

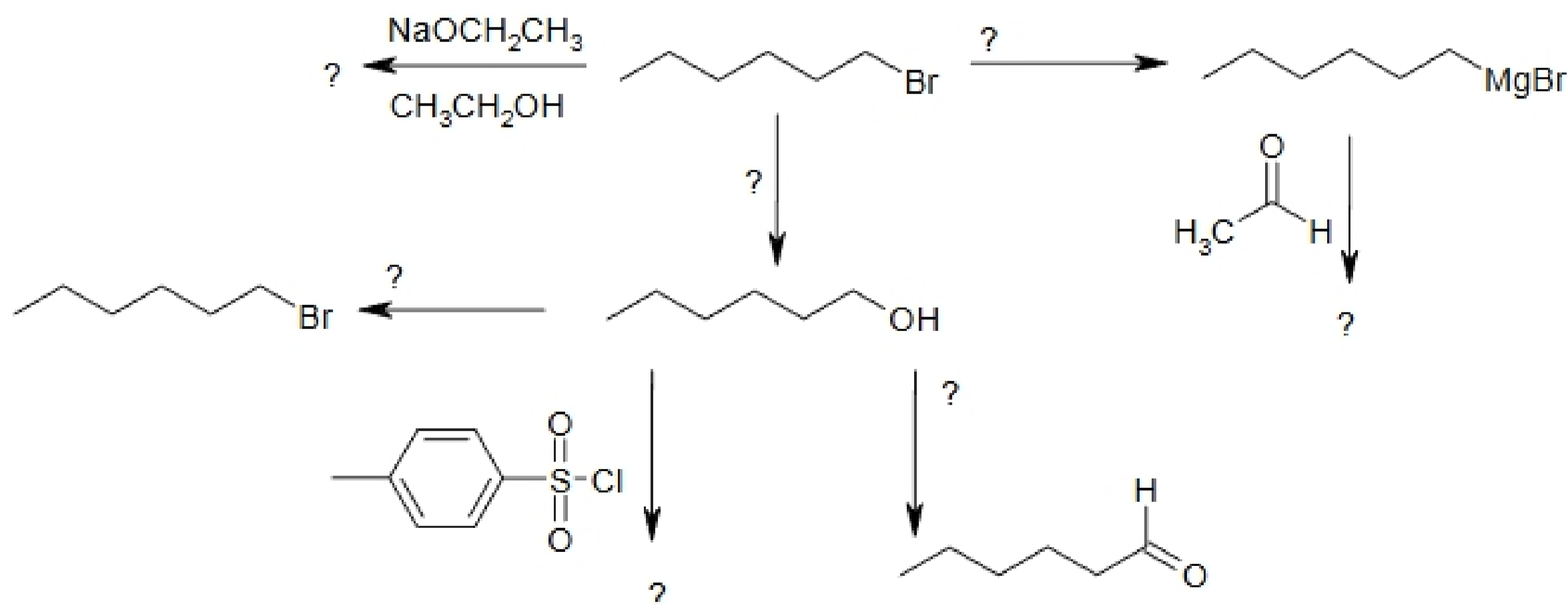
NAME \_\_\_\_\_

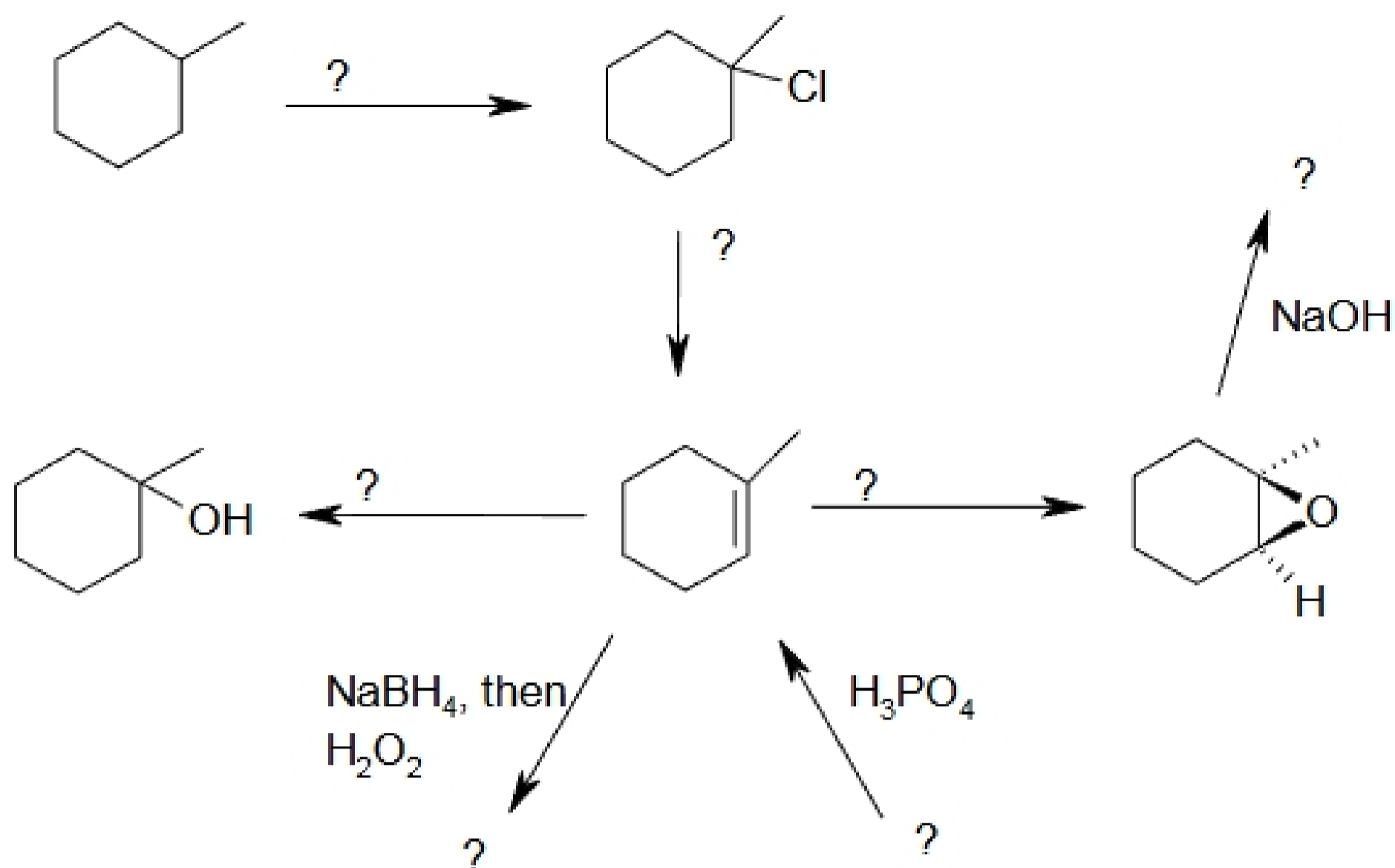
Organic Chemistry I, CHEM 331  
 Sections 003 and 004, Dr. Sweeting  
 FINAL EXAM, December 19, 2001  
 Full credit on this exam is 200 points; in addition, there are 32 BONUS points)

*Please attempt all of the questions. Partial credit will be given for partially correct answers. If you give several answers, only one of which is correct, and do not select that one as your response, you will receive the credit earned by the wrong answer. Note that reactions that give two or more products are exempted from this caveat. If you need more space to answer a question, you may write on the back of the page, but you must indicate where your answer is.*

***Tear off the last 3 pages of the exam and take them with you.***

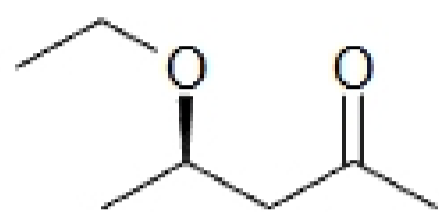
1. Please complete each of the following reactions by adding a missing reagent or product as indicated by the "?". Indicate the product formed in *highest concentration* if more than one is formed (the word "most" will do). For organic compounds, please give the structure, using either stick / polygon or complete line-bond structural formula; for inorganic reagents, condensed formulas are acceptable, as are very common abbreviations for complex reagents (I have used a few abbreviations myself and will be glad to give you the full formula if you need it - free). Show *stereochemistry* in every case where a preference is observed. You do not need to show the neutralization step for reactions done in acid or base. (4 points each, 56 total)



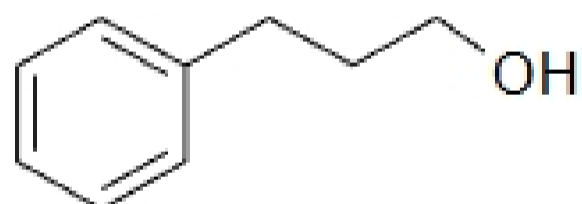
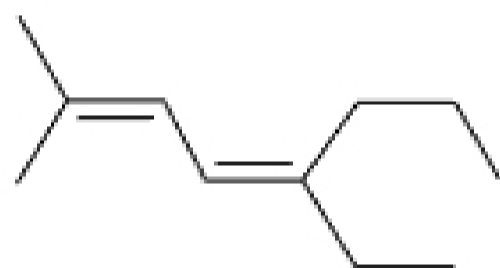
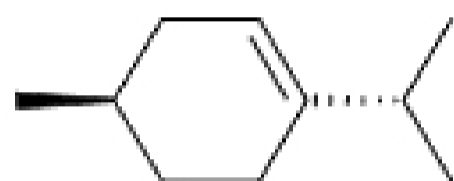


2. a) Please make a graph of the change of energy as a function of angle of rotation (dihedral angle) about the C2-C3 bond for butane. Energy values are not necessary. Label the graph with sketches of the conformations at each energy maximum and minimum and with the angle through which the groups were rotated (you may choose any starting conformation). (18 points)
- b) BONUS: Show the actual values for the energies for the conformations (6 points) on the graph below.

3. Please provide an IUPAC name for each of the following, including the correct name for the *stereochemistry* where appropriate. Note: even if the name is incorrect, points will be given for correct stereochemistry if the site and name are clearly labelled. (equal credit for each correct answer, 40 points total)



1-menthene



the sugar

