QP Code: P25B021

Reg. No : .....
Name : .....

ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

II SEMESTER (CBCSS-PG) DEGREE EXAMINATION, MARCH 2025
M Sc Chemistry
CHE2C07 : REACTION MECHANISM IN ORGANIC CHEMISTRY
2024 Admission Onwards
(Credits: 3)

Time: 3 Hours **Maximum Weightage: 30**

Section A

Answer **any eight** questions. Weightage **1** for each question. **(8x1 = 8 Weightage)**

1. Define *cine* substitution. Explain with example. [BTL1]
2. What is the order of S_N1 reactivity among methyl halide, primary alkyl halide, secondary alkyl halide and tertiary alkyl halide? [BTL1]
3. Explain the aspects regarding the mechanism and stereochemistry of S_E2 (front) and S_E2(back) substitution reactions. [BTL1]
4. Define extrusion reactions? Give an example. [BTL1]
5. Which is a faster reaction under thermal condition? [1,3] hydrogen shift or [1,3] methyl shift. Why? [BTL2]
6. Discuss the mechanism of α elimination with example. [BTL3]
7. Write down an example of a nucleophilic addition reaction and indicate how the substituent influence the orientation of the incoming group. [BTL3]
8. Write the stereochemical structure of Cholesterol. How can the number of methyl groups in it be determined by chemical degradation? [BTL3]
9. What is the product of the photoreaction of MeCH=CH-C(Ph)2-CH=CHMe? How does it form? [BTL3]
10. What are nodal planes? Draw the molecular orbital diagram for the lowest energy excited state of hexa-1,3,5 triene and indicate the HOMO. [BTL3]

Section B

Answer **any six** questions. Weightage **2** for each question. **(6x2 = 12 Weightage)**

11. Write a brief note on the S_E2 mechanism of electrophilic aliphatic substitutions. [BTL1]
12. Discuss Jablonski diagram. [BTL1]

Turn Over

13 Briefly describe the isolation of terpenoids [BTL2]

14. Discuss Mannich and Prins reactions with suitable example. [BTL3]

15. Analyze the mechanisms of acid catalyzed esterification. What are the evidences for these? [BTL4]

16. Illustrate Hoffmann-Loffler-Freytag reaction. [BTL4]

17. What information is deduced by Hofmann degradation of alkaloids? Illustrate. [BTL4]

18. Outline the conversion of Cholestrol into testosterone. [BTL5]

Section C

Answer **any two** questions. Weightage **5** for each question. **(2x5 = 10 Weightage)**

19. Write a detailed note on synthetically useful base catalyzed condensation reaction of carbonyl compounds. [BTL2]

20. Explain the photoreactions of benzene and its derivatives? Show how these reactions lead to interesting cyclic systems. [BTL4]

21. Using correlation diagram derive Woodward-Hoffmann rules for the electrocyclization of a linear conjugated 4-electron pi-system under thermal conditions. [BTL4]

22. Discuss the structure and reactions of reactive intermediates. [BTL5]

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