LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

SIXTH SEMESTER – **APRIL 2023**

UCH 6503 – SYNTHETIC ORGANIC CHEMISTRY AND HETEROCYCLIC COMPOUNDS

Date: 05-05-2023 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART-A

Answer ALL questions. **(10 x 2 = 20 marks)**

1. What is meant by disconnection approach?
2. Give the purpose of using protecting group.
3. What is the product formed when isopropyl alcohol is treated with DMSO and oxalyl chloride?
4. Write any one synthetic application of organo-aluminium compounds.
5. What is meant by group transfer reaction?
6. Write an equation for oxy-Cope rearrangement reaction.
7. What are heterocyclic compounds?
8. Pyrrole does not give Diels-alder reaction. Account.
9. How is indole prepared?
10. What happens if quinoline is treated with butyl lithium?

PART-B

Answer any EIGHT questions. **(8 x 5 = 40 marks)**

11. Discuss the retrosynthesis of

    (i) acetyl acetone (ii) N,N-dipropylamine
12. Explain the terms consecutive and convergent synthesis. Which is better method and why?
13. Outline the retrosynthesis and synthesis of dichlorophenoxyacetic acid.
14. Compare Clemmenson and Wolf-Kishner reduction reactions.
15. Predict the product when anisole undergoes reduction reaction with Na, liq.NH_3/C_2H_5OH and propose a suitable mechanism.
16. Predict the products obtained by the oxidation of 2-methylpropan-1,2-diol using per-iodic acids.
17. Explain the electrocyclic ring closure reaction of 1,3,5-hexatriene derivatives.
18. Discuss [5,5]-sigmatropic rearrangement with an example.
19. Discuss the classification of heterocyclic compounds.

20. How is pyridine converted into (i) 2-aminopyridine (ii) 3-nitropyridine.

21. How is isoquinoline prepared by ring closure reaction?

22. Write a short note on the synthesis of benzothiophene.

PART-C

Answer any FOUR questions. **(4 x 10 = 40 marks)**

23. Write short notes on the following with examples.

(i) Activating group (ii) Synthetic importance of Umpolung reaction

24 a) Outline the synthesis of syn-tribromobenzene. **(5)**

b) How is pyrrole synthesized? Discuss any two important reactions. **(5)**

25. Discuss any one each synthetic applications of the following reagents

(i) LAH (ii) DIBAL (iii) $Pb(OAc)_4$ (iv) SeO_2 (v) NBS **(5x2)**

26. Explain the thermal and photochemical feasibility of [2+2] and [4+2] cycloaddition reactions using FMO approaches.

27 a) Discuss any one synthesis and two properties of piperidine. **(5)**

b) Discuss any three electrophilic substitution reactions of furan. **(5)**

28 a) Explain the steps involved in Skraup's synthesis of quinoline. **(5)**

b) Write the oxidation and reduction reactions of isoquinoline. **(5)**

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