QJ-5242

M. Sc. (Sem. III) Examination, December - 2023

Chemistry

Paper - 3.3

CHEM - 633
Organic Synthesis

(Organic Chemistry Specilization)

Time allowed : **Three Hours**

Maximum Marks : **70**
Min. Pass Marks : **28**

Note : This question paper will be divided into three sections as under :

SECTION - A **Max. Marks 10**

Will carry 10 marks with 01 compulsory question comprising 10 short answer type questions (maximum 20 words answer) taking two questions from each unit. Each question shall be of one mark.

SECTION - B **Max. Marks 25**

Will carry 25 marks with equally divided into five long answer type questions (answer about in 250 words). Students are instructed to attempt five questions by selecting one question from each unit.

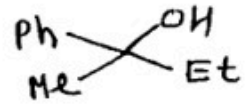
SECTION - C **Max. Marks 35**

Will carry 35 marks with five long answer type questions comprising one compulsory question of 15 marks and four questions of 10 marks each. Students are instructed to attempt total three questions with one compulsory question (answer about in 500 words) and any two more questions (answer about in 400 words) out of remaining four questions.

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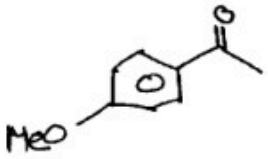
SECTION - A

1 (i) Give the synthetic equivalent of the following target molecule.



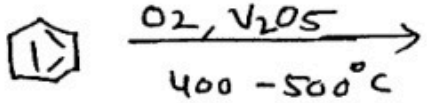
(ii) What is *disconnection approach?*

(iii) Give the *synthetic equivalent of the following target molecule.*

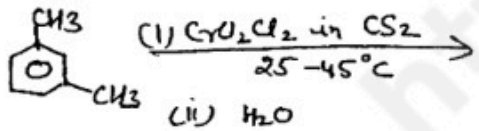


(iv) Define stereoselectivity.

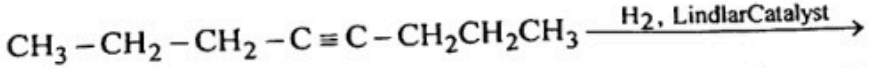
(v) Complete the following reaction.



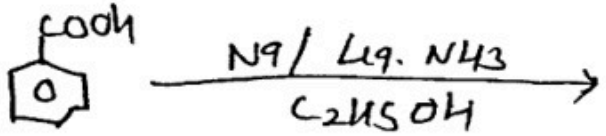
(vi) Complete the following reaction.



(vii) Complete the following reaction.



(viii) Complete the following reaction.



(ix) Which intermediate is formed in the Hoffman bromamide rearrangement.

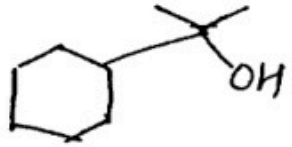
(x) What is migratory aptitude.

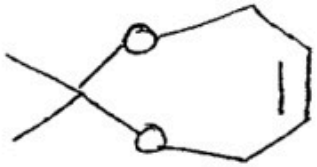
1×10=10

SECTION - B

UNIT - I

2 Give the retrosynthesis analysis and synthesis of the following target molecule :

(i) 

(ii) 

$$2\frac{1}{2}+2\frac{1}{2}=5$$

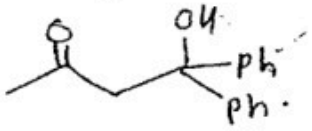
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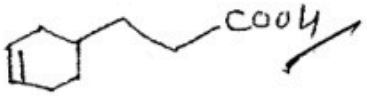
3 Explain the following with suitable example :
(i) Reversal of polarity
(ii) Chemo-selectivity.

$$2\frac{1}{2}+2\frac{1}{2}=5$$

UNIT - II

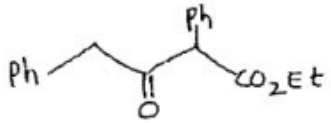
4 Give the retrosynthesis outline and synthesis of following target molecules :

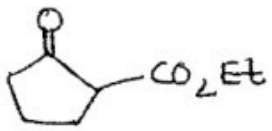
(i) 

(ii) 

$$2\frac{1}{2}\times 2=5$$

5 Give the retrosynthesis analysis and synthesis of the following target molecules :

(i) 

(ii) 

$$2\frac{1}{2}\times 2=5$$

UNIT - III

6 Explain the oxidation of primary alcohol to aldehyde by following method (with mechanism)
(i) Chromium
(ii) Oxide
(iii) Dimethyl sulfoxide.

$$2\frac{1}{2}+2\frac{1}{2}=5$$

7 *Give the following reaction with mechanism :*
(i) Oxidation of 1, 2 diol by cerric ammonium nitrate.
(ii) Oxidation of primary amine by hydrogen peroxide.

$$2\frac{1}{2}+2\frac{1}{2}=5$$

UNIT - IV

8 Write short notes on :
(i) Birch reduction
(ii) Homogeneous hydrogenation

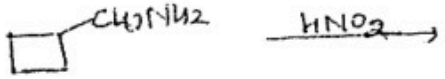
$$2\frac{1}{2}+2\frac{1}{2}=5$$

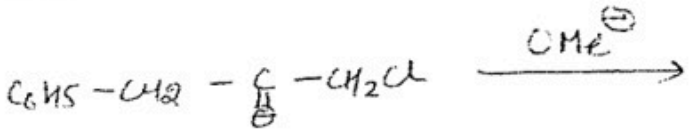
9 Explain the reduction of Carbonyl compounds to alcoholes by hydride transfer reaction. 5

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UNIT - V

10 Complete the following reactions with suitable mechanism :

(i) 

(ii) 

$$2\frac{1}{2}+2\frac{1}{2}=5$$

11 Write the mechanism of following rearrangement:

(i) Neber rearrangement

(ii) Lossen rearragement.

$$2\frac{1}{2}+2\frac{1}{2}=5$$

SECTION - C

12 Write the reaction and their suitable mechanism of the following rearrangement:

(i) Benzil - Benzilic acid rearrangement

(ii) Wagner - Meerwein rearrangement

(iii) Baeyer - Villiger rearrangement

3×5=15

13 What are protecting groups? Give the various methods for protection of (i) Alcohol and (ii) Carbonyl groups.

2+4+4=10

14 Write short notes on :

(i) Robinson Annellation

(ii) Use of acetylenes in disconnection approach.

5+5=10

15 Write short notes on :

(i) Oxidation with thallium (III) nitrate

(ii) Oxidation of carboxylic acid.

5+5=10

16 (i) Explain the reduction of alkene by various methods.

(ii) Write short notes on Hydrogenolysis.

5+5=10

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