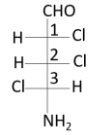
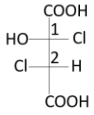
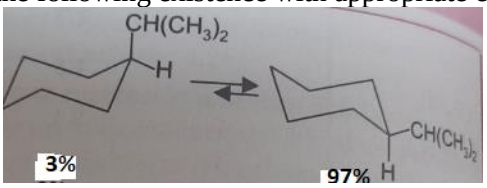
Name: **Enrolment No:**	

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

Course: Stereochemical approach to organic reaction and mechanism **Semester: II**
Program: MSc Chemistry **Time: 03 hrs.**
Course Code: CHEM7024P **Max. Marks: 100**

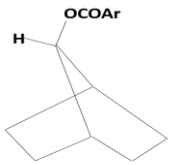
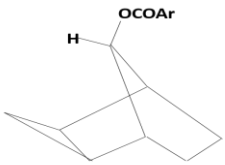
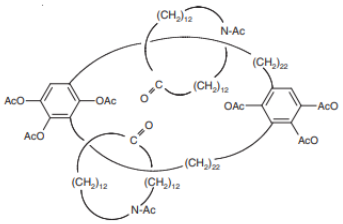
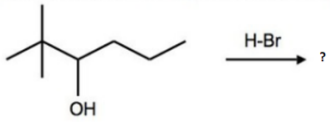
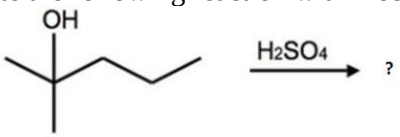
Instructions: Do all the parts of a question at one place.

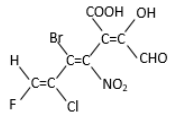
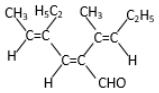
SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	What happens when acetyl azide is treated with 2-methyl propane in the presence of sunlight?	**4**	**CO1**
Q 2	Explain why: a. While converting benzene to toluene, an excess of benzene is used. b. Sulfonation of benzene is reversible while nitration is not.	**4**	**CO1**
Q 3	Identify symmetry elements in trans-dichloroethylene and cyclopropane.	**4**	**CO3**
Q 4	Assign R/S configurations to following compounds:  I  II	**4**	**CO3**
Q 5	Justify the following existence with appropriate explanation: 	**4**	**CO3**

SECTION B
(4Qx10M= 40 Marks)

Q 1	a. Which of the following molecules will undergo solvolysis at a faster rate and why?	**5+5**	**CO2**

	 I  II b. Propose a mechanism for conversion of bornyl chloride to camphene. Identify the intermediate involved in it and mention two specific features of this intermediate.		
Q 2	What do you understand by heterotopic ligands? How can it be confirmed if it is a heterotopic system? Discuss with suitable examples.	**10**	**CO4**
Q 3	To which class of compounds do the following molecules belong?  I  II Write two specific features of each of these molecules.	**10**	**CO3**
Q 4	Which of the conformers of cyclohexane is more stable and why? Discuss.	**10**	**CO3**
	SECTION-C **(2Qx20M=40 Marks)**		
Q 1	a. Complete the following reaction with mechanism:  b. Carry out dehydrohalogenation of dl-stilbene dibromide stereospecifically. c. Which precursor would be required to synthesize 2-p-aminophenyl-3-pentanone in acidic medium in the lab? Show the complete reaction with mechanism. **OR** a. Complete the following reaction with mechanism:  b. Carry out addition of bromine on fumaric acid stereospecifically. c. Why is norbornane selected for discussing bridgehead carbocations?	**6+7+7**	**CO2**

Q 2	a. Decide the isomerism (E/Z) in following compounds along each double bond:  I  II b. Write a short note on quasi racemates with example. c. Draw the structures of decalols and decalones. Also discuss about their conformational existence and optical active molecules. **OR** a. Draw the structures of following: i. (E)-3-chloro-4-methyl-3-hexene ii. (Z)-1-deuterio-2-chloropropene b. Write a note on prochiral centres with examples. c. Explain the conformations in cyclohexanone derivatives.	**6+8+6**	**CO3, CO4, CO3**