Enrolment No:	UPES UNIVERSITY WITH A PURPOSE

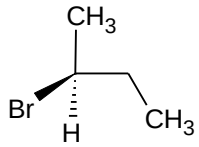
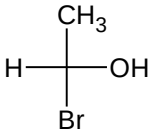
Course: CHEM-1007G (Chemistry) **(End Semester Examination Dec 2021)**
Programme: B.Sc (H) Geology/Mathematics **Semester: I**
Course Name: Atomic structure, bonding, General Organic chemistry & aliphatic hydrocarbons
Time: 03 hrs. **Max. Marks:100**

Instructions: Read all the below mentioned instructions carefully and follow them strictly:

1) **Write your enrolment number on the top left of the question paper**
2) **Do not write anything on the question paper except your enrolment number**
3) **Attempt all part of a question at one place only**

Section - A

1. Each Question will carry 4 Marks
2. Answer should be short
3. You have to very careful to write the answer.

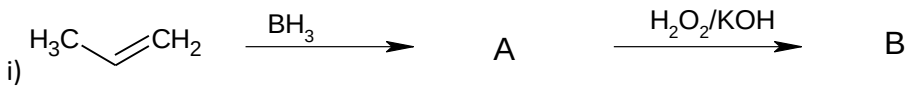
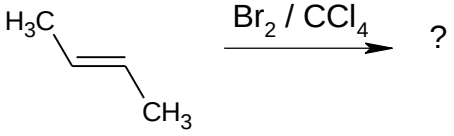
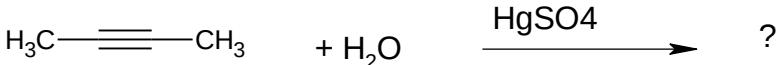
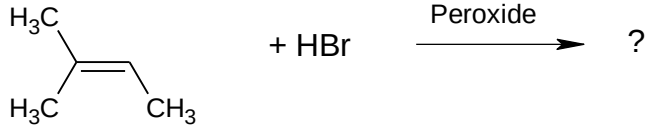
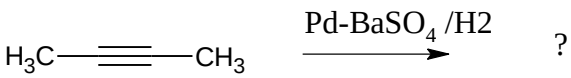
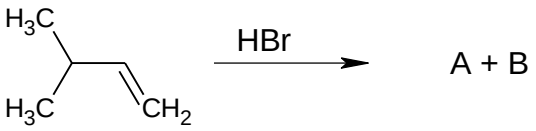
1.	Discuss Enantiomers and Diastereomers	**[4]**	**CO1**
2.	Assign R and S for the following compound  	**[4]**	**CO1**
3.	Explain Saytzeff's and Markovnikov's rule	**[4]**	**CO1**
4.	Write the main features of molecular orbital theory	**[4]**	**CO2**
5.	What do you mean by dual character of matter and discuss it with De Broglie's equation	**[4]**	**CO1**

SECTION-B

Instructions:

1. Each question will carry 10 marks
2. Write short/brief notes of 1-2 page answer.
3. Internal Choice is given in question 4

1	Explain the different conformations of butane. How will you account for difference in their relative stability	**[10]**	**CO3**
2	Complete the reaction	**[5+5]**	**CO3**

	i)  ii) 		
3	Elaborate the molecular orbital theory for CO molecules using appropriate illustration and also calculate the bond order	**[10]**	**CO2**
4	Complete the reaction with justification i)  ii)  **OR**	**[5+5]**	**CO3**
	i) Complete the reaction with justification  Birch's Reduction ? ii) 		

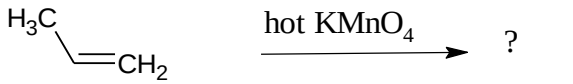
SECTION - C

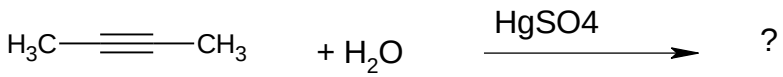
Instructions:

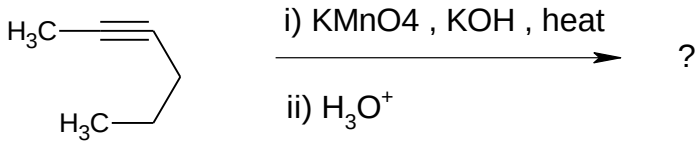
1. Each Question is of 20 marks

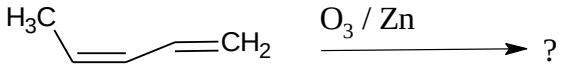
2. Internal choices is given in question 2

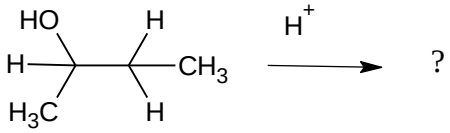
1.	i) Write the product of following reactions with explanation	**[12+4 +4]**	**CO3**











ii) Explain pinacole-pinacolone rearrangement with example

iii) Mention CIP rule for assigning priority to atoms

2.	i)	Using VSEPR theory, predict and draw the shapes of the following molecules BF_3, PCl_5, SF_4 and NH_3	**[8+8+4]**	**CO2**
	ii)	Write molecular orbital configuration of the species O_2, O_2^+, O_2^- and O_2^{-2} and calculate their bond order		
	iii)	Give the sequence in which the energy levels in an atom are filled with electrons and give electronic configuration for the elements having atomic number 11 and 17		
		OR		
	i)	Elaborate VSEPR(valence shell electron pair repulsion) theory with example		
	ii)	Outline a Born-Haber cycle for the formation of an ionic compound by taking example of sodium chloride		
	iii)	Explain the paramagnetic character of oxygen with the help of molecular orbital theory		

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