
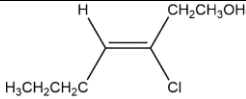
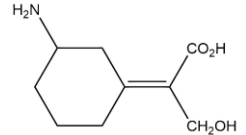
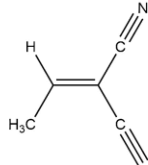


Name:			
Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, December 2022			
Course: Atomic structure, bonding, general organic chemistry and aliphatic hydrocarbon		Semester : I	
Program: B.Sc.(H) (Phys/Maths/Geology)		Time : 03 hrs.	
Course Code: CHEM-1007G		Max. Marks : 100	
Instructions:			
1) Read all the below mentioned instructions carefully and follow them strictly:			
2) Mention Roll No. at the top of the question paper.			
3) ATTEMPT ALL THE PARTS OF A QUESTION AT ONE PLACE ONLY.			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	Write the main features of molecular orbital theory.	4	CO2
Q 2	Discuss Heisenberg's uncertainty principle with example.	4	CO2
Q 3	What are enantiomers? Explain the general characteristics of enantiomers.	4	CO1
Q 4	Discuss the different types of reactions with suitable examples.	4	CO1
Q 5	Write the Corey House synthesis for the preparation of ethane and propane.	4	CO3
SECTION B (4Qx10M= 40 Marks)			
Q 6	i) What is Born Lande Equation? How it is related to lattice energy? ii) Which is more ionic and why? LiCl or CsCl. Explain the concept for your choice.	5+5	CO1
Q 7	Based on Valence shell electron pair repulsion theory, comment on the shape of following molecules i) NF ₃ ii) H ₂ O iii) SF ₆ i) ICl ₃	10	CO3
Q 8	What is Geometrical isomerism. Give the nomenclature E and Z to the following compounds.	4+2+2+2	CO1

	<p>A) </p> <p>B) </p> <p>C) </p>		
Q 9	<p>How is ethene formed by the dehydrohalogenation and dehalogenation reaction from alkyl halides. Explain the various oxidation reactions shown by the $\text{CH}_3\text{-CH=CH-CH}_3$.</p> <p style="text-align: center;">OR</p> <p>Complete the following reactions:</p> <p>i) $\text{CH}_3\text{COOH} + \text{NaOH} \longrightarrow$</p> <p>ii) $\text{CH}_3\text{MgX} + \text{H}_2\text{O} \longrightarrow$</p> <p>iii) $\text{RCOONa} \xrightarrow{\text{Electrolysis}}$</p> <p>iv) $\text{CH}_4 + \text{Cl}_2 \longrightarrow$</p>	10	CO2
SECTION-C (2Qx20M=40 Marks)			
Q 10	<p>Write the short notes on</p> <p>i) Aromatization of alkanes.</p> <p>ii) Hydration of alkynes.</p> <p>iii) Ozonolysis of alkenes.</p> <p>iv) Bromination of ethene with mechanism.</p>	5+5+5+5	CO3
Q 11	<p>i) Write molecular orbital configuration of the species N_2, N_2^+, N_2^- and N_2^{-2} and calculate their bond order.</p> <p>ii) Elaborate VSEPR (valence shell electron pair repulsion) theory with example.</p> <p>iii) Write general characteristics of ionic compounds.</p> <p style="text-align: center;">OR</p> <p>i) Draw Molecular orbital diagram for C_2^-, Comment on its magnetic behaviour.</p> <p>ii) Draw Lewis dot structure for the following: a) NaCl b) H_2S c) CaCl_2 d) NH_3</p>	8+8+6	CO2

	iii)	Write salient features of Molecular orbital theory. What are Bonding and Antibonding orbitals, how are they formed?		
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