D2ACH2103 **(3 Pages)** **Name.....**
Reg.No.....

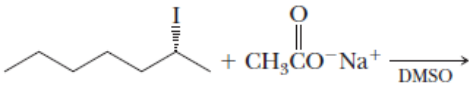
SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2022
(Regular/Improvement/Supplementary)

CHEMISTRY
FCHE2C07: REACTION MECHANISM IN ORGANIC CHEMISTRY

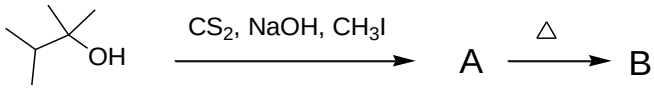
Time: 3 Hours **Maximum Weightage: 30**

Section A: Short answer questions. Answer any *eight* questions. Each carries 1 weightage.

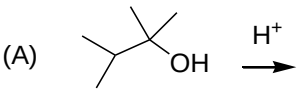
1. Predict the expected product of the reaction and suggest the mechanism by which the product formed.

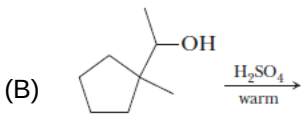


2. Show how will you convert 1-chloroethane into 3-hexyne by nucleophilic substitution reaction.
3. Write an example involving S_Ei mechanism.
4. Identify A and B in the following reaction.

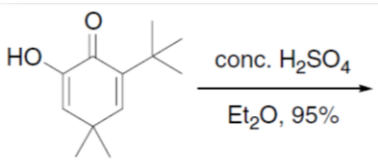


5. Write an example for the formation and a reaction involving nitrene intermediate.
6. Explain in brief about the structure of nitrene?
7. Give the structure of the cationic intermediates that are formed in the following reactions.





8. What is Reformatsky reaction?
9. Write the tandem steps involved in the conversion of α-diazocarbonyl into a ketene.
10. Predict the product and write the important steps involved in reaction.



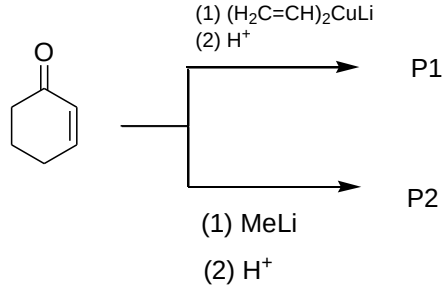
(P.T.O.)

11. Write the reaction involving the conversion of 2-chlorocyclohexanone into methyl cyclopentane carboxylate.
12. Write a short note on Sommelet-Hauser Rearrangement.

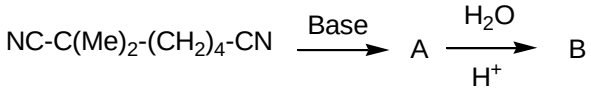
(8 × 1 = 8 weightage)

Section B: Short essay questions. Answer any *four* questions. Each carries 3 weightage.

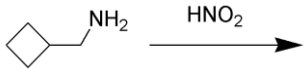
13. Discuss the factors affecting the competition of S_N2 reaction and E2 elimination by citing suitable example.
14. Identify the products of the reaction. Justify your answer.



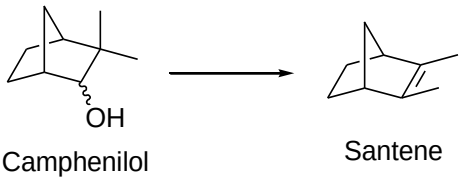
15. Discuss the formation and stability of classical and non-classical carbocation.
16. Identify A and B in the reaction and write the mechanism.



17. What conditions are required for allylic halogenation to be occurred? Why does this reaction outcompete addition when these conditions are met? Justify your answer by citing an example.
18. Write the product of the following reaction and suggest a mechanism.



19. How would you convert Camphenilol to Santene?



(4 × 3 = 12 weightage)

Section C: Essay questions. Answer any *two* questions. Each carries 5 weightage.

20. (a) Discuss the mechanistic and stereochemical aspects of reactions of enantiomers of 1,2-Dibromo-1,2-diphenylethane with sodium ethoxide.

    (b) Write the mechanism of E1cB elimination.

21. Write the mechanism of:

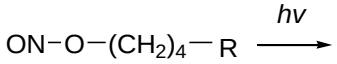
    (a) Claisen condensation, (b) Perkin reaction, (c) Stobbe condensation and (d) Knoevenagel condensation.

22. (a) Write a brief note on Hoffmann-Loeffler-Freytag reactions.

    (b) Discuss McMurry Coupling.

    (c) Predict the product of the reaction of triplet carbene with E-stilbene.

    (d) Write the structure of the intermediates and product formed in the reaction.



23. Discuss the following rearrangements occurred at electron deficient nitrogen.

    (a) Hofmann (b) Curtius (c) Lossen (d) Schmidt and (e) Beckmann.

(2 × 5 = 10 weightage)