First Exam
CHEM 256 – Organic Chemistry II
Prof. Bastin
Spring 2015

Name _____ Section _____

1. DO NOT START this exam until you are instructed to begin.
2. There are EIGHT pages including this cover sheet - make sure they are all here!
3. Provide *CLEAR, CONCISE* answers using unambiquous, carefully drawn structures and mechanisms for the appropriate questions. *Be sure to read each question VERY CAREFULLY*.
4. Do not provide mechanisms for synthesis and product prediction problems.
5. You may only use a pen or pencil and the materials provided in this packet on this exam.
6. If you have papers and/or books with you, they are to be left on the floor **AT THE FRONT OF THE ROOM**. If you need scrap paper please ask.
7. Cell phones must be **OFF and placed on the table at the FRONT of the ROOM**.

1) _____/15 pts

2) _____/15 pts

3) _____/20 pts

4) _____/15 pts **Total: _____/100 pts**

5) _____/10 pts

6) _____/12 pts

7) _____/13 pts

1) (15 pts) Provide structures for the following compounds.

a) 3-chloro-1-hexyne

b) (Z)-1-chloropropene

c) 3-cyclopropyl-1-butene

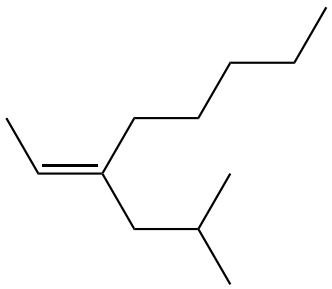
d) (*E*)-2,6-dimethyl-2,6-octadiene

e) *cis*-2-pentene

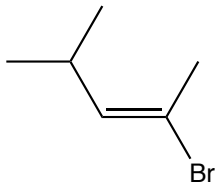
f) 5-methyl-3-octyne

2) (15 pts) Provide either common or IUPAC names for the following compounds?

a)



b)



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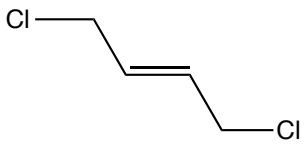
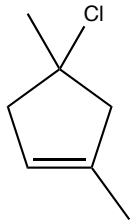


d)



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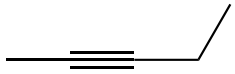

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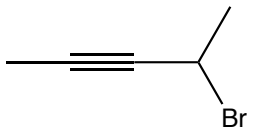
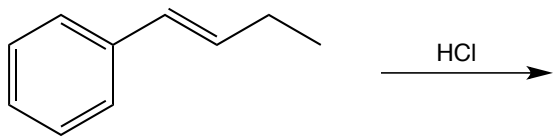
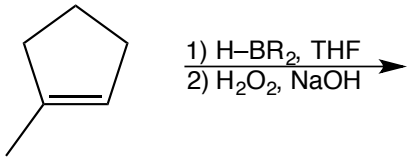


3) (20 pts) Draw the product(s), if any, of the following reactions. Indicate stereochemistry where relevant.

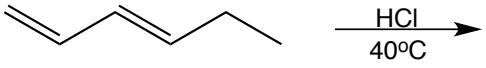
a)



b)



c)



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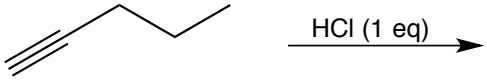

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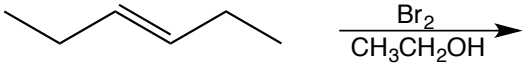

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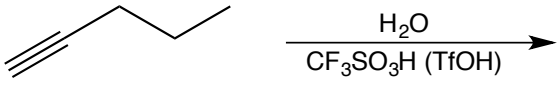
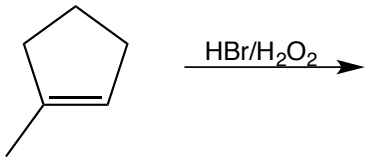
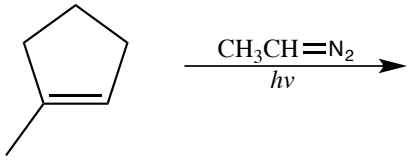


g)



h)



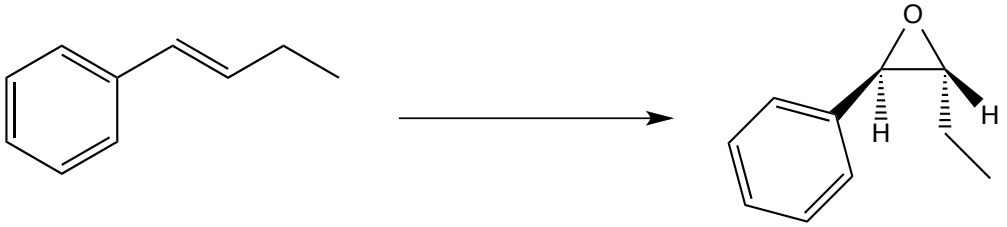
4) (15 pts) Provide the reagents needed to bring about the following transformations.

a)

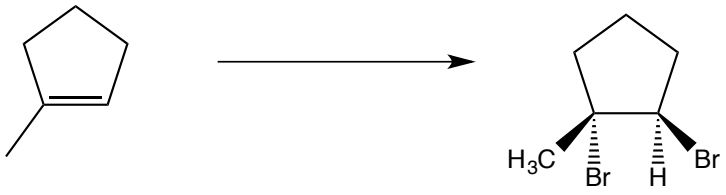
b)

c)

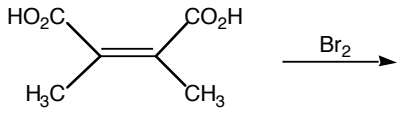
d)



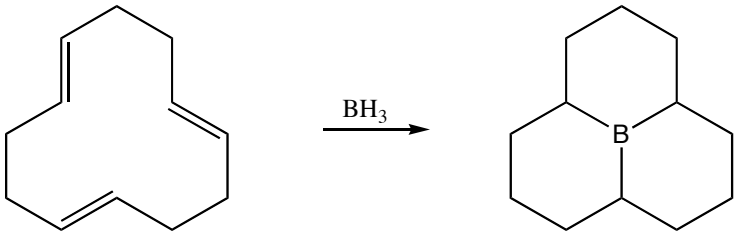
e)



5) (10 pts) Predict the MAJOR product and draw the curved-arrow mechanism for the following reaction. Be sure to indicate any stereochemistry, if appropriate.



6) (12 pts) The following reaction is quite similar to a reaction that we have previously discussed, but it is not exactly the same. Since our aim in this class is to develop the ability to understand new observations in the light of old knowledge, propose a curved-arrow mechanism for the reaction.



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7) (13 pts) When cyclohexene is treated with a peroxyacid in water, *trans*-cylcohexane-1,2-diol is produced. Provide a mechanism for this reaction, accounting for the observed stereochemistry.