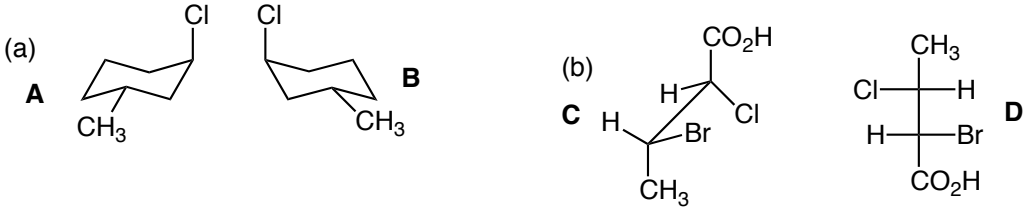
L. I. U.

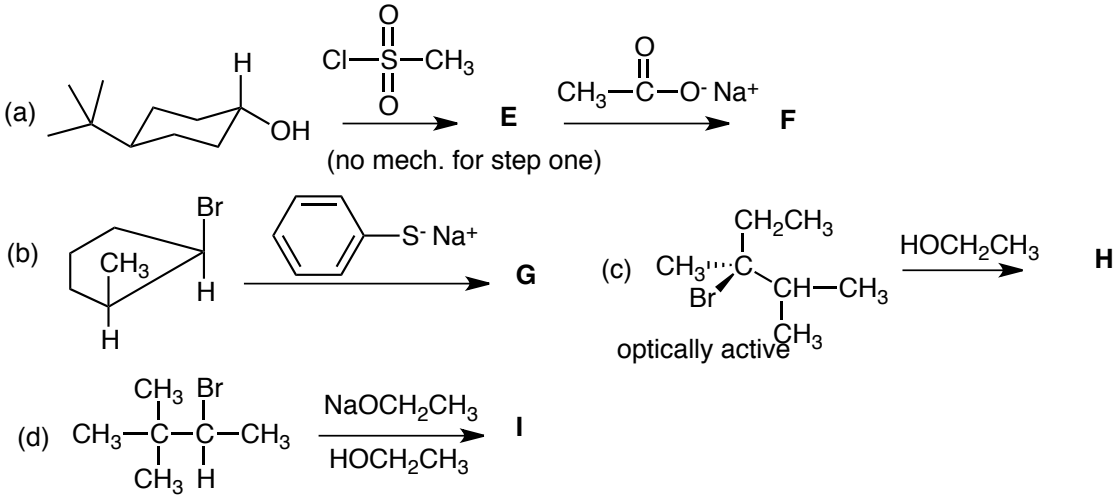
Chem. 121, Sect 012, Exam III Fall, 2012, 100 points

1. Draw all of the stereoisomers of 3-bromo-2-pentanol and assign the absolute configuration (R or S) to each chirality center. (13 pts).

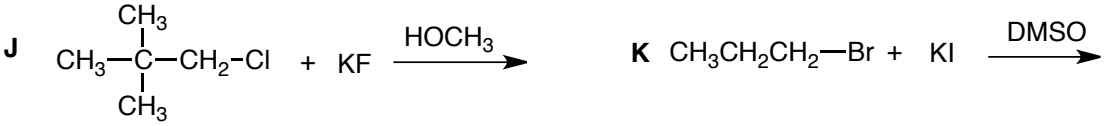
2. Give the relationship between the following molecules. They may be the same molecule, different molecules, constitutional isomers, enantiomers, or diastereomers. Show your work for partial credit. (12 pts)



3. Give the product(s) of the following reactions, giving the full reaction mechanism in each case and showing the correction stereochemistry where applicable. If there is more than one product expected, indicate the major and minor product. For (c) indicate whether or not the product is optically active. (40 pts)



4. Which reaction would proceed faster? Explain, paying careful attention to all reasons, including the substrate structure, the nature of the nucleophile, the leaving group and the effect of the solvent. Give the product of each reaction and indicate the reaction mechanism. (15 pts)



5. Synthesize **TWO** of the following molecules from starting materials given on the left as shown. Do all **three** for extra credit. (20 pts)