

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Course: Advanced Organic Chemistry

Semester: I

Program: M.Sc Chemistry

Course Code: CHEM 7018

Time : 03 hrs.

Max. Marks: 100

Instructions:

1. Write your enrolment number on the top left of the question paper.
2. Do not write any thing else on the question paper except your enrolment number.
3. Attempt all parts of a question at one place only.
4. Internal choice is given for question number 4 of Section B and question number 2 of Section C only.

SECTION A
(5Qx4M=20Marks)

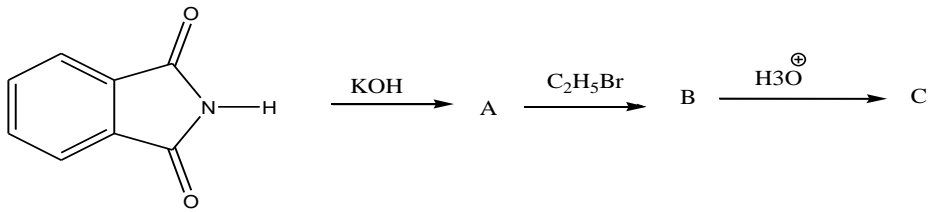
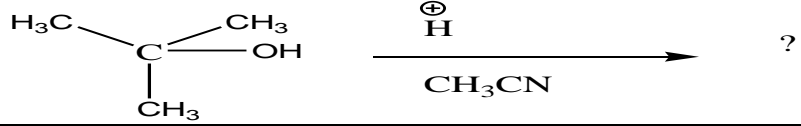
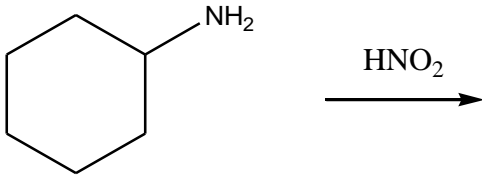
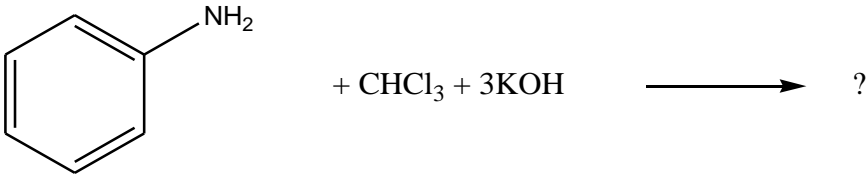
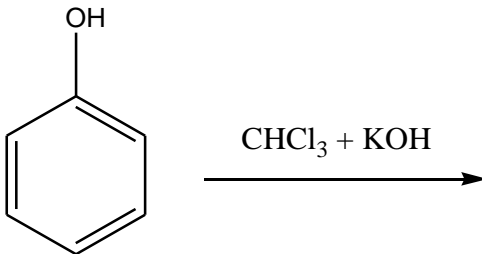
S. No.		Marks	CO
Q 1	Explain the basicity of primary amine, secondary amine and tertiary amine in water.	4	CO1
Q 2	Why is cycloheptatriene cation aromatic in nature?	4	CO2
Q 3	Explain Resonance with example.	4	CO1
Q 4	Illustrate reaction between an aldehyde and hydroxylamine in the presence of mineral acid.	4	CO1
Q 5	Why is the carbon-carbon bond distance in benzene in between the bond distance in ethane and ethane?	4	CO1

SECTION B
(4Qx10M= 40 Marks)

(Question No. 1, 2 and 3 are Compulsory); attempt any one from question no 4

Q 1	Write the product with mechanism: <chem>c1ccc(cc1)C=O + CC(=O)OC(=O)C >> [CH3COONa, 180C] A >> [H2O] B >> [Heat] C</chem>	10	CO3
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Q 2	Complete the reaction with mechanism: $\text{H}_3\text{C}-\text{C}(=\text{O})-\text{CH}_3 + \text{Br}-\text{CH}_2-\text{C}(=\text{O})-\text{OH} \xrightarrow{\text{Zn, C}_6\text{H}_6} \text{A} \xrightarrow{\text{H}_2\text{O} / \text{H}^+} \text{B} \xrightarrow{\text{Heat}} \text{C}$	10	CO2
Q 3	Complete the reaction with mechanism: $\begin{array}{c} \text{H}_3\text{C} \\ \\ \text{CH}_3-\text{N}-\text{CH} \\ \quad \\ \text{CH}_3 \quad \text{CH}_3 \\ \\ \text{CH}_3 \end{array} \xrightarrow[\text{H}_2\text{O}_2]{[\text{O}]} \text{A} \xrightarrow{\text{heat}} \text{B}$	10	CO3
Q 4	Elaborate the mechanism of following reaction: (i) $\text{H}_3\text{C}-\text{C}(=\text{O})-\text{H} \xrightarrow[\text{CH}_3\text{OH}]{\text{H}^+} \text{A} \xrightarrow[\text{CH}_3\text{OH}]{\text{H}^+} \text{B}$ (ii) $2\text{CH}_3\text{CHO} \xrightarrow{\text{dilute NaOH}}$ OR (i) $\text{Cyclopentane ring}-\text{C}(\text{OH})_2-\text{C}(\text{OH})_2-\text{Cyclopentane ring} \xrightarrow{\text{H}^+}$ (ii) $\text{C}_6\text{H}_5\text{ONa} + \text{CO}_2 \xrightarrow[5-7 \text{ atm. pressure}]{150^\circ\text{C}} ?$	6+4	CO2
SECTION-C (2Qx20M=40 Marks) (Question No. 1 Compulsory); attempt any one from question no 2			
Q 1	Elucidate the product with mechanism:	10+ 10	CO3

	<p>(i)</p>  <p>(ii)</p> 		
<p>Q 2</p>	<p>Complete the reaction with mechanism:</p> <p>(i)</p>  <p>(ii)</p>  <p style="text-align: center;">OR</p> <p>(i)</p>  <p>(ii)</p> <p>(a) $C_6H_6 + CH_3CH_2CH_2Cl \xrightarrow{\text{Anhy. } AlCl_3}$</p> <p>(b) $CH_3CH_2CN \xrightarrow{CH_3CH_2MgBr / H_2O}$</p>	<p>10+10</p>	<p>CO3</p>