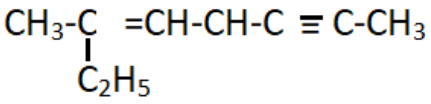
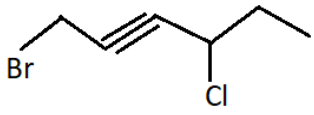
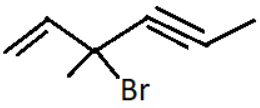
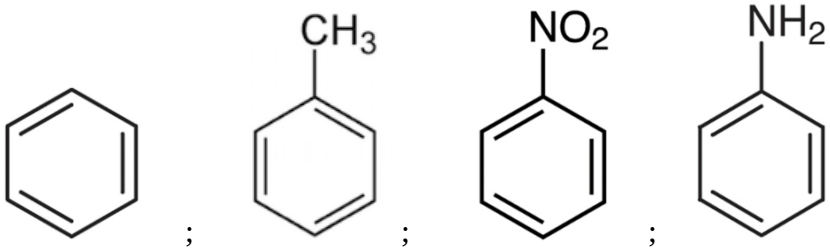
Name: **Enrolment No:**	

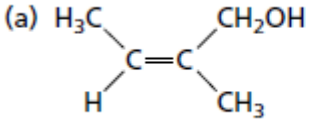
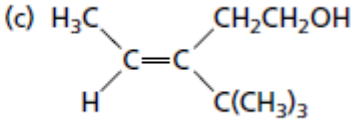
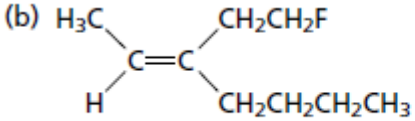
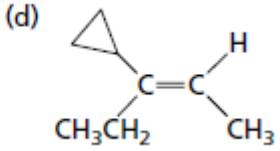
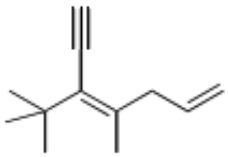
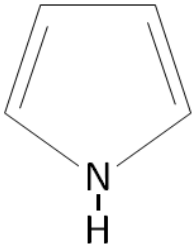
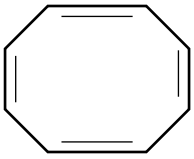
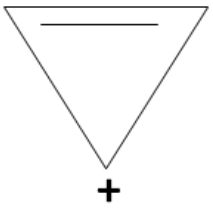
UPES
End Semester Examination, May 2023

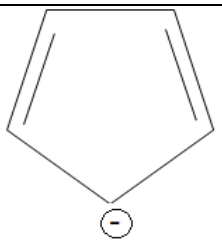
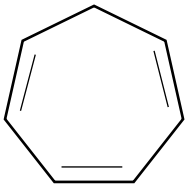
Course: Organic Chemistry I — **Semester : II**
Program: B.Sc. (H) Chemistry — **Time : 03 hrs.**
Course Code: CHEM 1005 — **Max. Marks: 100**

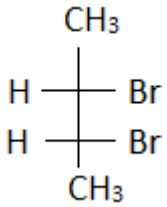
Instructions: Attempt all the questions.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Give IUPAC names of the following compounds: a)  b)  c)  d) 	**4**	**CO1**
Q 2	What happens when 1,3-butadiene reacts with Br_2. Also, discuss the mechanism.	**4**	**CO3**
Q 3	Arrange the following as directed: a)  (Increasing order of reactivity towards electrophilic substitution reactions)	**4**	**CO1**

	b) n-pentane, 2-methylbutane, 2,2-dimethylpropane (increasing order of boiling point)		
Q 4	Write down the structural isomers of heptane along with their names.	**4**	**CO1**
Q 5	Write the structural formula of a compound of molecular formula $C_4H_8Cl_2$ in which: (a) All the carbons belong to methylene groups. (b) None of the carbons belong to methylene groups.	**4**	**CO1**
SECTION B **(4Qx10M= 40 Marks)**			
Q 6	Determine the configuration of each of the following alkenes as Z or E as appropriate: (a)  (c)  (b)  (d)  (e) 	**10**	**CO1**
Q 7	Classify the following compounds into aromatic, antiaromatic and non-aromatic with proper justification:   	**10**	**CO2**

	 		
Q 8	Explain the reasons of the following: a) Chlorobenzene has strong electron withdrawing chlorine group but still o,p-directing in nature. b) Cyclohexane and higher cyclic alkanes are highly stable. c) Ethylene undergoes electrophilic addition reactions. d) Benzyl chloride is a highly reactive compound. e) Benzene undergoes electrophilic substitution reactions.	**10**	**CO2**
Q 9	Differentiate between E^1, E^2 and E^1cb mechanism using the suitable examples. OR Discuss the mechanism of the following reactions: a) Nitration of benzene b) Acetylation of benzene	**10**	**CO3**
SECTION-C (2Qx20M=40 Marks)			
Q 10	a) Write a short note on i) Ozonolysis reaction. ii) Reactivity of alkanes. b) Write down the following conversions: i) Ethane to BHC ii) Benzene sulphonic acid to toluene iii) 2-butyne to acetaldehyde iv) Ethane to ethylene glycol v) Ethyl chloride to acetone	**5+15**	**CO2**
Q 11	a) Which alkenes will be obtained on dehydration of each of the following alcohols: i) 3-Ethyl-3-pentanol ii) 2-Propanol iii) 1-Propanol iv) 2,3,3-Trimethyl-2-butanol v) 2,3-dimethyl-2-butanol	**10+4+6**	**CO2**

	b) Write structural formulae for all the alkenes that can be formed in the reaction of 2-bromobutane with potassium ethoxide. Explain the major and minor products with reason. c) How will you differentiate between 1-butyne and 2-butyne in lab. Explain with the help of suitable reactions. OR a) What happens when: i) Benzene reacts with Cl_2 in the presence of UV light. ii) Cyclohexane reacts with alkaline $KMnO_4$. iii) 1,3-butadiene reacts with ethylene. iv) Cyclopentanone reacts with Zn-Hg and conc. HCl. v) Propene reacts with $(CH_3COO)_2Hg$ followed by reaction with NaBH4. b) Discuss the stereochemistry of the following: i) Addition of Br_2 on cis-2-butene. ii) Elimination of HBr from 	**10+10**	