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B.Sc.-M.Sc. Integrated Program, Chemistry/Semester-III Examination-2023
Paper Title: Halogens, Oxygens and Nitrogen containing Functional groups
Paper Code: BCH-CC07TH

Time 3 hours

Maximum Marks 75

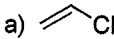
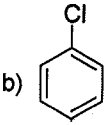
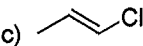
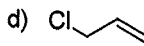
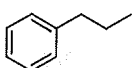
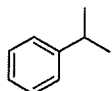
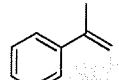
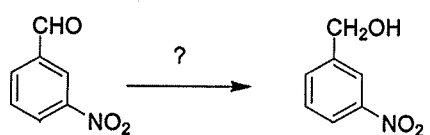
Abbreviations Used

CLO- Course Outcome, PLO- Program Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

Section A

Very Short Type Questions (attempt all)

(10x2=20Marks)

Q. No	Question	BTL	CLO	PLO
A1.	What is carbylamine test?	1	1	1
A2.	How do you distinguish 1°/2°/3° alcohols?	4	2	1/2
A3.	Depict the williamson's synthesis.	1	2	2/3
A4.	How to prepare benzonitrile from benzenediazonium chloride. Write the complete reaction.	2	3	3
A5.	What is Urotropine? State it's industrial method of preparation.	3	6	6
A6.	Which one of the following is most reactive towards nucleophilic substitution reaction?	2	4	3/4
	a)  b)  c)  d) 			
A7.	Which is the major product formed in the following reaction:	4	1	1
	 +  $\xrightarrow{\text{AlCl}_3}$?			
	(A)  (B)  (C)  (D) 			
A8.	State the Henry reaction with suitable example.	2	2	3
A9.	What is Schotten-Baumann reaction?	1	2	1-2
A10.		2	5	3-5

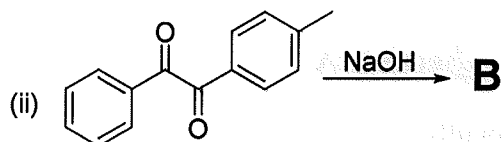
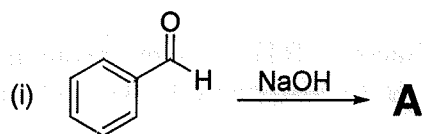
Section B

Long Type questions (Attempt **any two** out four)

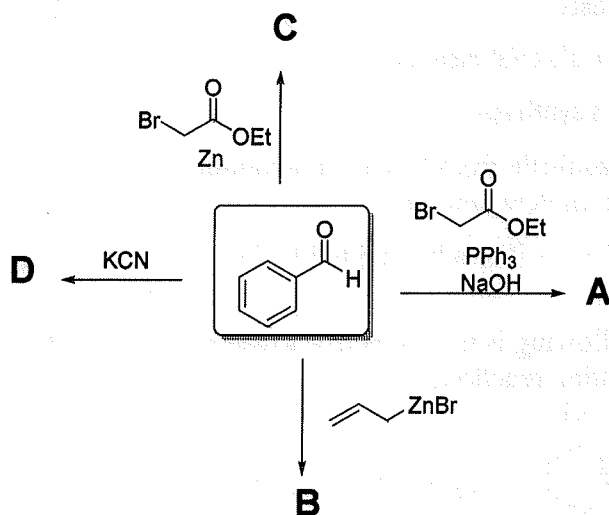
(10x2=20 marks)

Q. No	Question	BTL	CLO	PLO
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- B1.** Identify the products (A & B) formed in the following reactions with suitable mechanism: 6 2/3 3



- B2.** Identify the name reactions of the following conversions and explain the product formation with suitable mechanism: 4 2-4 3-5



- B3.** Write a short note on the following: 3/5 5 4/5

- i) Bouvaelt-Blanc Reduction
- ii) Oxidative cleavage of 1,2-diols by NaIO₄

- B4** Write a short note on the following: 5/6 5/6 6

- (i) Baeyer Villiger oxidation
- (ii) Mannich reaction

Section C

Short Type questions. (Attempt all questions)

(7x5=35 marks)

Q.NO	Questions	BTL	CLO	PLO
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- | | | | | |
|-----|---|-----|-----|---|
| C1. | Haloalkanes react with KCN to form alkyl cyanides while with AgCN forms isocyanides. Explain. | 3/4 | 2/4 | 3 |
|-----|---|-----|-----|---|

OR

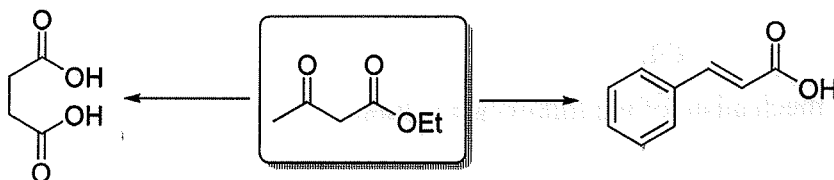
Why do aryl halides not undergo nucleophilic substitutions under normal conditions? Explain the conditions under which aromatic nucleophilic substitutions are possible.

- | | | | | |
|-----|--|-----|-----|---|
| C2. | Explain the suitable oxidative method for the formation of <i>trans</i> - 1,2-diols from olefin. | 2/3 | 2/5 | 4 |
|-----|--|-----|-----|---|

OR

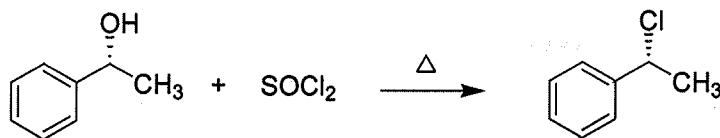
Explain the Darzen's epoxidation with suitable mechanism.

- | | | | | |
|-----|--|-----|-----|-----|
| C3. | How do you prepare Cinnamic acid and succinic acid from ethylacetoacetate? | 3/4 | 3-5 | 5/6 |
|-----|--|-----|-----|-----|



OR

Predict the type of substitution involved in the following reaction, and explain with suitable mechanism



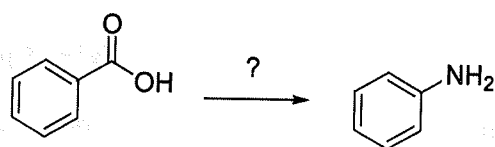
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|-----|--|-----|-----|-----|
| C4. | How do you distinguish and separate 1°/2°/3° amines with Hinsberg reagent? Explain the reactions involved in it. | 4/5 | 2/3 | 2/5 |
|-----|--|-----|-----|-----|

OR

Differentiate between Claisen and Dieckmann condensation reactions.

C5. Complete the following conversion with suitable Mechanism.

6 6 2



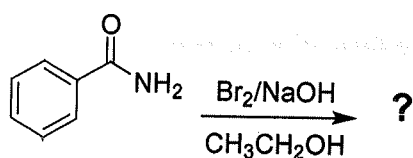
OR

What is homologation of carboxylic acids? Explain with suitable mechanism.

C6. Why do Hofmann elimination (Hofmann Rule) doesn't follow Zaitsev's rule? Explain with suitable mechanism.

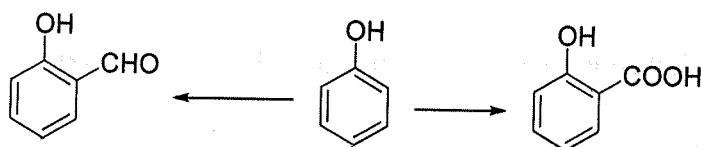
6 4/6 3

OR



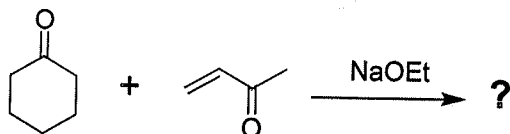
C7. Complete the following conversions with suitable mechanism:

3/4 3-5 3/4



OR

Outline the mechanism of the following reaction:



.....XXXX.....