

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**



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

**SIXTH SEMESTER – APRIL 2022**

**UCH 6503 – SYNTHETIC ORGANIC CHEMISTRY AND HETEROCYCLIC COMPOUNDS**

Date: 20-06-2022

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

**PART – A**

**Answer ALL the Questions.**

**(10 x 2 =20 Marks)**

1. What are synthons?
2. List the uses of protecting groups.
3. What is meant by hydroboration-oxidation? Give an example.
4. Predict the product of oxidation of cyclohexanone with  $\text{SeO}_2$ .
5. Write the reaction of cope rearrangement.
6. Draw the FMO picture of thermal electrocyclicization of 1,3,5,-hexatriene.
7. State Huckel's rule of aromaticity.
8. Give a method of preparation of thiophene
9. Mention two chemical properties of benzofuran.
10. Write a method of preparation of benzothiophene.

**PART – B**

**Answer EIGHT Questions**

**(8 x 5 =40 Marks)**

11. Explain the C-C and C-hetero atom disconnections with suitable examples.
12. How is functional group interconversion very important in organic synthesis? Explain with an example.
13. List out the uses of activating groups and bridging elements.
14. Explain the Birch reduction of anisole.
15. Discuss the method of oxidation isopropyl alcohol with DMSO and oxalyl chloride.
16. Describe the synthesis and application of organoaluminium compounds.
17. Explain electrocyclic reaction with example.
18. Discuss the mechanism of Sommelet-Hauser rearrangement.
19. Explain aromaticity in heterocyclic compounds.
20. Discuss the mechanism of nucleophile substitution reactions of pyridine.
21. Write the preparation and properties of indole.
22. Discuss the oxidation and reduction reactions of isoquinoline.

**PART-C**

**Answer any FOUR Questions.**

**(4 x 10 =40 Marks)**

23. a) What are alternate synthetic routes? Explain with suitable examples. (5)  
b) Write the retro synthesis of 2,4-dichlorophenoxy acetic acid. (5)
24. a) Explain the synthesis of 1,2-difunctional compounds based on Umpolung concepts. (5)  
b) How are Mn(VII) compounds employed for oxidation reactions in acidic and alkaline medium? Explain. (5)
25. a) Explain the mechanism of reduction of acetophenone by Wolf-Kishner method. (5)  
b) Discuss the mechanism of [4+2] cycloaddition reactions with suitable examples. (5)
26. a) Explain (5,5) sigmatropic rearrangement reactions with appropriate example. (5)  
b) Describe the electrophilic substitution reactions of pyrrole. (5)
27. Discuss the reactions and synthesis of tetrahydrofuran and piperidine.
28. Describe the preparation, electrophilic and nucleophilic substitution reactions of quinoline.

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