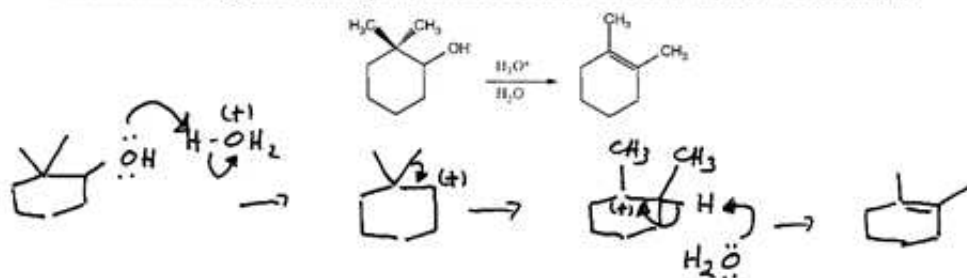
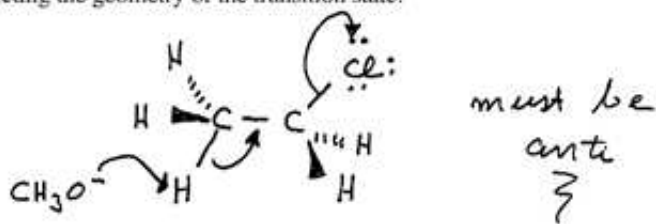


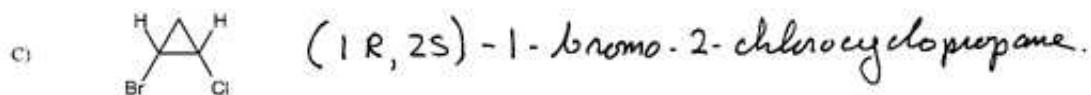
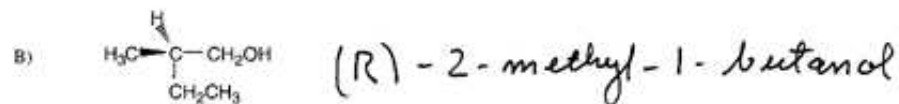
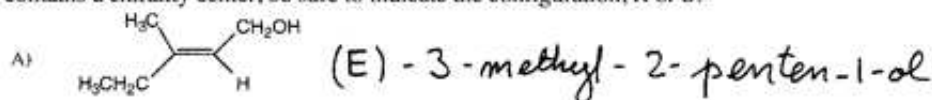
Problem 1. (10 points) Give the mechanistic scheme for the following reaction. Show each intermediate along the reaction path. Use curved arrows to show the flow of electrons.



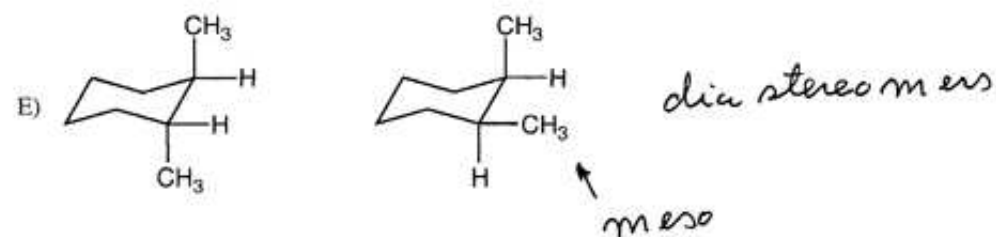
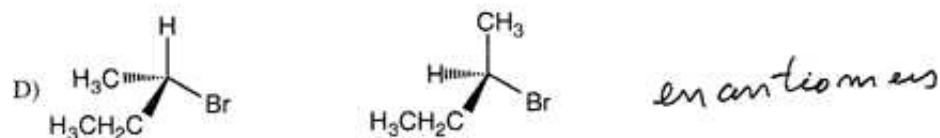
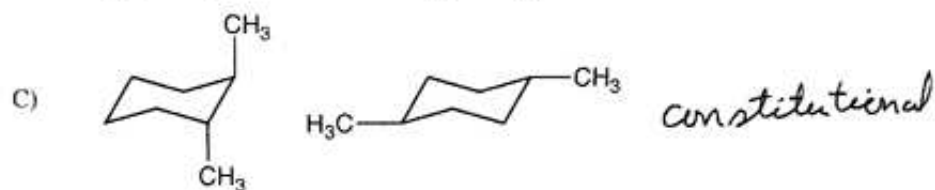
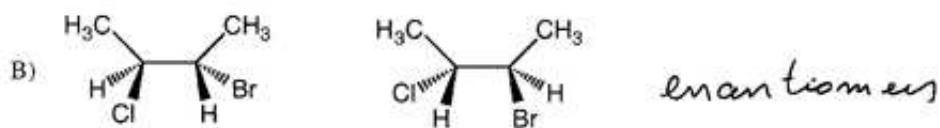
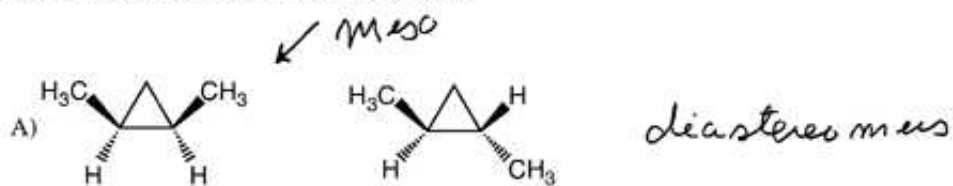
Problem 2. (5 points) For the conversion of ethyl chloride (chloroethane) to ethylene (ethene) in the presence of CH_3O^- , the reaction proceeds through an E_2 mechanism. Give the structure of the transition state for a E_2 mechanism and depict the flow of electrons with curved arrows. Be very clear in depicting the geometry of the transition state.



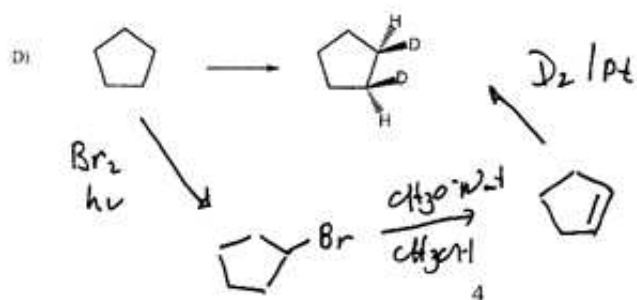
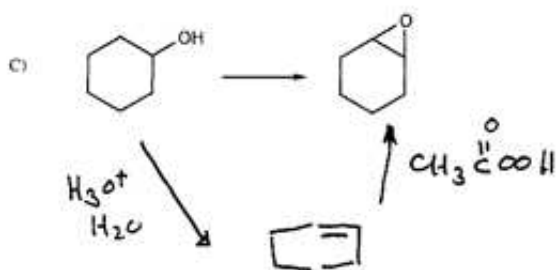
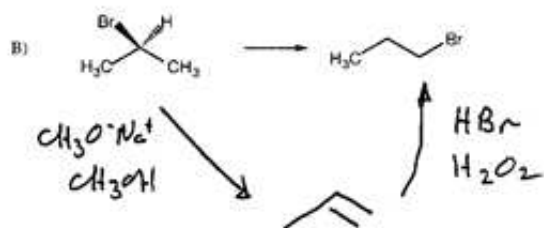
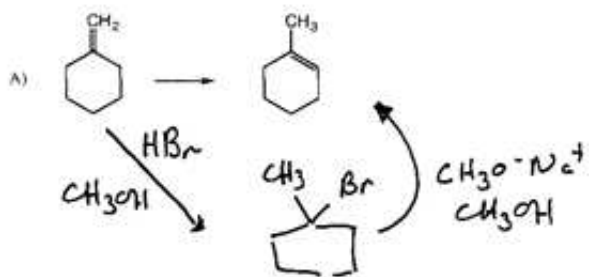
Problem 3. (10 points) Give the IUPAC name for the following compounds. If the molecule contains a chirality center, be sure to indicate the configuration, R or S.



Problem 4. (15 points) What are the stereochemical relationships between the following pairs of molecules - diastereomers, enantiomers, constitutional isomers or the same molecule. If a molecule is meso, please indicate that it is meso.



Problem 5. (20 points) Give the reagents that you would use to carry out the following transformations. For each reagent, show the product of the reaction. Do not give mechanisms.



Problem 6 (40 points) Give the products for the following reactions. If more than one product is formed and the products are isomers of one another, indicate what kind of isomers they are. If they are stereoisomers, indicate if they are enantiomers or diastereomers. If the product molecule is meso, please state so. Also, indicate if the product is chiral or achiral. If no reaction occurs please state so. **Circle your answers – only circled answers will be graded.**

