D 11615 (Pages : 3) Name.....

Reg. No.....

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

(CBCSS)

Chemistry

CHE 3C 11—REAGENTS AND TRANSFORMATIONS IN ORGANIC CHEMISTRY

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

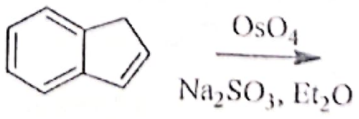
General Instructions

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 weightage of 1.

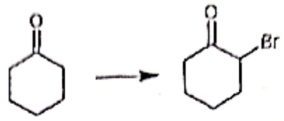
1. Predict the product in the following reaction :



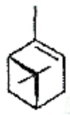
2. Write down the structure of Jacobsen catalyst and indicate its application/s.
3. Suggest suitable reagents and conditions required to effect the following conversion in a single step.

4. Give an example of Wolff Kishner reduction. Comment on the functional group tolerance reaction.

5. How will you effect the following transformation in a one pot procedure ?



6. Write down the structure of 9-BBN. Give the structure of the product obtained by its reaction with the following compound.

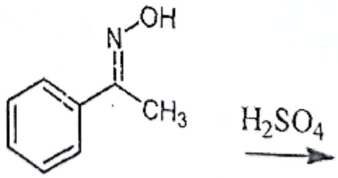


7. What are the two common secondary structural elements in proteins ? What are the forces these structures ?

8. Write down the structure of : a) Oxirane ; b) Guanine.

9. Outline the mechanism of Fries rearrangement with a suitable example.

10. The following compound undergoes an acid catalyzed rearrangement. Predict the product obtained.

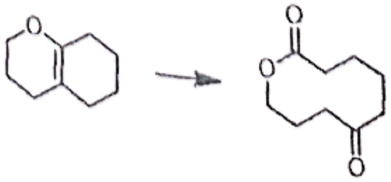


(8 x 1 =

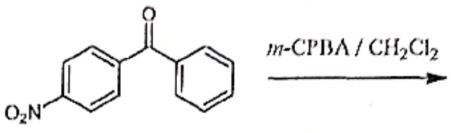
Section B

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

11. How will you effect the following conversion ?



12. Predict the major product in the following reaction. Justify the answer.



13. Write down the mechanism of alkyne reduction with Na and NH_3(liq). Justify the stereochemical outcome.

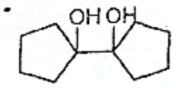
14. What is a pinacol coupling reaction ? Illustrate the synthetic applications with examples. What are the limitations of this C-C bond formation strategy ?

15. Write down the mechanism of DCC mediated ester formation reaction from carboxylic acids and alcohols.

16. How is the terminal amino acids of a peptide chain determined ?

17. Illustrate the mechanism of Wagner-Meerwein rearrangement with an appropriate example.

18. The following diol undergoes a rearrangement reaction when treated with a strong acid. Indicate the structure of the product and give a plausible mechanism.



(6 × 2 = 12 weightage)

Section C

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

19. Write a brief note on : a) oxidations with Dess-Martin periodinane, b) Riley reaction.

20. a) α, β-Unsaturated compounds undergo reduction with Na and NH_3 (liq). Indicate the major products obtained and outline the mechanism involved.

    b) Illustrate the application of diimide reductions.

21. Write notes on : a) reaction of tributyltin hydride with organic halides, b) application of 1,3-dithiane in reactivity *umpolung*.

22. Give a short account of Merrifield solid phase peptide synthesis and enumerate the scheme for the synthesis of phenylalaninyl-glycinyl-valine.

(2 × 5 = 10 weightage)