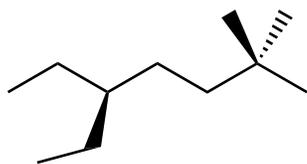
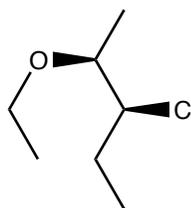


1. (8 pts. ea.) Provide IUPAC names for the following alkanes/substituted alkanes.

a.



b.



1. _____

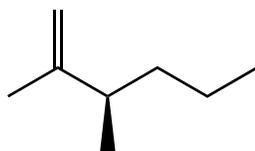
2. _____

3. _____

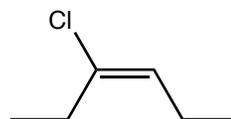
4. _____

2. (8 pts. ea.) Provide IUPAC names for the following alkenes/substituted alkenes.
 Remember to use the *Z/E* nomenclature where appropriate.

a.



b.



5. _____

6. _____

7. _____

8. _____

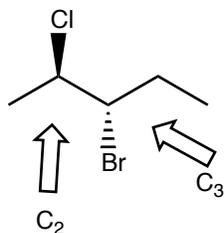
9. _____

3. (8 pts.) Convert 1.b. and 2.a. into condensed structures by adding C's, CH's, CH₂'s, and CH₃'s to the drawings above.

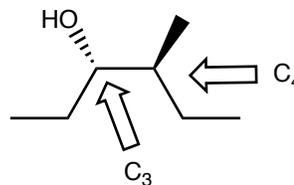
10. _____

4. (6 pts. ea.) Draw Newman projections along the indicated bonds for the rotamers drawn below.

a. From C₂ to C₃



b. From C₃ to C₄



5. (10 pts.) Most acyclic alkanes can rotate freely around their C–C bonds. However, some rotamers have higher energy (more bond strain) than others. Explain why rotamers with eclipsing geometries are higher in energy than those with staggered geometries.

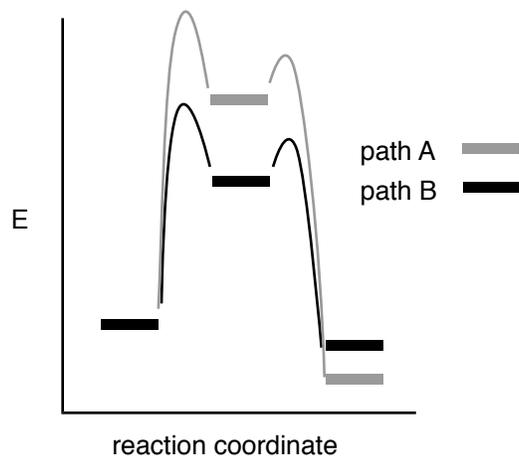
6. (2 pts. ea.) Determine whether the following molecules/ions/atoms are nucleophilic, electrophilic or neither.

Br ₂	CH ₂ CHCH ₂ CH ₃	CH ₃ CH ₂ CH ₂ CH ₃
Cl ⁻	CH ₃ OH	HSO ₄ ⁻

7. Path A and path B represent two possible electrophilic addition reactions that could theoretically occur on a given alkene.

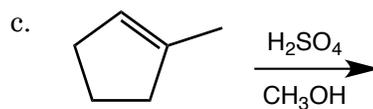
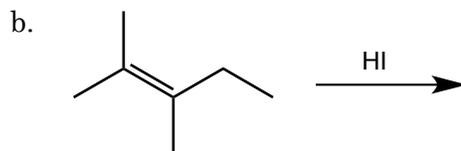
- a. (4 pts.) Assuming that the reaction occurs under conditions that allow the reaction to reach equilibrium, which path would have the more favorable equilibrium constant.

- b. (4 pts.) Describe how it could be possible for the major product to be produced by path B.

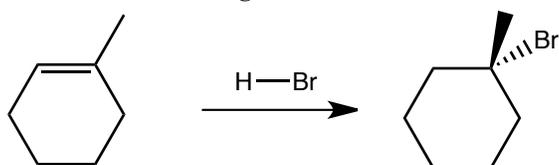


- c. (4 pts.) One path involves the production of a 3° carbocation and the other involves the production of a 2° carbocation. Label the portions of the diagram that represent the 3° and 2° carbocations.

8. (6 pts. each) Predict the organic product(s) of the following reactions.



9. (10 pts.) Draw a mechanism for the following reaction.



10. (6 pts.) What is wrong with the following skeletal structure? Explain your response.

