

Organic Chemistry I

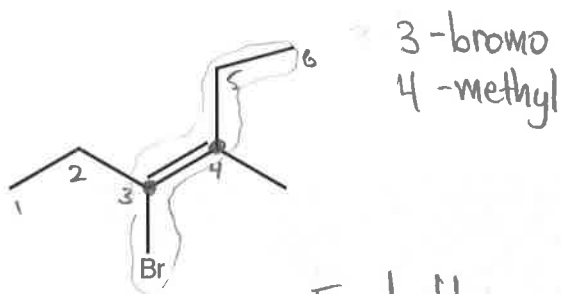
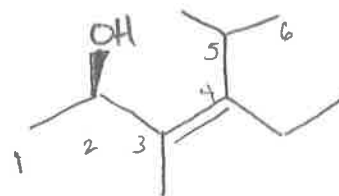
Exam 3



1.) Below is either the name of a structure or the structure itself: Give the correct name of the given structure or draw the correct structure for the given name.

1 stereocenter
1 double bond

(R, Z)-4-ethyl-3,5-dimethylhex-3-en-2-ol



3-bromo
4-methyl

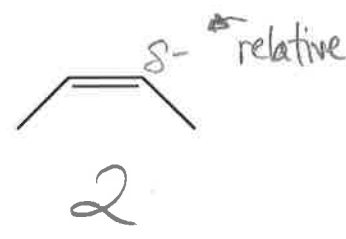
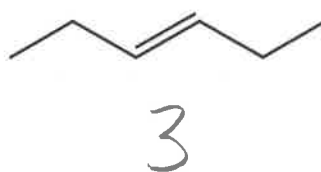
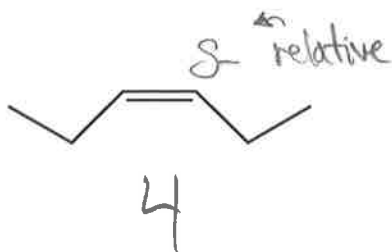
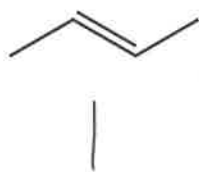
(E)-3-bromo-4-methylhex-3-ene

E double bond

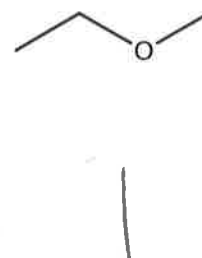
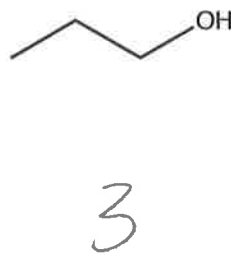
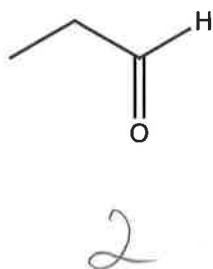
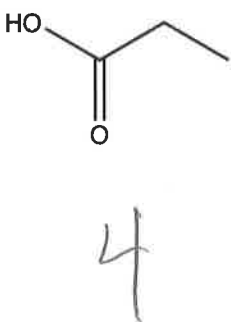
* Remember, with only one E/Z *
double or stereocenter, no # needed

2.) Below are 2 **different** sets of structures. In each set, rank the following structures from 1-4, giving 1 to the lowest boiling point and 4 to the highest boiling point.

a.)



b.)

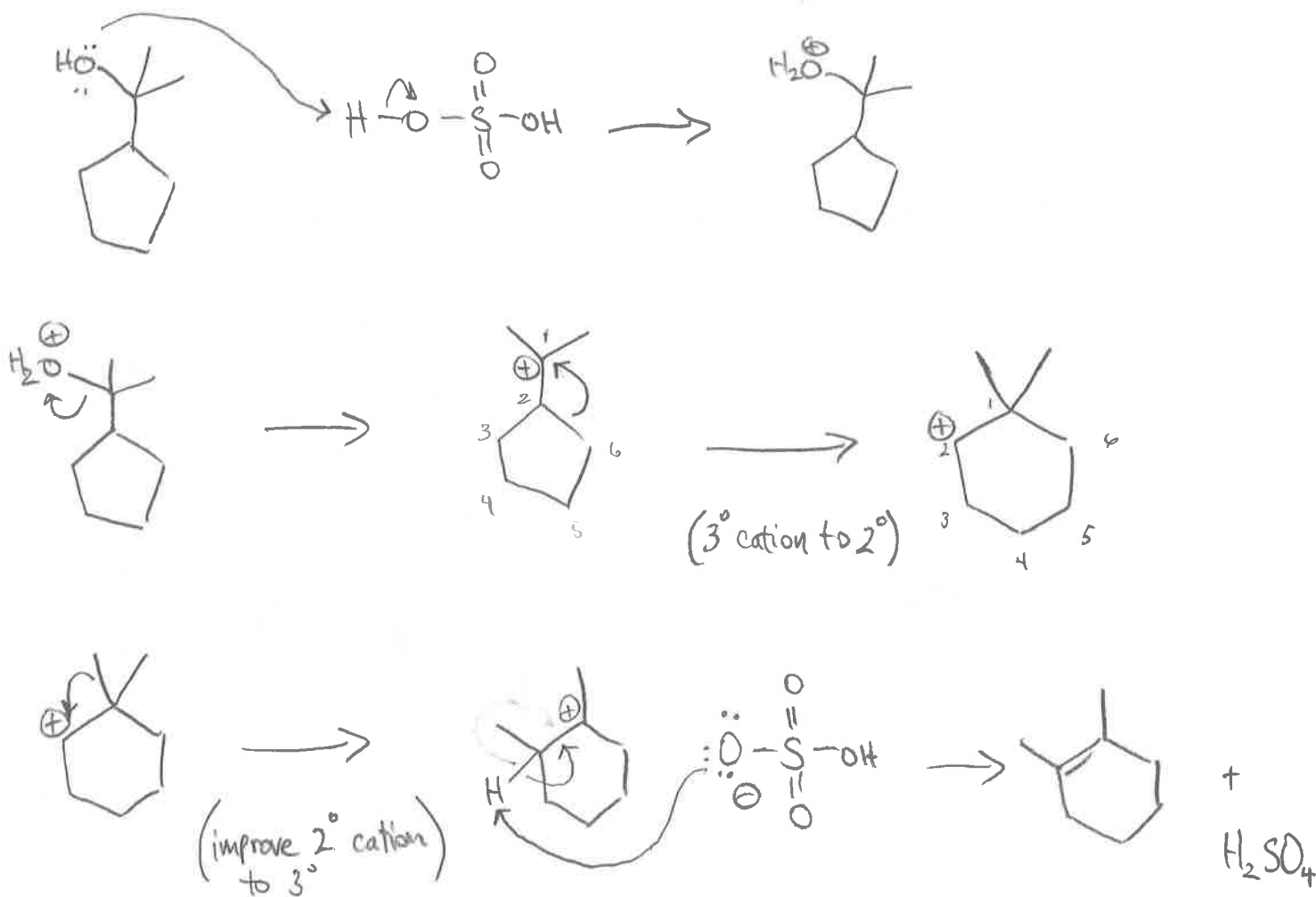
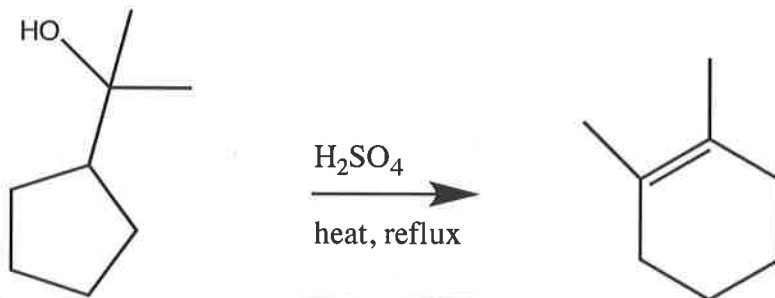


Most H-bonding

Can H-bond

2 things happen: ring expansion and methyl shift

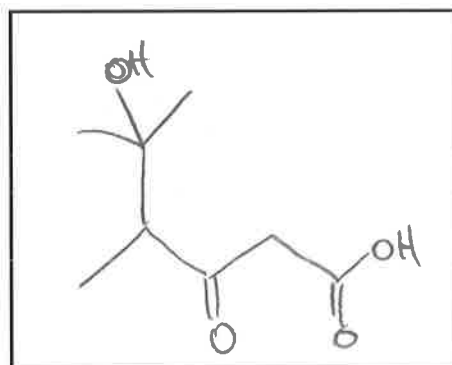
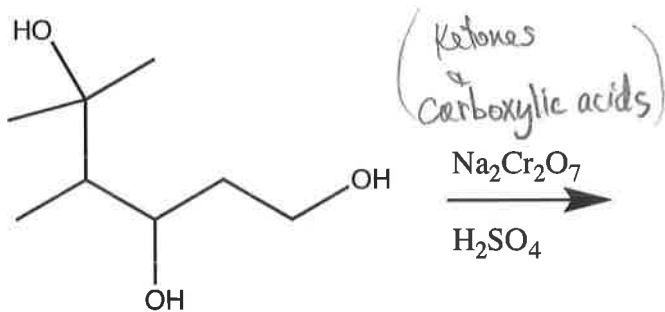
3.) Draw the arrow pushing mechanism for the reaction depicted below. Include all formal charges in every step.



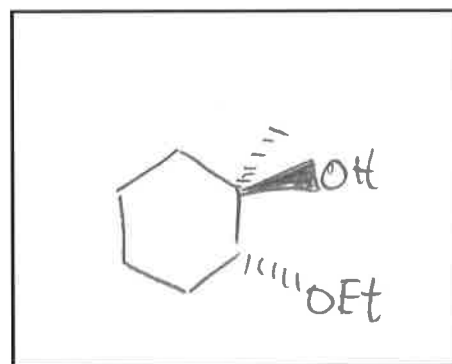
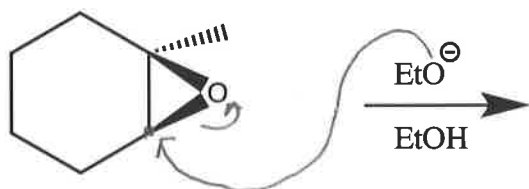
* Even though ring opening shift makes the carbocation go from 3° to 2°, ring strain is decreased and THEN the 3° carbocation is recovered.

4.) The many reactions below are shown missing their **final product** or the **reagents** that complete the reaction itself. For each problem below, either correctly predict the final product or fill in the necessary reagents for the desired transformation.

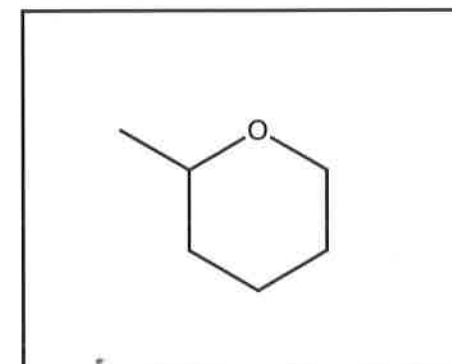
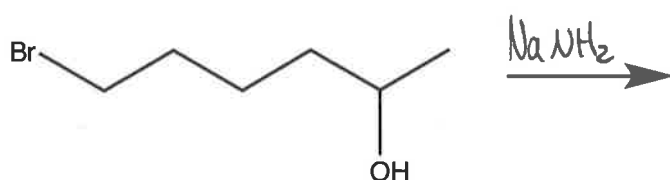
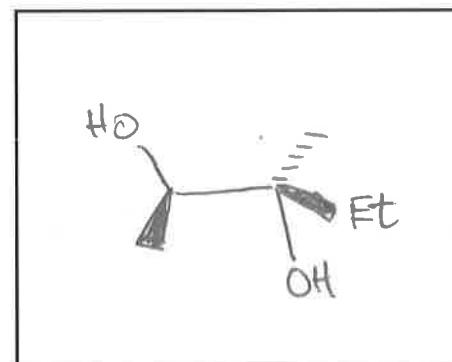
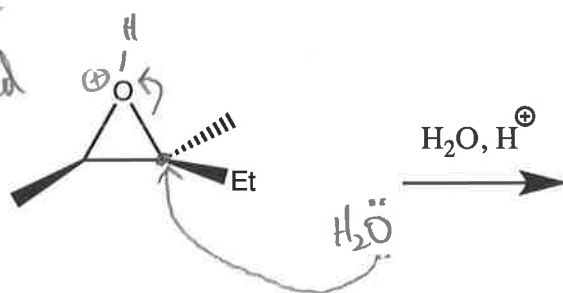
Can't oxidize 3° alcohol



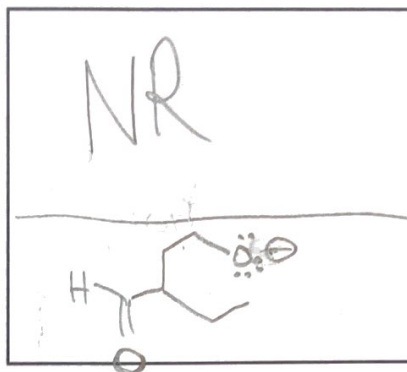
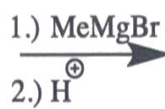
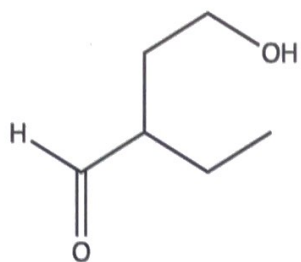
Basic epoxide attack: least hindered carbon



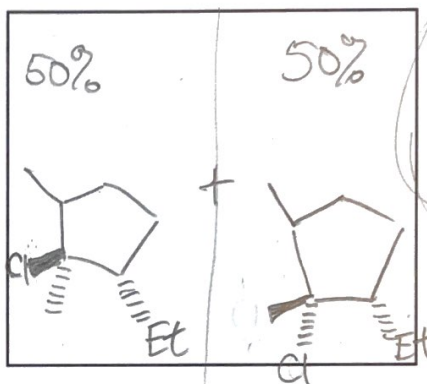
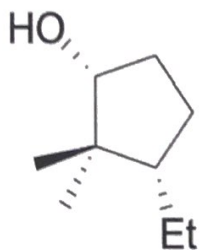
Acidic epoxide attack: more hindered



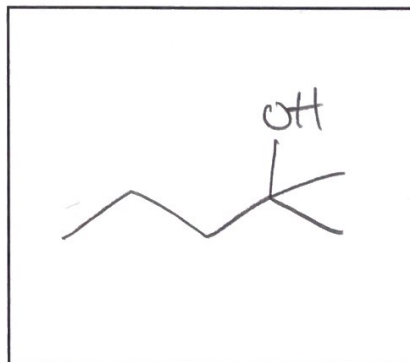
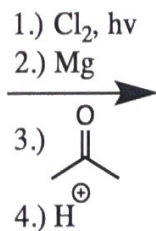
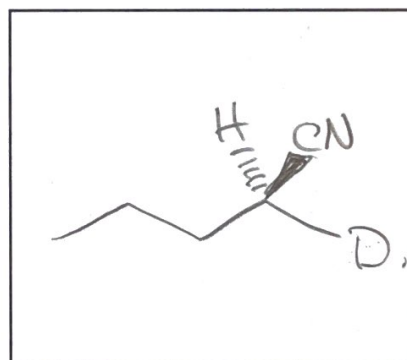
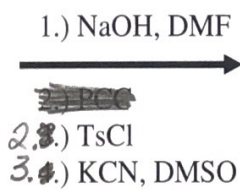
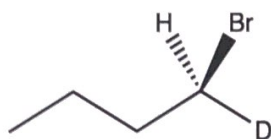
(Need a good base to deprotonate the -OH)



either answer is acceptable



NOT racemic



Big step: Attacking an epoxide in acidic environment

5.) Propose an efficient synthesis of the desired target molecule (pictured below on the right) with benzyl

8 carbons

8 carbons

