

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2021
(Regular/Improvement/Supplementary)

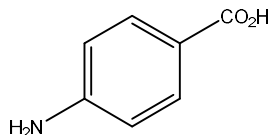
CHEMISTRY
FCHE3E01 - SYNTHETIC ORGANIC CHEMISTRY

Time: Three Hours

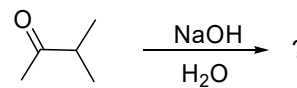
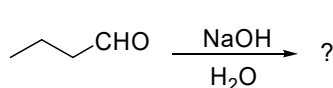
Maximum Weightage: 30

Section A: Short answer questions. All questions can be answered. Each carries one weightage (Ceiling 6 weightage).

1. Illustrate the use of DCC as an organic synthetic reagent with two examples.
2. Differentiate between synthons and synthetic equivalents. Give two examples of synthons.
3. Mention any two reagents used for the conversion of *cis*-2-butene to *cis*-2,3-butanediol.
4. Suggest a suitable retrosynthetic strategy for the synthesis of the following compound from toluene.



5. What is Gilman reagent? List out any two applications.
6. Discuss Birch reduction with an example.
7. What is Hiyama cross coupling? Explain with a suitable example.
8. How one can synthesize stilbene using Wittig reaction?
9. Why carbonyl compounds prefer nucleophilic addition reactions? Which is more reactive, aldehyde or ketone and why?
10. The aldehyde and ketone below are self-condensed with aq. NaOH so that an unsaturated carbonyl compound is the product. Give the product and explain why you think the product is formed?

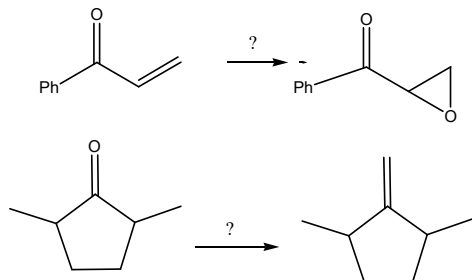


11. What is Tischenko reaction? How it differs from the well known Cannizaro Reaction?
12. Give an instance of palladium catalysed coupling used in the synthesis of cyclic peptides.

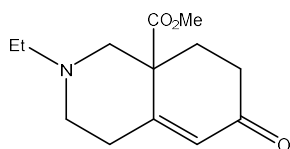
(P.T.O.)

Section B: Short essay question. All questions can be answered. Each carries four weightage (Ceiling 12 weightage).

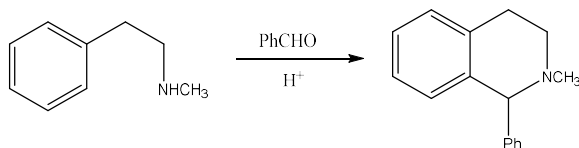
13. Predict the reagent and explain the mechanism.



14. What is ozonolysis? Give its mechanism. How it can be used for the structure elucidation of alkenes?
15. Illustrate how Robinson annulation can be used in the synthesis of:



16. Discuss one application each of LiAlH₄, DIBAL-H, NaBH₄ and NaCNBH₃.
17. Explain the use of trimethyl silyl groups in modern organic synthesis.
18. Suggest a mechanism for the following reaction (Hint: Mannich Reaction)



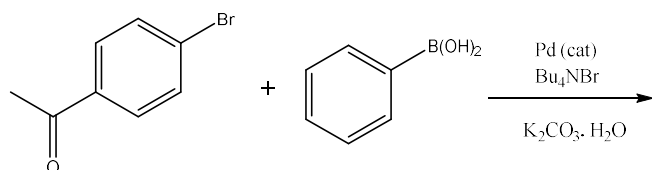
19. Illustrate one group and two group C-X, C-C disconnections with appropriate examples.

Section C: Essay questions. Answer All questions can be answered. Each carries six weightage (Ceiling 12 weightage).

20. Retrosynthetically analyse the synthesis of longifoline. Give explanations to the strategies used.
21. Mechanistically illustrate:
- The conversion of benzyl alcohol to benzaldehyde by Swern Oxidation
 - How acetone will react under the conditions of MPV reduction?
 - The conversion of 3-pentanone to 2-pentene via a hydrazone intermediate.

22. a) Discuss Stille cross coupling reaction and its applications.

b) Predict the product and elucidate the mechanism.



23. Give an account of mechanism and product of following reactions.

