A–0992

Total Pages : 4 **Roll No. .....**

MSCCH-606

M.Sc. Chemistry (MSCCH)

Organic Synthesis

Examination February, 2026

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. ***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section–A

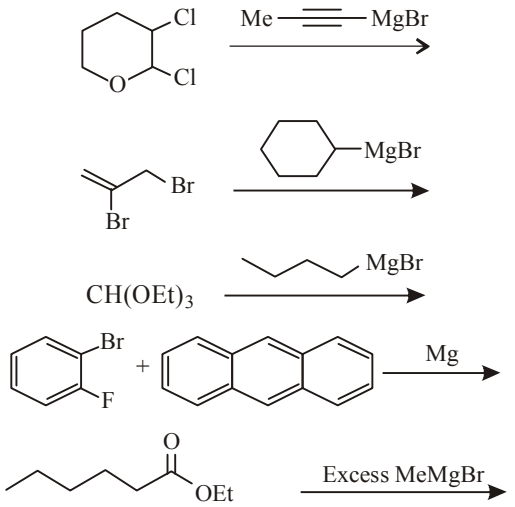
Long Answer Type Questions (2×19=38)

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. Discuss the principles, preparation, and applications of organometallic reagents in organic synthesis with suitable examples from Group I, II, and transition metal compounds.

2. Explain the mechanism and synthetic applications of various oxidative processes involving hydrocarbons, alcohols, aldehydes, and ketones.

3. (a) Complete the following reactions :



(b) What is the difference in the stereochemistry of product during the Prevost and Woodward oxidation reaction ?

4. What is the disconnection approach ? Explain the concept of synthons, synthetic equivalents, and the importance of chemoselectivity in multistep synthesis.

5. Which reducing agent causes the selective reduction of alkynes into cis and Trans alkenes Define else reactions with their mechanism ?

Section–B

Short Answer Type Questions (4×8=32)

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Write a note on the preparation and reactions of metallocenes.

2. (a) What is FGI ? Why there is need of FGI in case of few amines ?

   (b) What is the importance of order of event in the retrosynthesis ?

3. Discuss the mechanism of protection and deprotection of alcohols as trimethyl ethers.

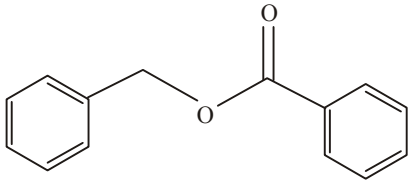
4. Define the pyramidal inversion and ring inversion in piperidine.

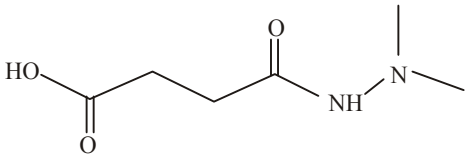
5. Give the Mechanism of the following Reaction :

   (a) Clemenson Reduction

   (b) Wolf-Kishner Reduction

6. Show the Disconnection approach for the following molecules; represent synthons and respective synthetic equivalents and forward direction reaction :

(a) 

(b) 

7. Explain the concept of reversal of polarity in organic synthesis.

8. Describe the synthesis of five-membered heterocyclic compounds with suitable examples.

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