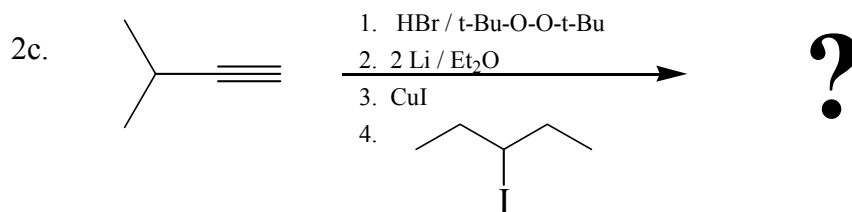
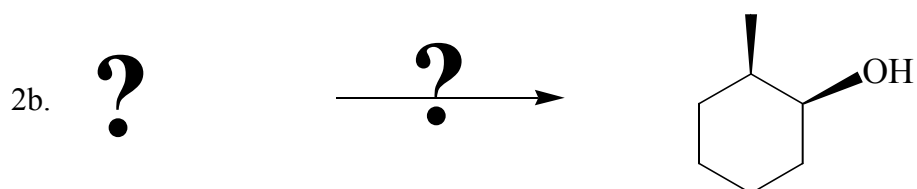
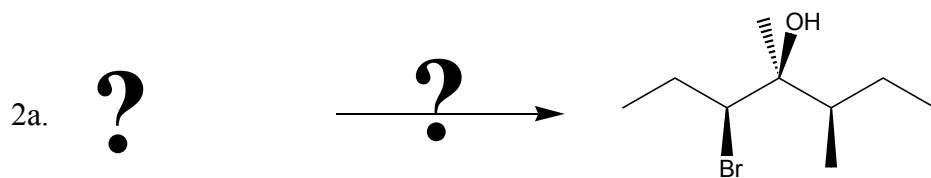
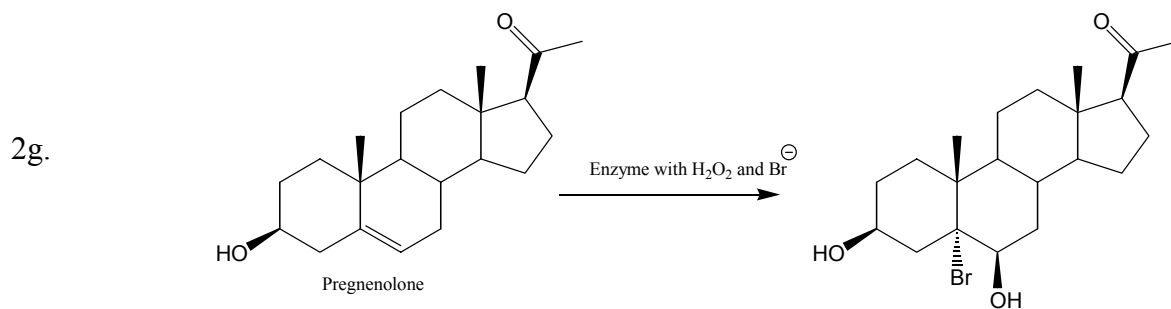
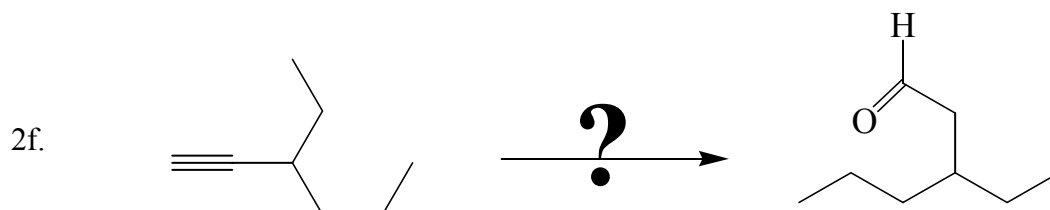
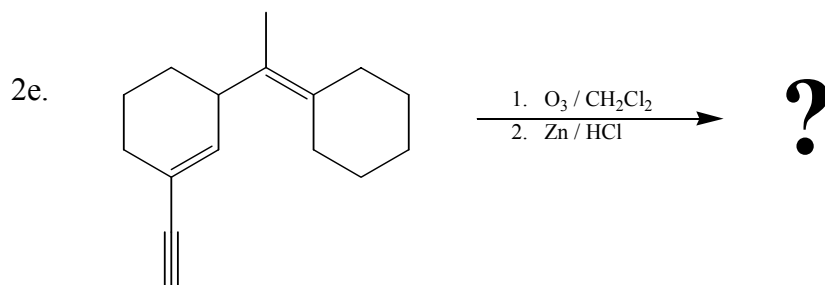
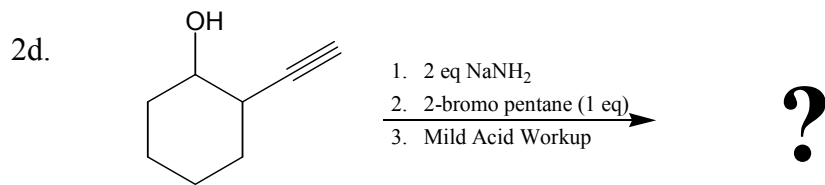


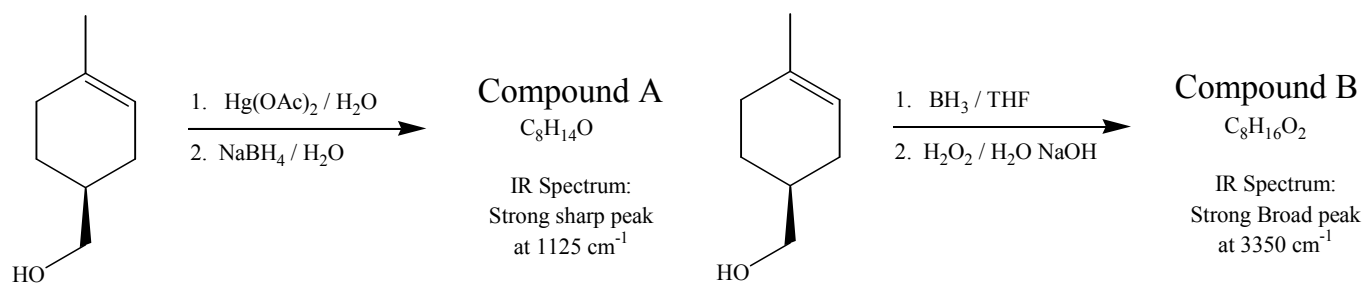
2. Predict products or reagents for the following reactions and briefly describe the effectiveness of the reaction. Mechanisms are NOT required. (7 @ 7 pts = 49 points)





An Enzyme (Biological Catalyst) transforms Pregnenolone (a brain hormone suggested to enhance clear thinking) into this cholesterol precursor using peroxide and bromide ion. If this reaction were to be performed in the organic chemistry laboratory without the enzyme, what reagents would you use to affect this transformation? Explain briefly.

3. Consider the following reactions: (33 points)



3a. What is the structure for Compound A? (4 pts)

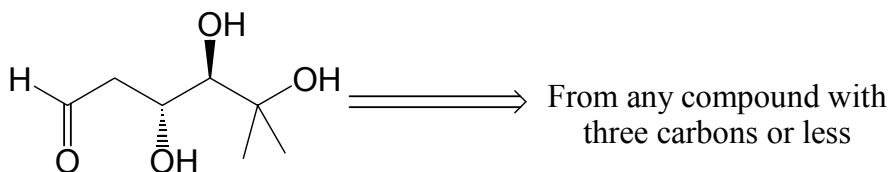
3b. Write a mechanism that accounts for the formation of Compound A? Your mechanism must show the product that results from the first set of reagents (aka $\text{Hg}(\text{OAc})_2 / \text{H}_2\text{O}$) not the second set. Please show the overall conversion of the second set of reagents. Include any important transition states in your mechanism. (8 pts)

3c. What are the structures for Compound B & C? (8 pts)

3d. Write ONE mechanism that accounts for the formation of Compound B **OR** C? Your mechanism must show the product that results from the first set of reagents (aka BH_3 / THF) not the second set. Please show the overall conversion of the second set of reagents. Include any important transition states in your mechanism. (8 pts)

3e. What are the main reasons that help us understand why are there different products from each reaction? (5 pts)

4. Consider the following problem: (26 points)



Make this

4a. Conduct a retrosynthetic analysis for the above problem. Investigate more than one method to make the desired molecule; the various methods do not have to be completely correct, but rather should show that you have thought of alternative routes. (13 points)

4b. Using the best approach from problem 4a, synthesize the desired molecule. Mechanisms are not required, but reagents and conditions are required. (13 points)

5. Provide a mechanism that accounts for the formation of the observed product for the following reaction. (12 points)

