

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



B.Sc. DEGREE EXAMINATION – CHEMISTRY

SIXTH SEMESTER – APRIL 2022

18UCH6MC03 – SYNTHETIC ORGANIC CHEMISTRY AND HETEROCYCLIC COMPOUNDS

Date: 15-06-2022

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

Part-A

Answer ALL questions.

(10×2=20)

1. Define retro synthesis.
2. Draw the structure of synthons and synthetic equivalents involved in the synthesis of amelfolide.
3. What is DIBAL? Mention any one of its synthetic application.
4. Write a suitable oxidizing agent for the conversion of toluene to benzoic acid.
5. Give an example for [3, 3] sigmatropic rearrangement reaction.
6. Mention any four important characteristics of pericyclic reactions.
7. How will you convert quinoline to nicotinic acid?
8. How will you prepare tetrahydropyrrole from pyrrole?
9. Give equation for the conversion of furan to succinaldehyde.
10. Predict the product formed in the reaction of pyridine with sodamide.

Part-B

Answer any EIGHT questions.

(8×5= 40)

11. Describe the importance of functional group interconversion in the synthesis of Oformine.
12. Predict the synthons and synthetic equivalents involved in the retro synthesis of N, N-dipropylamine and Daminozide.
13. Explain the following terms in retro synthesis i) Umpolung synthesis ii) Functional group activation.
14. What is Hydroboration – Oxidation reaction? Explain its mechanism and synthetic application with an example.
15. List any six chromium (VI) based oxidising agents and mention their advantages.
16. Describe the mechanism of Clemmenson reduction reaction.
17. Using FMO approach, predict the product formed on thermal and photo chemical electrocyclic reactions of cis, trans-2, 4-Hexadiene.
18. What are electrocyclic reactions? How are they classified? Give an example for each type.
19. Predict the mechanism for the following reactions.
(a) nitration of quinoline (b) sulphonation of furan
20. How will you prepare isoquinoline by Bischler-Napieralski synthesis method?
21. Discuss the nucleophilic substitution reactions of thiophene.

22. Predict the mechanism involved in the alkylation and arylation of pyridine.

PART-C

Answer any **FOUR** questions.

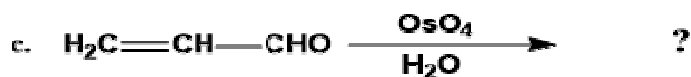
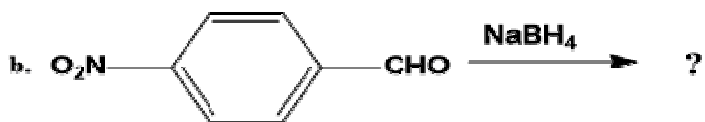
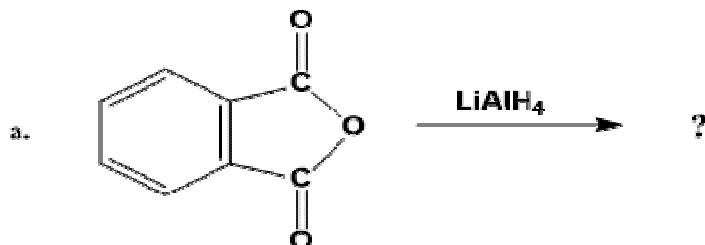
(4×10 =40)

23. Explain any five important synthetic strategies involved in the planning of retro synthesis.

24. a) Describe the application of bridging groups in retro synthesis. (5)

b) Predict the mechanism for Birch reduction reaction with one example. (5)

25. Predict the product for the following reactions.



26. What are cycloaddition reactions? Discuss the feasibility of thermal and photochemical [4+2]cyclo addition reactions by Frontier orbital method.

27. a) Why electrophilic substitution of pyrrole occurs preferentially at the C-2 position?(3)

b) Describe the various steps involved in the Hantzsch synthesis of pyridine. (7)

28. a) How will you synthesis indole by Fischer Indole synthesis? (5)

b) How is quinoline obtained by Skraup's synthesis? (5)
