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**M.Sc. (Semester-III)
Examination, Dec.-Jan., (2025-26)**

CHEMISTRY

(Reagents and Organic Synthesis)

Time Allowed : Three Hours

Maximum Marks : 70

Note : This question paper is divided into four sections. Attempt questions from all four sections as per given direction. Distribution of marks is given in each section.

SECTION-A

(Objective Type Questions)

1. Attempt any ten questions. Each question carries 1 mark. [10x1=10]

(A) Choose the correct answer :

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(1)

[P.T.O.]



- (i) Which reagent is used for the oxidation of carbon-carbon double bond?
- (a) NaBH_4
 - (b) Zn/HCl
 - (c) OsO_4
 - (d) LiAlH_4
- (ii) Which of the following is a reducing agent?
- (a) DIBAL-H
 - (b) KMnO_4
 - (c) H_2O_2
 - (d) OsO_4
- (iii) Reagent used for homogeneous hydrogenation is :
- (a) Raney nickel
 - (b) Pd/C
 - (c) PtO_2
 - (d) Wilkinson catalyst

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- (iv) The Diels-Alder reaction involves formation of :
- (a) Three-membered ring
 - (b) Four-membered ring
 - (c) Five-membered ring
 - (d) Six-membered ring
- (v) The reagent used for amino oxidation is :
- (a) Peracid
 - (b) SeO_4
 - (c) OsO_4
 - (d) KMnO_4
- (B) Fill in the blanks :
- (vi) Michael addition involves addition to _____.
- (vii) Retrosynthetic analysis was developed by _____.

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[P.T.O.]



- (viii) Robinson annulation is a combination of _____ and _____.
- (ix) Super hydride is chemically known as _____.
- (x) _____ is commonly used for oxidation of allylic C-H bonds.

Write True or False :

- (xi) Pd/C is generally used for catalytic hydrogenation. [True/False]
- (xii) Diels-Alder reaction is [4+4] cycloaddition reaction. [True/False]

SECTION-B

(Very Short Answer Type Questions)

Note: Attempt any five questions. Each question carries 2 marks. (Word limit : 25-30 words) [5x2=10]

2. (i) Define oxidation in organic chemistry.
- (ii) Name one reagent used for oxidation of alcohol.
- (iii) What is the role of Raney Nickel in reduction?
- (iv) Mention one example of dissolving metal reduction.

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(4)

- (v) Write one use of SeO_4 in organic synthesis.
- (vi) What do you understand by Amino oxidation?
- (vii) Describe reduction of alkyne by DIBAL.

SECTION-C

(Short Answer Type Questions)

Note: Attempt any five questions. Each question carries 04 marks. (Word limit : 250 words) [5x4=20]

3. (i) Write a short note on catalytic hydrogenation.
- (ii) Explain the principle of retrosynthetic analysis.
- (iii) Explain Michael addition.
- (iv) What is Robinson annulation? Give its mechanism.
- (v) Compare reducing properties of LiAlH_4 and NaBH_4 .
- (vi) Write the synthetic importance of transition metal reagents.
- (vii) Discuss preparation, properties and application of Organolithium reagent.

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(5)

[P.T.O.]



SECTION-D

(Essay Type Questions)

Note: Attempt **any three** questions. Each question carries 10 marks. (Word limit 500 words) [3x10=30]

4. (i) Discuss various oxidation methods with suitable reagents and examples.
- (ii) Describe two group C-C disconnection with reference to Diels-Alder reaction.
- (iii) What is Umpolung? Give examples of organic synthesis employing various umpolung reagents.
- (iv) Explain preparation and properties of NaBH_4 in detail.

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