

**S2018 Organic Chemistry I
Final Exam 1**

Name (print):

Name (Sign) :

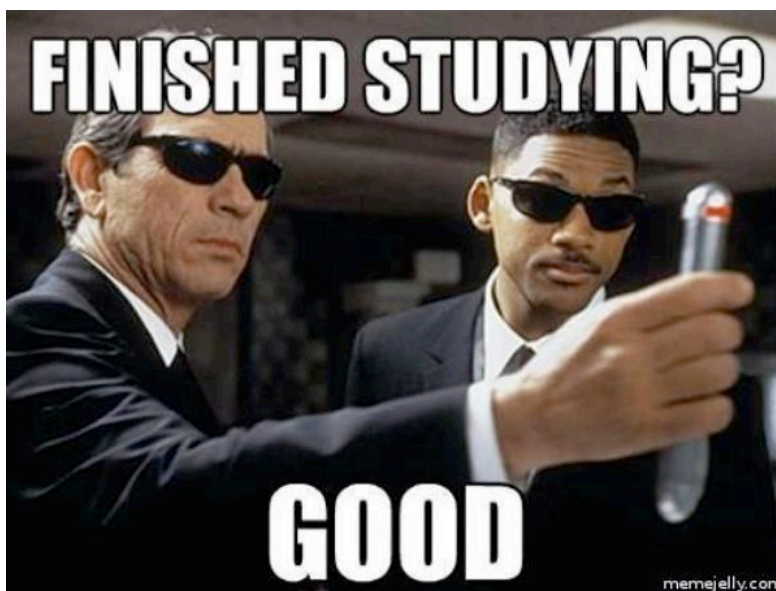
Instructions

1. Keep the exam closed until you are instructed to begin.
2. The exam consists of 10 questions. The first thing you should do is make sure that no pages are missing. If a page is missing, notify a proctor immediately.
3. You will have 1 hr and 50 minutes to complete the exam, at which time pencils must be put down. Budget your time wisely.
4. Make sure to show all of your work, and make it clear what your thought process was. Answers should fit in the space provided. If you need to use the back of the sheet of paper, you must make note of it in the space allotted for credit.

Breakdown

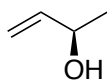
1. ___ / 4 (IUPAC)
2. ___ / 6 (Hybridization)
3. ___ / 8 (Stereochemistry)
4. ___ / 8 (Chairs)
5. ___ / 8 (Newmans)
6. ___ / 16 (Reactions)
7. ___ / 20 (Mechanisms)
8. ___ / 12 (Synthesis)
9. ___ / 10 (NMR)
10. ___ / 8 (Concept)

total ___ / 100

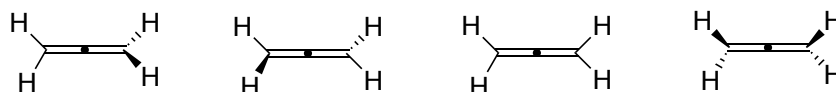


<http://thehive.com/2014/12/10/finals-are-here-and-so-are-the-memes-27-photos/>

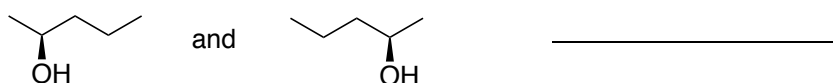
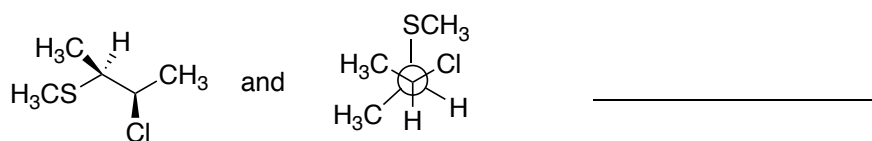
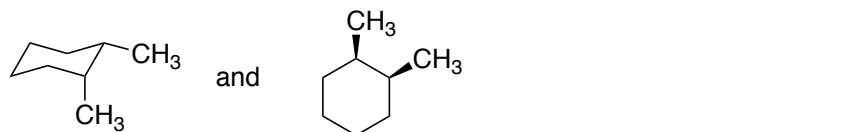
1. Provide the IUPAC Name for the Following Molecule. Make sure to address stereochemistry. (4 points)



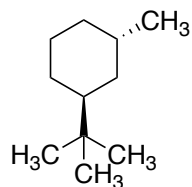
2. Circle the correct structure of allene. Draw in the p orbitals to help explain your answer. (6 points)



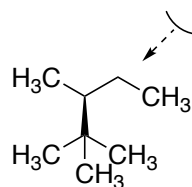
3. Chose two of the following 3 pairs of molecules and indicate whether they are enantiomers, diastereomers, or identical. If you answer all 3, we will grade the top 2. (8 points)



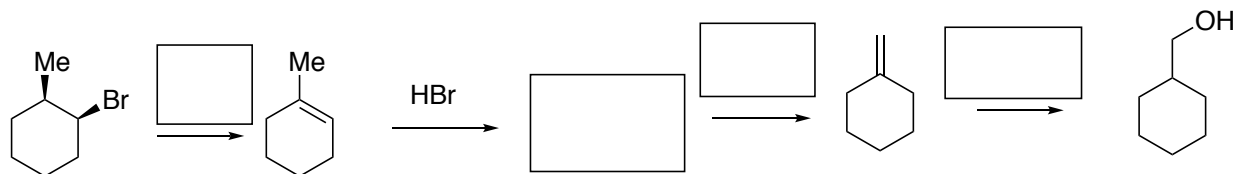
4. Draw both chair conformations of the following molecule, and then circle the one that you believe is lower in energy. (8 points)



5. Draw all 3 staggered Newman conformations using the perspective shown. Circle the one(s) that is(are) lowest in energy (8 points)

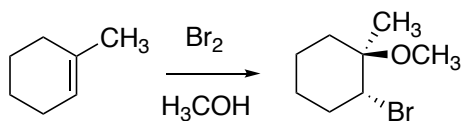


6. Provide the missing reactants/reagents in the following synthetic scheme (16 points)

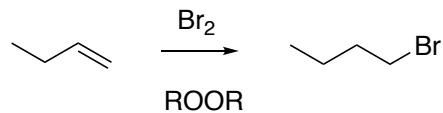


7. Show the mechanism for 4 of the following 5 reactions. If you try more than 4, make sure to place an X over the reaction that you do not want graded. If you do not do so, we will grade the first 4.

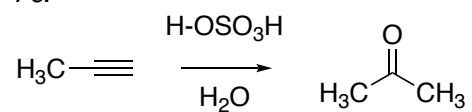
7a.



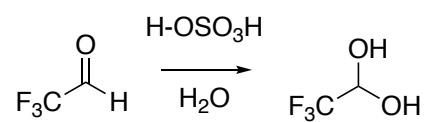
7b.



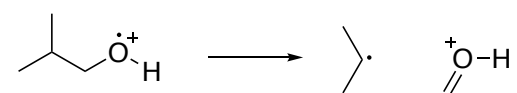
7c.



7d. (Organic II reaction you should be able to figure out)

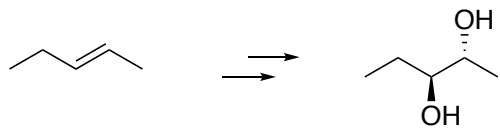


7e. (Mass Spec Fragmentation)

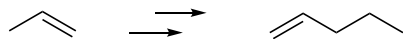


8. Propose syntheses that would be necessary to carry out the following transformations. Make sure to show intermediates for full credit. Chose 2 out of the 3, and if you try all 3, put an X across the one you don't want graded. Otherwise, we will grade the first 2. (12 points, 6 points each)

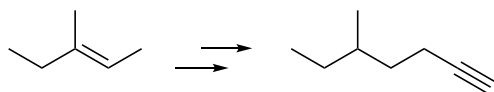
8a.



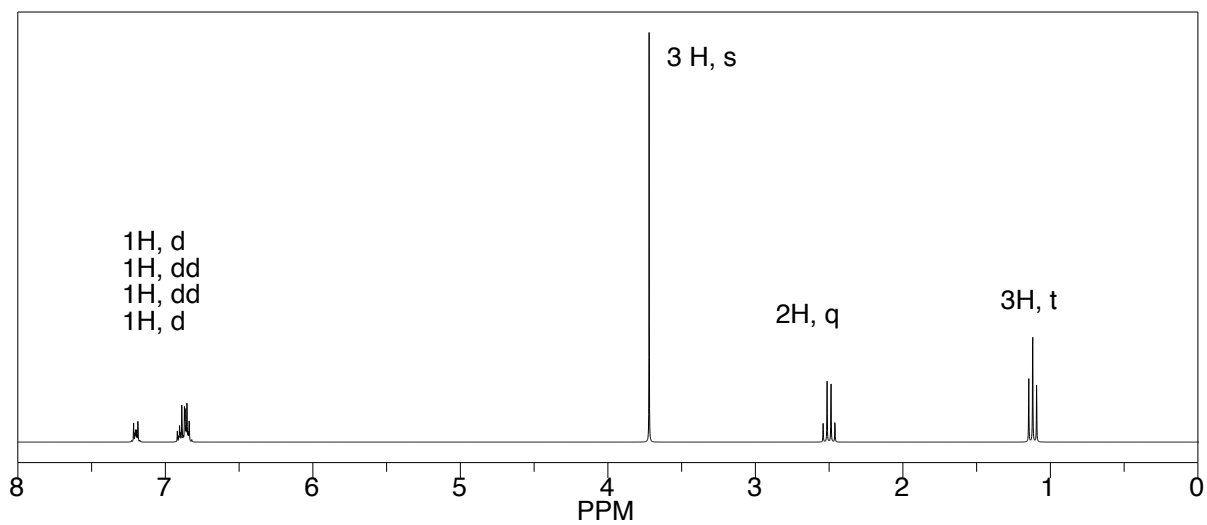
8b.



8c.

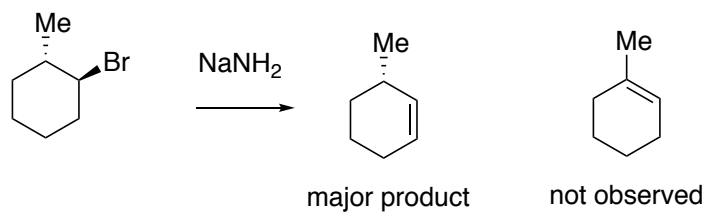


9. Show a structure consistent with the following NMR that has the molecular formula $C_9H_{12}O$. (10 points)



10. Zaitsev's rule says that elimination with small, strong bases should provide the more substituted alkene. Why don't these? (8 points, 4 points each)

10a. Here's one you've seen (4 points)



10b. This is from Organic II, but can be reasoned based upon Organic I knowledge (4 points)

