

B.Sc. - M.Sc. INTEGRATED PROGRAM IN CHEMISTRY**DEPARTMENT OF CHEMISTRY, SCLS****SEMESTER-III EXAMINATIONS-2024 (BACKLOG)**

PAPER CODE: BCH-CC07TH

PAPER TITLE: ORGANIC CHEMISTRY-II (HALOGENS, OXYGEN AND NITROGEN-CONTAINING FUNCTIONAL GROUPS)*(Write your Roll No. at the top immediately on receipt of this question paper)***Note:** This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; Section B: Answer any 3 out of 4; Section C: Answer all the questions, each question has an internal choice

Abbreviations Used

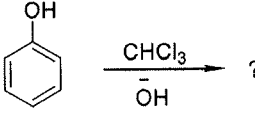
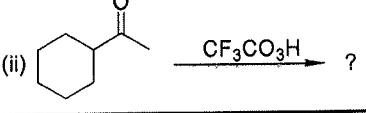
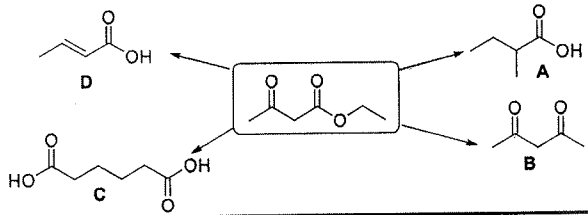
CLO- Course Outcome, PLO- Program Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

SECTION A**Very Short Type Questions****(10x2= 20 marks)**

Q. No	Question	Marks	BTL	CLO	PLO
1.	Arrange the following compounds in order of their reactivity towards S_N2 displacement: (i) 1-Bromo-3-methylbutane (ii) 2-Bromo-2-methylbutane (iii) 3-Bromo-2-methylbutane	2	4	2	1/2
2.	$\text{PhMgBr} + \text{C}_6\text{H}_5\text{CHO} \longrightarrow ?$	2	3	6	6
3.	Arrange the following alcohols in order of their reactivity towards gaseous HBr : (i) 2-Butanol (ii) 2-methyl-1-propanol (iii) 2-Methyl-2-propanol	2	4	2	1/2
4.	Complete the following reaction: $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{HBr}} ? \xrightarrow{\text{CN}^-} ?$	2	2	5	3-5
5.	$\begin{array}{c} \text{CH}_3 \quad \text{Ph} \\ \quad \\ \text{H}_3\text{C}-\text{C}-\text{C}-\text{Ph} \\ \quad \\ \text{OH} \quad \text{OH} \end{array} \xrightarrow[\text{Heat}]{\text{dilute H}_2\text{SO}_4} ?$	2	5/6	5/6	6
6.	Explain the role of CN^- ion during Benzoin Condensation.	2	3	5/6	6
7.	Explain keto-enol tautomerism. Why keto form is more stable than enol?	2	4	1	1
8.	$\text{C}_6\text{H}_5\text{CHO} + (\text{CH}_3\text{CO})_2\text{O} \xrightarrow{\text{C}_2\text{H}_5\text{ONa}} ?$	2	3	6	6
9.	$\text{CH}_3\text{CH}_2\text{COOH} + \text{Br}_2 \xrightarrow{\text{Red P}} ?$	2	3	6	6
10.	What is an active methylene group? Give two examples.	2	1	2	1-2

SECTION B**Long type Questions (Attempt any two out of four)****(2x10=20 marks)**

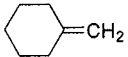
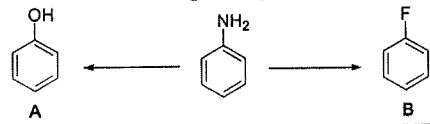
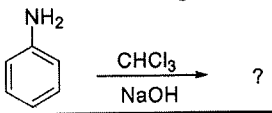
Q. No	Question	Marks	BTL	CLO	PLO
1.	Explain the following reactions with their mechanism: (i) Benzil-Benzilic acid rearrangement (ii) Perkin reaction	10	6	2/3	3
2.	Identify the products formed in the following reactions and explain mechanism:	10	5/6	5/6	6

	(i)  (ii) 				
3.	Explain the synthesis of following compounds (A-D) starting from Ethylacetoacetate: 	10	4	2-4	3-5
4.	Explain the following reactions with their mechanism: (i) Beckmann Rearrangement (ii) Reformatsky reaction	10	6	2/3	3

SECTION C

Short-type Questions. (Attempt all questions)

(7*5=35 marks)

Q. No	Question	Marks	BTL	CLO	PLO
1.	(a) Arrange the following carboxylic acid derivatives in the increasing order of their reactivity towards nucleophilic substitution reaction and give explanation. $\text{H}_3\text{C}-\text{C}(=\text{O})-\text{O}-\text{C}_2\text{H}_5$ $\text{H}_3\text{C}-\text{C}(=\text{O})-\text{Cl}$ $\text{H}_3\text{C}-\text{C}(=\text{O})-\text{O}-\text{C}(=\text{O})-\text{CH}_3$ $\text{H}_3\text{C}-\text{C}(=\text{O})-\text{NH}_2$ OR (b) Explain Claisen condensation reaction with mechanism.	5	3/4	2/4	3
2.	(a) Explain acidic and alkaline hydrolysis of esters with mechanism. OR (b) Explain Cannizzaro reaction with mechanism.	5	6	4/6	3
3.	(a) Write the sequence of reactions for the preparation of the following by Wittig reaction  OR (b) Explain Aldol condensation reaction with mechanism.	5	3/4	3-5	3/4
4.	(a) Differentiate between $\text{S}_\text{N}1$ and $\text{S}_\text{N}2$ Reactions. OR (b) Explain Curtius rearrangement with mechanism.	5	3/4	2/4	3
5.	(a) Explain why is o-nitrophenol weaker acid than p-nitrophenol? OR (b) Explain the following: (i) Hofmannbromamide degradation (ii) S_Ni Reaction	5	2	6	2
6.	How to distinguish between $1^\circ/2^\circ/3^\circ$ amines? Explain the reactions involved in it. OR How do you prepare the following compounds (A-B) from aniline? 	5	2/4	2-4	3-5
7.	(a) What is Gabriel phthalimide reaction? Explain with suitable example. OR Identify the product formed in the following reaction and explain mechanism 	5	2/3	2/5	4