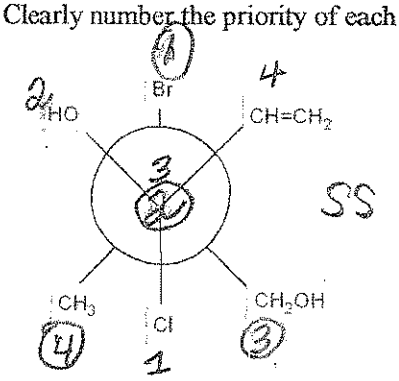
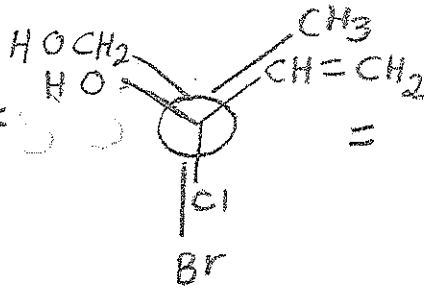
Fall 2011 Midterm I

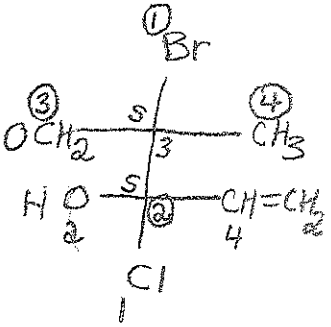
1. Determine the R or S configuration of each of the chiral centers in the molecule shown below. Clearly number the priority of each group. (10 points, 8 minutes)

Ch. 2 & 3



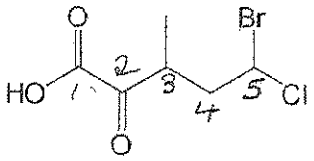
SS





2. Give the IUPAC name of the following molecule. (8 points, 6 minutes)

Ch. 2



5-bromo-5-chloro-3-methyl-2-oxo pentanoic acid

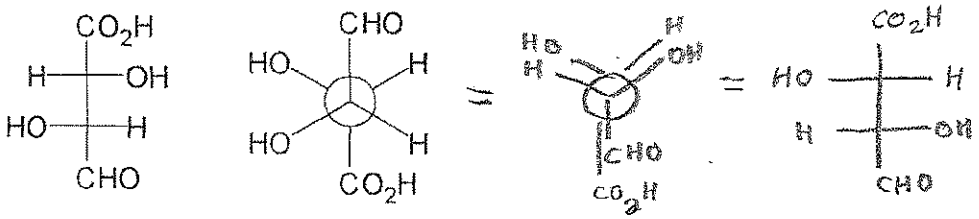
3. Show the product or products of the following reaction. (8 points, 6 minutes)

Ch. 4

$CH_3CH_2\text{—}NH^{\ominus}$ + $HOCH_2CH_2CO_2H$ ⟶ $CH_3CH_2NH_2$ + $HOCH_2CH_2CO_2^{\ominus}$

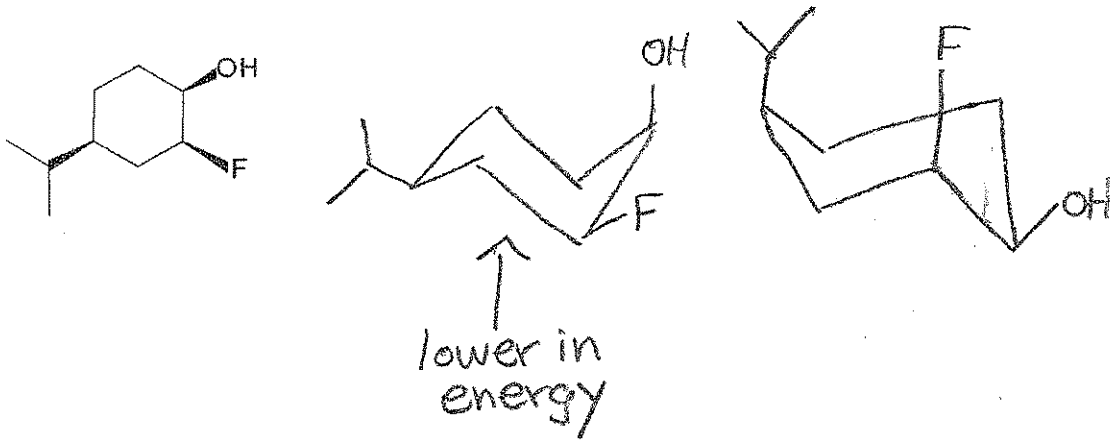
4. What is the relationship between these two molecules (identical, enantiomers, diasteriomers, unrelated)? *You are not required to determine R and S.* (8 points, 6 minutes)

Ch. 2/3



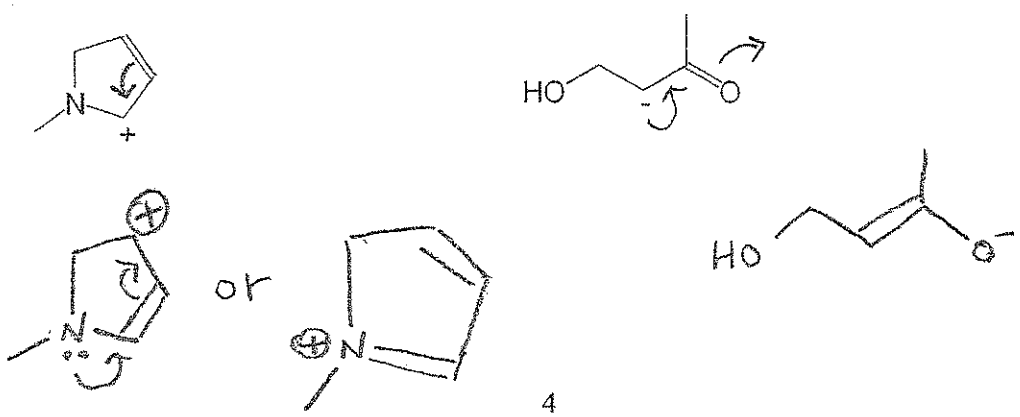
5. Draw both chair conformations of the following molecule. Indicate which conformer is lower in energy. (8 points, 6 minutes)

Ch. 2

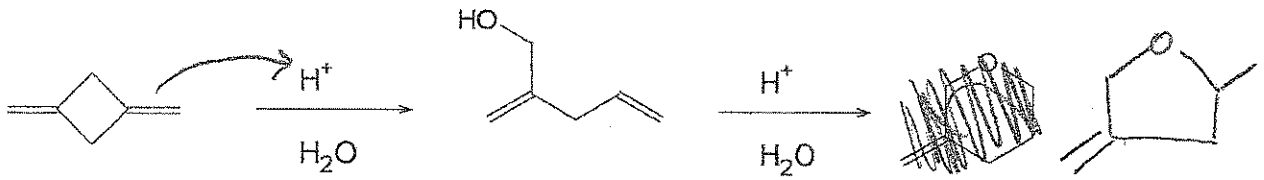


6. Draw one reasonable resonance structure for each of the following molecules. The resonance structure you draw should be a major contributor, a stable resonance structure. (8 points, 6 minutes)

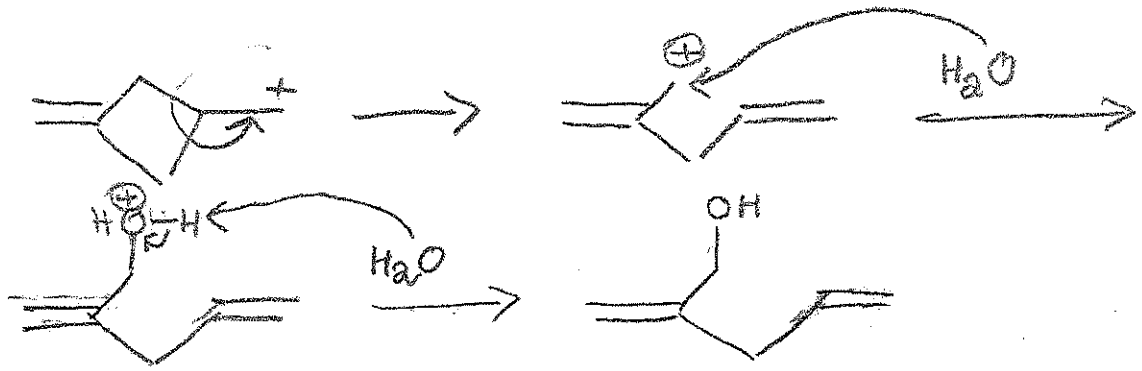
Ch. 1

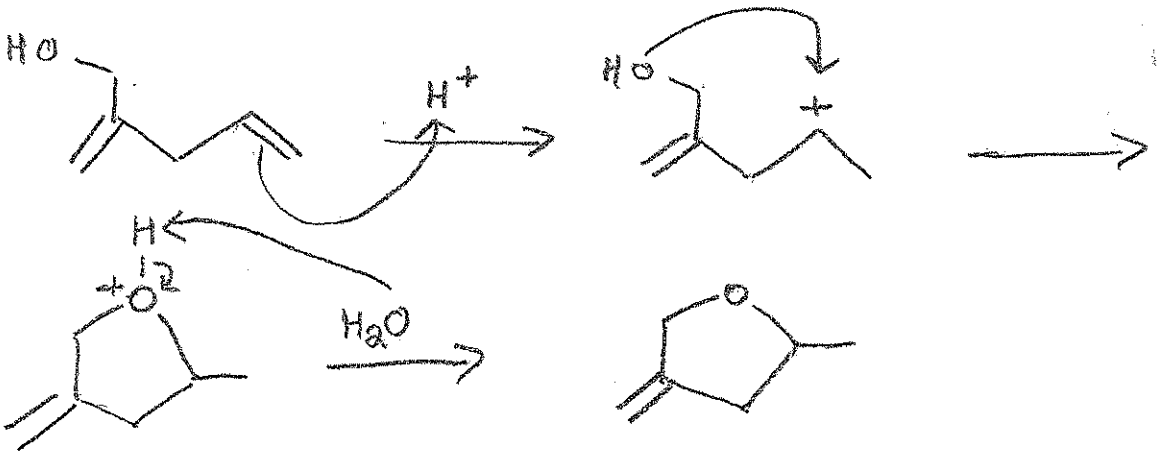


7. Give a step by step mechanism for each of the following TWO reactions. (15 points, 12 minutes)

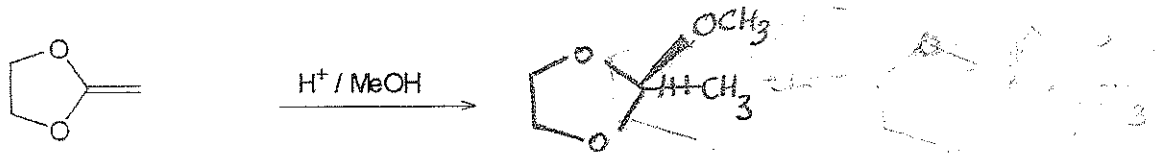


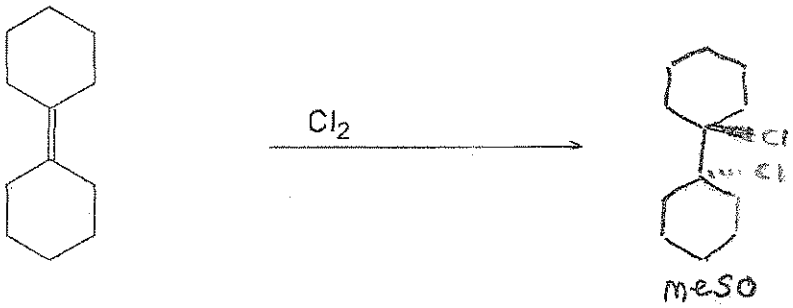
Ch.6/9



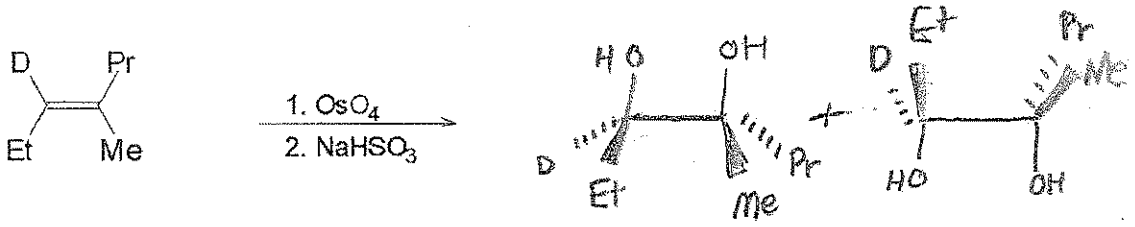


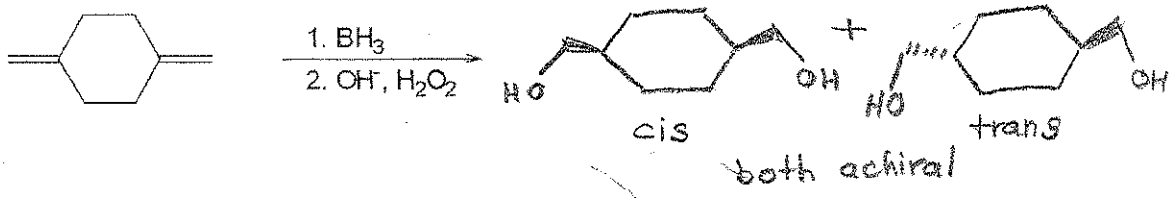
8. Give the product or products of each of the following reactions.
Be sure to include stereochemistry and to show all products that form. (7 pts each, 5 min each)

a. 

b. 

Ch. 3/6

c. 

d. 

e.