(31)

304810

D 31107

(Pages : 3)

Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2022

(CBCSS)

Chemistry

CHE 3E 01—SYNTHETIC 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. Suggest suitable reagents for the selective oxidation of primary alcohols to aldehydes.

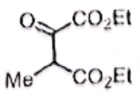
2. How will you effect the following conversion ?

3. Write down the reagents and conditions required to effect the following transformation in synthetically acceptable yields.

4. Comment on the reactivity of alkenyl silanes and its application in organic synthesis.

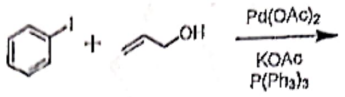
5. What are functional group equivalents ? Give two examples.

6. Provide the structure of the enolate donor and carbonyl acceptor in the formation of the following condensation product.



Turn over

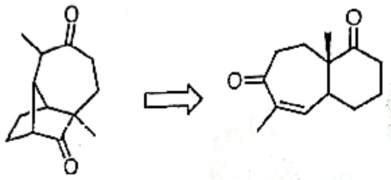
7. Predict the major product obtained in the following reaction :



8. Suggest a protecting group for carboxylic acids, which is stable towards nucleophiles. Indicate the conditions for protection and removal.

9. Differentiate between stereoselective and stereospecific reactions.

10. Explain the logic of the following disconnection.

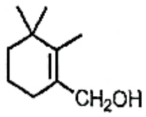


(8 × 1 = 8)

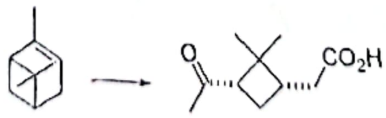
Section B

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

11. The following substrate is subjected to Sharpless asymmetric epoxidation in the presence of (+)–DET. What are the other reagents and the oxidant involved ? Predict the structure of the product.



12. Suggest suitable reagent/s for the following conversion. Explain the stereochemical aspects.

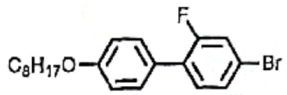


13. With appropriate examples give the reaction of Gilman's reagent with alkylhalides, epoxides and α,β-unsaturated ketones.

14. Draw the structure of a reagent that could be used to install a CBZ group onto an amine. Under which conditions is a CBZ-protected amine best deprotected ? What are the reaction products ?

15. Describe the synthesis and application of Mannich bases.

16. What is a Negishi coupling reaction ? Illustrate its application in the synthesis of the following compound.



17. Explain the concept of *Umpolung* in organic synthesis.

18. Write down the structure and names of all oxadiazoles. Outline a simple synthesis of any *one*.

(6 × 2 = 12 weightage)

Section C

Answer any **two** *questions.*
Each question carries a weightage of 5.

19. Write a note on Woodward and Prevost hydroxylation, and explain the stereochemical outcome observed.

20. Illustrate Robinson annulation reaction and explain its applications with suitable examples.

21. Explain the catalytic cycle of Suzuki coupling. What are the advantages of this strategy over other coupling reactions ?

22. Discuss the synthesis of Corey lactone and its significance in the synthesis of prostaglandins.

(2 × 5 = 10 weightage)