D 131962 **(Pages : 4)** **Name.....**

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2025

(CBCSS)

Chemistry

CHE 3C 11—REAGENTS AND TRANSFORMATIONS IN ORGANIC CHEMISTRY

(2019 Admission onwards)

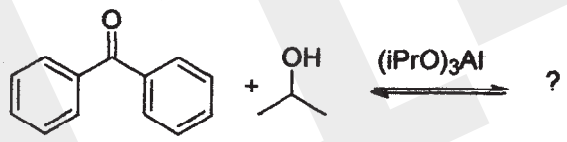
Time : Three Hours Maximum : 30 Weightage

Section A

Answer any **eight** *questions.*

Each question carries a weightage of 1.

1. Write one synthetic application of OsO_4 with a suitable reaction scheme.
2. Identify the forward reaction and predict the product.



3. What are Crown ethers ? Give one application in organic synthesis.
4. Why is NBS preferred to Br_2 in allylic bromination ? Draw the structure of the product in the given reaction.

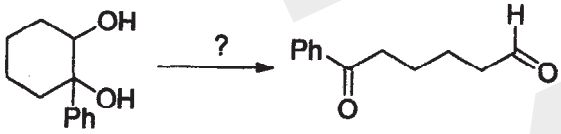
5. Discuss the structural features of cellulose.
6. Describe the non-covalent interactions used in supramolecular devices.

Turn over

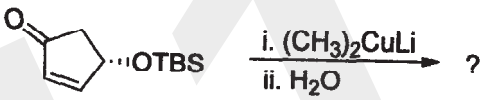
7. How will you prepare the following molecule using Sonogashira coupling reaction ? Suggest appropriate substrate(s) and reagents/conditions for the synthesis.

1,2-diphenylethyne

8. A 1, 2-diol is converted to a diketone as shown below. Predict the condition that facilitates this conversion and draw the structure of the resulting intermediate.



9. Identify the reaction and predict the product of the given reaction.



TBS = *tert*-butyldimethylsilyl

10. Write two amino protecting groups commonly used in peptide synthesis.

(8 × 1 = 8 weightage)

Section A

Answer any **six** *questions.*

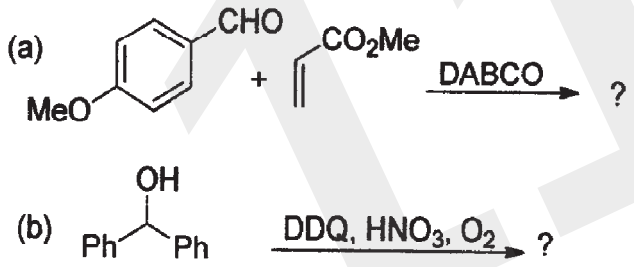
Each question carries a weightage of 2.

11. Explain the following oxidation reactions with suitable examples. Illustrate the mechanistic details of each reaction.

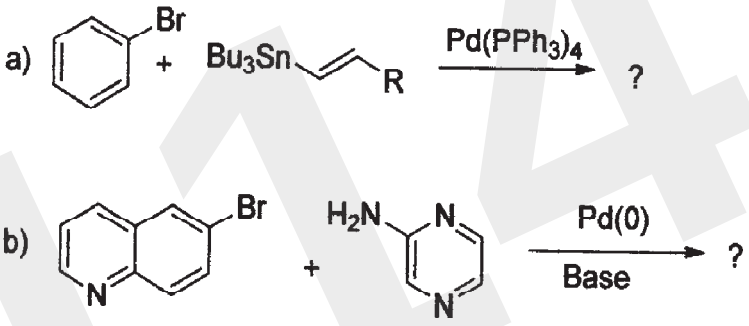
    (a) Swern oxidation.

    (b) Dess Martin oxidation.

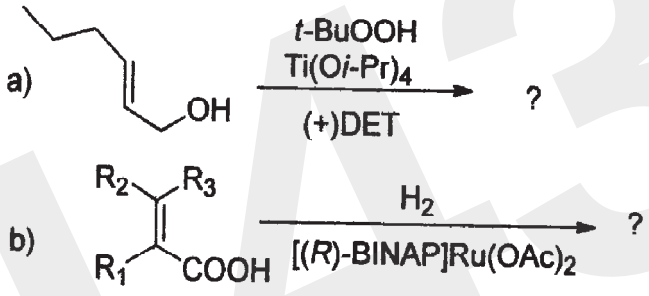
12. Draw the chemical structure of the common reagents, DABCO and DDQ. Predict the product in the given reactions catalysed by these reagents.



13. Two cross-coupling reactions are given. Predict the product and identify the reaction in each case.



14. Draw the structure of the major stereoisomer of the following stereoselective reactions. Justify your answer :



15. Discuss the preparation and applications of BUNA-S and BUNA-N.

16. Write one method of preparation of quinoline. Explain each step involved in the synthesis.

17. Describe the following rearrangement reactions with suitable examples.

    (a) Favorskii.

    (b) Beckmann.

18. Write a short note on supramolecular catalysis.

(6 × 2 = 12 weightage)

Section C

Answer any **two** *questions.*

Each question carries a weightage of 5.

19. Compare the dihydroxylation of alkenes using the Prevost and Woodward dihydroxylation methods. Using examples, illustrate the mechanistic details and stereoselectivity in each case.

20. (a) Describe the reducing properties of metal hydrides, $LiAlH_4$ and DIBAL-H. Discuss their applications in organic synthesis.

    (b) Discuss radical polymerization method.

21. (a) Draw the structure of glutathione. How is it synthesized ?

    (b) Explain Fischer indole synthesis.

22. What are nitrenes ? Illustrate the following rearrangement reactions occurring through nitrene.

    (a) Curtius. (b) Lossen.

    (c) Hofmann. (d) Schmidt.

(2 × 5 = 10 weightage)