D 150267 **(Pages : 4)** **Name.....**

Reg. No.....

THIRD SEMESTER M.Sc. (CBCSS) [REGULAR/SUPPLEMENTARY] DEGREE EXAMINATION, NOVEMBER 2026

Chemistry

CHE 3C 11—REAGENTS AND TRANSFORMATIONS IN ORGANIC CHEMISTRY

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Section A

Answer any **eight** *questions.*

Each question carries a weightage of 1.

1. What is Riley reaction ? Give one example.
2. Which among the following reactions can be used for the reduction of acetophenone to ethyl benzene ? Justify your answer.

   (a) Bouveault-Blanc réduction. (b) MPV reduction.

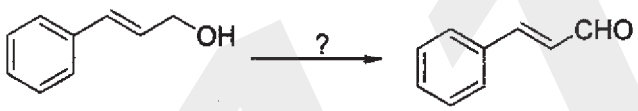
   (c) Wolff Kishner reduction. (d) Birch reduction.
3. Write one application of the Lindlar catalyst in organic synthesis.
4. Differentiate between thermosetting and thermoplastics.
5. Give one method for the synthesis of oxirane.
6. Write an example for a rearrangement reaction occurring through Carbene.
7. Predict the major product in the following reaction :



8. Draw the structure of adenine and guanine.
9. What is a block copolymer ? Explain with an example.

Turn over

10. How will you convert (E)-3-phenylprop-2-en-1-ol to cinnamaldehyde ?



(8 × 1 = 8 weightage)

Section B

Answer any **six** *questions.*

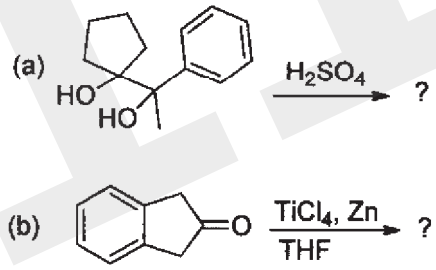
Each question carries a weightage of 2.

11. Describe the following epoxidation reactions with suitable examples. Predict the major enantiomer formed in each case.

    (a) Sharpless asymmetric epoxidation.

    (b) Jacobsen epoxidation.

12. Identify the reaction and predict the product in the following reactions. Explain the mechanism involved in each reaction.



13. Explain the uses of phase transfer catalysts (PTC) in organic reactions. Describe the principle of PTC-based catalysis.

14. Illustrate the step-wise procedure of Merrifield's solid-phase peptide synthesis.

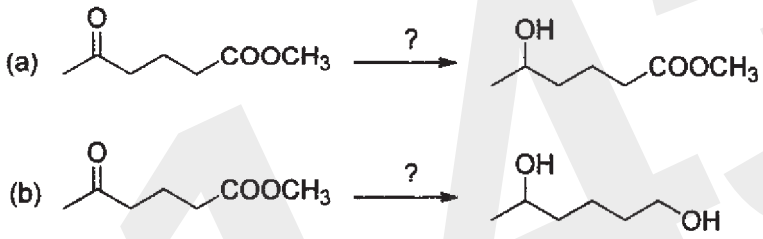
15. Provide one method of synthesizing the heterocyclic compounds given below :

    (a) Indole. (b) Quinoline.

16. Identify the reactions involved in the sequence of reactions leading to indole derivative B, and predict the structure of the intermediate product A.



17. Provide the appropriate reagents/conditions for the following reduction reactions. Justify your answer in each case.



18. Predict the product (with correct stereochemistry) when cyclohexene undergoes Prévost dihydroxylation and Woodward dihydroxylation reactions. Explain how the reaction conditions affect the stereochemistry of the product formed in each case.

(6 × 2 = 12 weightage)

Section C

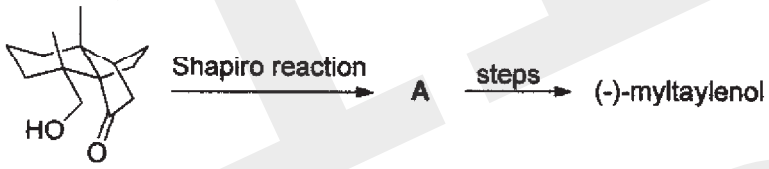
Answer any **two** *questions.*

Each question carries a weightage of 5.

19. (a) Predict the product formed when benzyl alcohol undergoes Swem oxidation. Illustrate the mechanistic details and discuss the advantages of this method over chromium-based reagents for oxidation reactions.

Turn over

(b) Shapiro reaction is a powerful method in natural product synthesis. Predict the product formed in the following scheme, which is used as the key step in the enantioselective total synthesis of (–)-myltaylenol in the laboratory. A general mechanistic illustration of the Shapiro reaction is also required.



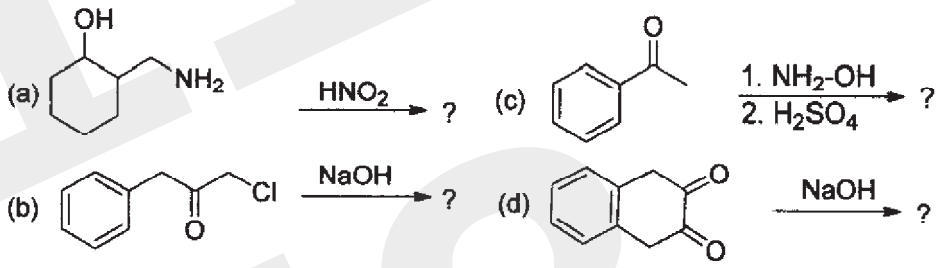
20. Explain the following reduction reactions with mechanistic details.

(a) Clemensen reduction. (b) Birch reduction.

(c) MPV reduction. (d) Bouveault Blank reduction.

21. What are molecular receptors ? Discuss their important applications and binding mechanisms in the recognition of cations, anions, and neutral molecules.

22. Four rearrangement reactions are given below. Identify the reaction and predict the product :



(2 × 5 = 10 weightage)