10 x 2 = 20)

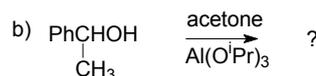
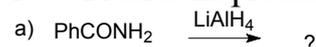
1. What are stereospecific and stereoselective reactions? Give suitable examples.
2. List out suitable synthetic equivalents for the 1,2 and 1,4 diketones.
3. Convergent synthesis is always preferred over linear synthesis. Justify.
4. How β -carbocation and α -carbon metal bonds are stabilized in the organosilicon derivatives?
5. Identify the product (A) in the following reaction
6. How is a carboxylic acid reduced by LiAlH_4 ?
7. State Woodward Hoffmann rules for cycloaddition reaction.
8. What are the types of electrocyclization reactions?
9. Mention the energy transfer process happening within chromophores.
10. What are photoquenchers? Give an example.

Part-B

Answer any **EIGHT** questions.

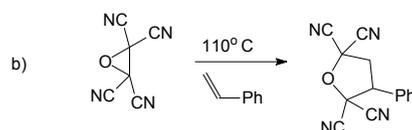
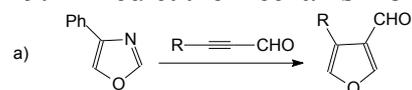
(8 x 5 = 40)

11. Analyse retro synthetically the following compounds and suggest suitable forward synthesis.
12. Discuss the retrosynthesis of 1,2- and 1,3-diketones.
13. What is Pfitzner-Moffatt oxidation? Give its mechanism and mention its disadvantages over Swern oxidation.
14. Explain Peterson olefination with suitable example.
15. Discuss the applications of trimethylsilyl halide in the organic synthesis.
16. Explain interfacial mechanism of phase transfer catalysis.
17. Predict the product in the following reactions and write the mechanism.
18. Compare the Clemmensen and Wolff Kishner reduction reactions with suitable examples.
19. Predict the mechanism of the following reactions (Each involves two steps).



18. Compare the Clemmensen and Wolff Kishner reduction reactions with suitable examples.

19. Predict the mechanism of the following reactions (Each involves two steps).



20. Draw the correlation diagram for the cycloaddition of 1,3-butadiene and ethylene. Predict whether the reaction is feasible thermally or photochemically.
21. Explain the photochemical rearrangement of 4,4'-diphenylcyclohexenone.
22. Derive Stern Volmer expression.

Part-C

Answer any **FOUR** questions.

(4 × 10 = 40)

23 a. Predict the synthons and synthetic equivalents for the following compounds.

b. Effect the following conversion.

(4 + 6)

24 a. Discuss the mechanism and stereochemistry of organocopper reagents towards substitution reactions.

b. Give two synthetic applications each of LDA and DIBAL.

(4+6)

25. Explain the following name reaction with suitable example.

(i) MPV reduction

(ii) Suzuki coupling

(iii) Heck reaction

(3+3+4)

26 a. Describe Cr(VI) oxidation with suitable example.

(4)

b. How is phenylhydroxylamine reduced electrochemically? Write the mechanism of the reaction.

(4)

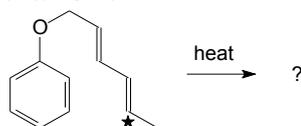
27 a. Identify the product and suggest a suitable mechanism.

(5)



b. The following reaction is an unusual Claisen rearrangement reaction. Identify the correct product formed and write its mechanism.

(5)



28 a. Identify the products formed from the following photochemical reactions.

(3+3)

(i) benzophenone + 2-methyl-2-butene $\xrightarrow{h\nu}$?

(ii) ethylbutyrate $\xrightarrow{h\nu}$?

b. Describe the photoreduction of benzophenone using

(i) isopropanol and (ii) diphenylmethanol.

(2+2)

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