QP Code: P25C028

Reg. No : .....

Name : .....

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

III SEMESTER (CBCSS-PG) DEGREE EXAMINATIONS, OCTOBER 2025

M. Sc. Chemistry

CHE3E01 : SYNTHETIC ORGANIC CHEMISTRY

2024 Admission Onwards

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

Section A

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

1. Examine the role of TEMPO in oxidation reactions.
2. Predict the major product of the following reaction: $PhCH_2OH + IBX \rightarrow ?$
3. What is the overall transformation achieved in the Wolff–Kishner reduction?
4. What types of compounds are considered as organo-nonmetallic reagents?
5. Which reagent would you choose for selective oxidation of a secondary alcohol- PCC or Jones? Justify.
6. Define functional group equivalents.
7. Evaluate that a C-N cross-coupling reaction prepares a tricyclic indole. Write down the reaction.
8. What are common protective groups used for carbonyl and carboxylic acids in organic synthesis?
9. What is the basic structure of oxepines?
10. Perform a retrosynthetic analysis of a simple target molecule.

Section B

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

11. Discuss synthetic utility of periodic acid and lead tetraacetate.
12. What is the Sharpless Asymmetric Epoxidation reaction? Describe the stereochemical outcome involved.
13. Illustrate the hydroboration of an alkene and predict the product.
14. Compare the activity of nickel and palladium catalysts in hydrogenation.

Turn Over

15. Illustrate the synthetic applications of Dieckmann reactions with suitable examples.
16. Explain the catalytic cycle of cross-coupling reactions (a) Stille (b) Kumada.
17. Analyze a synthetic problem using disconnections and functional group interconversions.
18. Outline the preparation and typical reactions of Benzoxazole and Benzthiazole.

Section C

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

19. Write down the mechanism of following reactions: (a) Mannich (b) Stork enamine (c) Perkin (d) Darzen
20. Analyse the mechanism and the synthetic applications of the following cross-coupling reactions: (a) Suzuki-Miyaura (b) Heck.
21. Examine the enantioselective synthesis of Corey lactone.
22. Write down the Retrosynthetic analysis of a) Paracetamol from phenol
    (b) Bezocain from toluene

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