D 11616 (Pages : 3) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Chemistry

CHE 3E 01—SYNTHETIC ORGANIC CHEMISTRY

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A

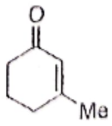
Answer any **eight** *questions.*

Each question carries a weight of 1.

1. Give an example each for two different types of synthetically useful oxidation reactions of *m*-chloroperbenzoic acid.

2. Predict the major product in the following reaction:

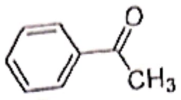
3. How will you synthesise the following compound starting from cyclohex-2-enone ?



4. Illustrate the application of allyl silanes in organic synthesis.

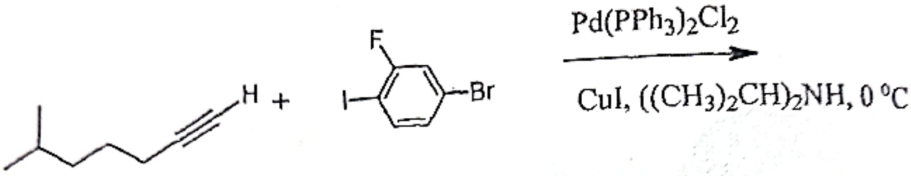
Turn over

5. Suggest a logical disconnection for the following target compound. Justify the answer :



6. Write down the structure of aldol condensation product/s obtained from benzaldehyde and

7. Write down the structure of the major cross coupling product in the following reaction



8. Differentiate between synthons and synthetic equivalents. Give examples.

9. What is the significance of functional group interconversions in organic synthesis?

10. Write down the conditions and reagents used for the protection and deprotection of THP ethers.

(8 x 1 =

Section B

Answer any **six** *questions.*
Each question carries a weight of 2.

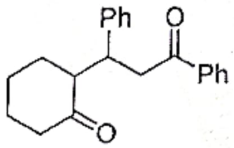
11. Indicate the differences in reactivity shown by $LiAlH_4$ and $NaBH_4$ in their reaction compounds.

12. Give one example each of a homogeneous and a heterogeneous hydrogenation catalyst typical applications of each.

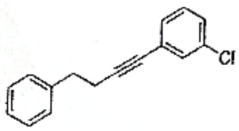
13. How will you account for the retention of configuration in the following substitution

14. Illustrate the synthetic applications of Dieckmann reaction with a suitable exa

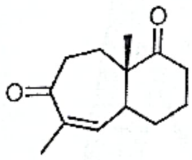
15. Suggest a one pot synthesis for the following compound starting from an appropriate carbonyl compounds. Explain the reaction involved.



16. Outline a synthesis for the following compound starting from simple acetylenic substrates.



17. How was the following ketone transformed into longifolene in the Corey's synthesis ?



18. Write down a laboratory synthesis of 8-hydroxy quinolone.

(6 × 2 = 12 weightage)

Section C

Answer any **two** *questions.*

Each question carries a weight of 5.

19. Write a note on Sharpless asymmetric epoxidation and explain the stereochemical outcome observed.

20. Discuss the applications of alkylboranes in organic synthesis. Give examples.

21. Illustrate Stork-enamine reaction and explain its advantages with appropriate examples.

22. Outline the synthetic strategy in the Reichstein process for Vitamin C.

(2 × 5 = 10 weightage)