

<b>Name:</b>	 <b>UPES</b> UNIVERSITY WITH A PURPOSE
<b>Enrolment No:</b>	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, Jan 2021**

**Course: M.Sc.(H) Chemistry**  
**Program: Advanced Organic chemistry**  
**Course Code: CHEM7018**


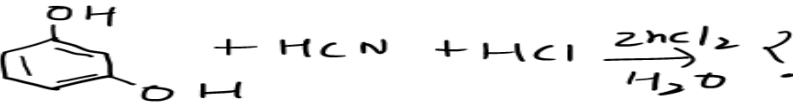
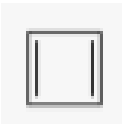


**Semester: I**  
**Time: 03 hrs.**  
**Max. Marks: 1**

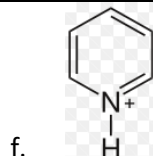
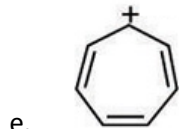
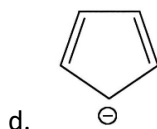
**Instructions: Read the instructions given below carefully:**  
**All questions are compulsory.**

**SECTION A**

S. No.			Marks	CO
Q 1	a	The IUPAC name of the compound $\text{CH}_3\text{CH}_2\text{OCH}_3$ is (i) Ethyl methanol (ii) Methyl ethanol (iii) Ethoxy methane (iv) Methoxy ethane	2	CO1
	b	The common name of $\text{CH}_2=\text{CH}-\text{CHO}$ is (i) Vinyl aldehyde (ii) Allyl aldehyde (iii) Acrolein (iv) Propionaldehyde	2	CO1
	c	State True/False The IUPAC name of $\text{CH}_3\text{CONHCH}_3$ is N-methyl acetamide.	1	CO1
Q 2	a	A student heats ethanol with acidified potassium manganite (VII) solution. Ethanoic acid forms in the reaction. What is the colour change seen in this reaction? (i) colourless to orange (ii) colourless to purple (iii) orange to colourless (iv) purple to colourless	2	CO3
	b	When phenol is treated with excess bromine water it gives (i) m-bromophenol (ii) o- and p-bromophenol (iii) 2,4-dibromophenol (iv) 2,4,6-tribromophenol	2	CO3
	c	State True/False On nitration of benzaldehyde, $\text{NO}_2$ group occupies o,p- position of benzaldehyde.	1	CO3
Q 3	a	Dehydration of alcohol is an example of a. addition reaction b. elimination reaction c. substitution reaction d. redox reaction	2	CO3

	b	Acetic acid on heating at high temperature forms (i) Succinic anhydride (ii) Acetic anhydride (iii) Acetyl acetate (iv) Methane	2	CO3
	c	State True/False The least basic compound among $\text{CH}_3\text{NH}_2$ , $(\text{CH}_3)_2\text{NH}$ , $\text{NH}_3$ , $\text{C}_6\text{H}_5\text{NH}_2$ is $\text{NH}_3$ .	1	CO3
Q 4	a	An organic compound A containing C, H and O has a pleasant odour with boiling point of $78^\circ\text{C}$ . On boiling A with concentrated $\text{H}_2\text{SO}_4$ , a colourless gas is produced which decolourises bromine water and alkaline $\text{KMnO}_4$ . The organic liquid A is (i) $\text{C}_2\text{H}_5\text{OH}$ (ii) $\text{CH}_3\text{OH}$ (iii) $\text{CH}_3\text{OCH}_3$ (iv) $\text{CH}_3\text{COOH}$	2	CO3
	b	Catalytic dehydrogenation of a primary alcohol gives a (i) Ketone (ii) Aldehyde (iii) Alkene (iv) ester	2	CO3
	c	State True/False Nitrous acid is used as catalyst for the esterification of carboxylic acid and alcohol?	1	CO3
Q 5	a	Chloro ethane reacts with X to form diethyl ether. What is X? (i) $\text{NaOH}$ (ii) $\text{C}_2\text{H}_5\text{ONa}$ (iii) $\text{H}_2\text{SO}_4$ (iv) $\text{Na}_2\text{S}_2\text{O}_3$	2	CO3
	b	Select the acetylating agent (i) $\text{CH}_3\text{COCl}$ (ii) $(\text{CH}_3\text{CO})_2\text{O}$ (iii) Both (iv) None	2	CO3
	c	State True/False $\text{C}_2\text{H}_5\text{OH}$ will not give iodoform test.	1	CO3
Q 6	A	The most convenient method to prepare primary amine containing one carbon atom less is (i) Gabriel phthalamide synthesis (ii) Reduction of nitroalkanes (iii) Hofmann bromamide reaction (iv) Reduction of cyanides	2	CO3
	b	Acetone can be reduced to propane in the presence of (i) $\text{Ni/Pt}$ (ii) $\text{Zn-Hg/conc. HCl}$ (iii) $\text{LiAlH}_4$ (iv) All	2	CO3
	c	State True/False	1	CO3

	LiAlH <sub>4</sub> does not reduce CH <sub>2</sub> =CH <sub>2</sub> .		
<b>SECTION B</b>			
Q 1	<p>Give reasons:</p> <p>a. n-heptane has higher melting point than n-octane.</p> <p>b. Acetyl chloride is more reactive than acetic acid.</p> <p>c. Acetamide is less basic than ethyl amine.</p>	3+3+4	CO1
Q 2	<p>Complete the reactions with mechanism:</p> <p></p> <p></p>	10	CO2
Q 3	<p>What happens when</p> <p>a. Glycerol reacts with oxalic acid</p> <p>b. Phthalic anhydride reacts with phenol in the presence of conc. H<sub>2</sub>SO<sub>4</sub>.</p> <p>c. Acetamide is heated with Br<sub>2</sub> and aqueous KOH.</p>	4+4+2	CO3
Q 4	<p>Write down the mechanism of the following reactions:</p> <p>a. Allyl phenyl ether is heated at 200°C.</p> <p>b. Benzaldehyde reacts with acetic anhydride in the presence of sodium acetate.</p>	10	CO2
Q 5	<p>State Huckel rule and classify the following species into aromatic or antiaromatic</p> <p>a. </p> <p>b. </p> <p>c. </p>	10	CO1



**SECTION C**

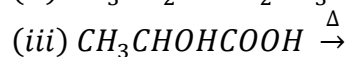
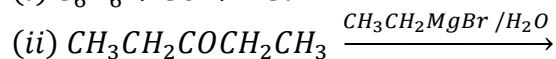
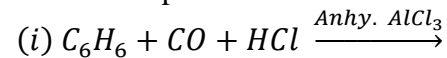
Q 1

Conversions:

- (i) Ethylene to acetone
- (ii) Ethyl chloride to acrylic acid
- (iii) Ethane to succinic anhydride
- (iv) Etnyl amine to n-propyl amine
- (v) Acetylene to acetophenone

OR

a. Predict the products from the following reactions:



- b. An ester  $C_8H_{16}O_2$  was hydrolyzed by heating with water when an acid 'A' and an alcohol 'B' were obtained. Oxidation of B with sodium dichromate produced another acid 'C'. Both 'A' and 'C', on fusion with solid NaOH yield propane. What is the structure of the original ester? Write all the reactions.
- c. An organic compound 'A' with molecular formula  $C_3H_6O$  reacts with HCN to form 'B'. 'B' on hydrolysis forms another compound 'C' with on dehydration forms crotonic acid. Deduce the formula of all the compounds and complete the reaction series.

20

CO3

7+7+6