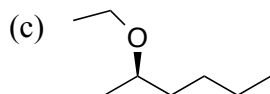
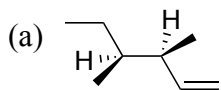
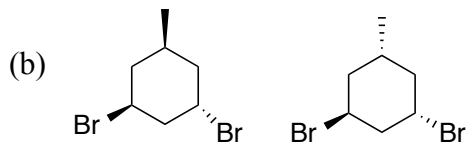
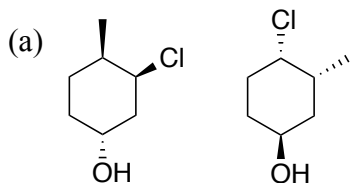




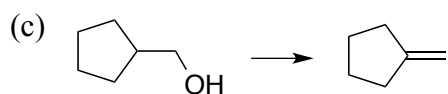
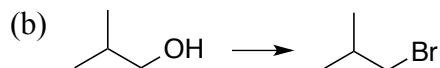
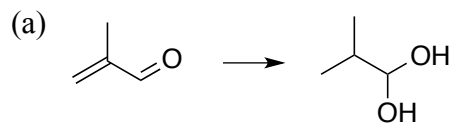
1. A) Give IUPAC names for the following compounds, including stereochemistry if appropriate (6 pts).



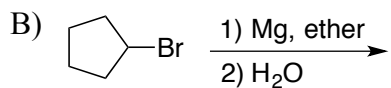
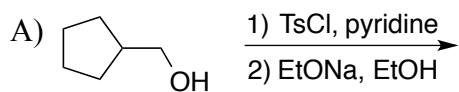
B) Describe the relationship between each pair of isomers (6 pts).

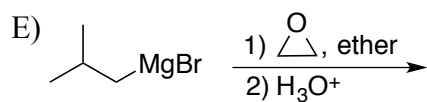
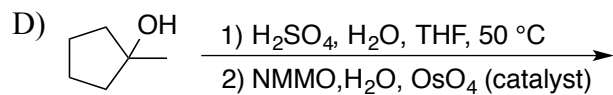
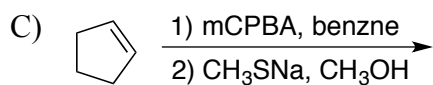


C) Indicate whether each of the following transformations is an oxidation, a reduction, or neither. (6 pts).

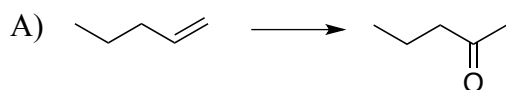


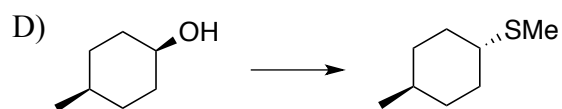
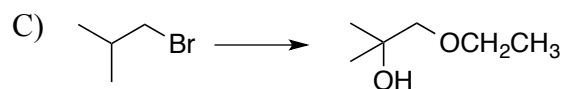
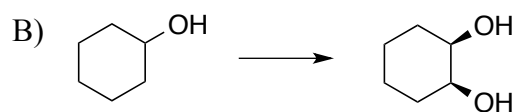
2. For each of the following reactions, provide the structures of all major products, including stereoisomers (20 pts).





3. Propose a multi-step synthesis for each target molecule from the indicated starting material. Show the reagents needed for each step and the product of each step (32 pts).





4. Using the curved arrow notation, suggest a mechanism for the formation of each of the products in the following reactions (30 pts).

