LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

SIXTH SEMESTER – **APRIL 2025**

UCH 6503 – SYNTHETIC ORGANIC CHEMISTRY AND HETEROCYCLIC COMPOUNDS

Date: 30-04-2025 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

SECTION A

Answer ANY FOUR of the following **(4 x 10 = 40)**

1. Explain the concept of Umpolong synthesis with two examples.
2. Describe the role of activating groups and bridging group in organic synthesis.
3. Discuss the preparation and any three important applications of organo-aluminium compounds with examples.
4. Describe the importance of SeO_2, OsO_4 and DMSO in oxalyl chloride as oxidizing agents with examples.
5. Illustrate the mechanism of Clemmenson and Wolf-Kishner reduction reactions with examples.
6. Discuss [3,3] and [5,5]-sigmatropic rearrangement reactions with an example for each type.
7. a) How is pyridine converted into (i) 2-aminopyridine and (ii) 3-nitropyridine?
   b) What are heterocyclic compounds? How are they classified? (6+4)
8. a) Outline the Bischlar-Napieralsky synthesis of isoquinoline.
   b) How indole is prepared by Fischer Indole synthesis? (5+5)

SECTION B

Answer ANY THREE of the following **(3 x 20 = 60)**

9. a) Describe the importance of functional group interconversion in retrosynthesis with any two examples.
   b) How will you synthesis of 2,4-dichlorophenoxyacetic acid and daminozide using retrosynthetic approach? (10+10)
10. a) Describe the importance of any four chromium based oxidizing agents with examples.
    b) Write a note on Birch reduction and hydroboration-oxidation reaction. (10+10)
11. a) Describe the important characteristics of pericyclic reactions.
    b) Discuss the any two methods of synthesis of quinoline. (10+10)
12. Explain the thermal and photochemical feasibility of [2+2]- and [4+2]-cycloaddition reactions using FMO approach.
13. Describe the preparation and any three electrophilic substitution reactions of furan and thiophene.
14. a) Explain why quinoline is more reactive at position 8 than at position 5.
    b) Discuss the oxidation and reduction reaction of quinoline and isoquinoline. (10+10)
