QP Code: P25C021

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

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

III SEMESTER (CBCSS-PG) DEGREE EXAMINATIONS, OCTOBER 2025
M. Sc. Chemistry
CHE3C11 : REAGENTS AND TRANSFORMATIONS IN ORGANIC CHEMISTRY
2024 Admission Onwards

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

Section A

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

1. Describe the stepwise mechanism of alkene ozonolysis.
2. Evaluate the process involved in Jacobsen epoxidation.
3. Write a note on Swern oxidation.
4. How does Wilkinson's catalyst work in hydrogenation reactions?
5. Describe the mechanism of the Birch reduction.
6. Examine the application of cyclodextrin in organic synthesis.
7. What is DABCO? Give one application.
8. Discuss carbonyl group reduction using hydrazine.
9. Examine the synthesis of Thymine.
10. What is the dienone–phenol rearrangement? Outline the key steps.

Section B

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

11. Explain the mechanism of hydroboration–oxidation.
12. Evaluate the Sharpless asymmetric dihydroxylation reaction in terms of its mechanism, stereoselectivity, and role in asymmetric synthesis.
13. Describe the reagents and conditions used in Bouveault–Blanc reduction and the products formed.
14. Explain the mechanism of Clemmensen reduction.
15. Analyze the synthetic use of 1,3 dithiane and trimethyl silyl chloride.
16. What are natural and synthetic rubbers? Explain with examples.

Turn Over

17. (a) Discuss the synthesis of Pyridine. (b) Explain Chichibabin reaction.

18. Analyse the mechanism for the Stille coupling reaction.

Section C

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

19. Discuss the reactions of (a) $NaBH_4$ (b) NBS (c) diborane.

20. Critically examine the process and significance of Merrifield's solid phase peptide synthesis.

21. Examine (a) Molecular Recognition (b) Molecular receptors for different types of cation, anion and neutral molecule (c) Multiple recognition.

22. Compare and contrast rearrangement reactions involving carbocation intermediates with those involving nitrene intermediates .

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