

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2024
(Regular/Improvement/Supplementary)

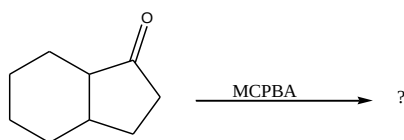
CHEMISTRY
FCHE3E01 - SYNTHETIC ORGANIC CHEMISTRY

Time: 3 Hours

Maximum Weightage: 30

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

1. Give two methods for generating singlet oxygen.
2. Find out the product:



3. What is Sharpless asymmetric epoxidation?
4. Illustrating mechanism, explain the synthetic importance of MPV reduction.
5. Give any two applications of Wilkinson's catalyst.
6. Write a note on reduction of multiple bonds in the presence of Lindlar's catalyst.
7. Grignard reaction generally carried out under nitrogen atmosphere. Explain whether it's a correct statement or not.
8. Explain Robinson ring annulation reaction using an example.
9. How will you synthesize cinnamic acid from benzaldehyde? Explain with mechanism.
10. What happens when formaldehyde is treated with Con. NaOH solution? Explain.
11. How will you effect the synthesis of the following.



12. Explain the term FGI using an example.

(8 × 1 = 8 weightage)

(P.T.O.)

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

13. Starting from cyclohexene how will you obtaine *trans*- and *cis*-1,2-dihydroxycyclohexane. Give mechanism.
14. Write a note on oxidation of alkenes using: (a) Ozonolysis; (b) Pb(OAc)₄.
15. Discuss with appropriate mechanism: (a) Birch reduction; (b) Clemmenson reduction.
16. Give an account on diimide and hydrazine mediated reduction reactions.
17. Write notes on: (a) Peterson reaction; (b) Tebbe's reagent.
18. Discuss the synthetic importance of different sulfur ylides.
19. Elaborate the steps involved in the preparation of ketones from aldehydes based on the concept of umpolung.

(4 × 3 = 12 weightage)

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

20. Discuss the applications of copper, chromium, silicon and boron based synthetic reagents.
21. Explain:
 - (a) Pd catalyzed amine arylation reaction with mechanism.
 - (b) Heck Coupling with mechanism.
22. Describe the mechanism and synthetic applications of:
 - (a) Sonogashira cross coupling reactions.
 - (b) Stille carbonylative cross coupling reaction.
23. Discuss the synthetic route to Longifolene based on E. J. Corey's retrosynthetic analysis.

(2 × 5 = 10 weightage)