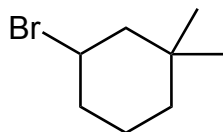


## Problem Set Chapter 4

Name \_\_\_\_\_

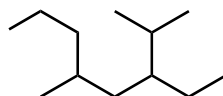
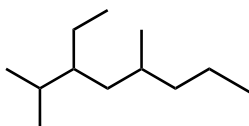
**DUE: Wednesday September 20 @ 8 am**

1. Answer the following questions based on the structure of the molecule below:

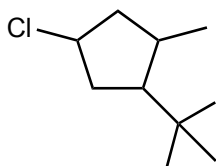


- Number of primary hydrogens present?
- Number of secondary carbons present?
- Number of tertiary hydrogens present?

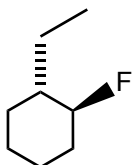
2. Systematically name the two compounds below and determine their relationship:



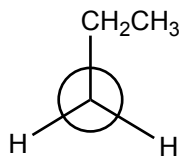
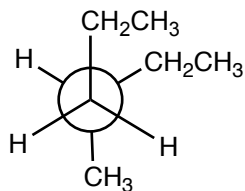
3. Provide the IUPAC name for the compound below as completely as possible:



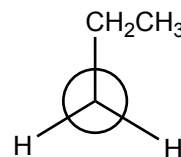
4. Provide the IUPAC name for the compound below as completely as possible:



5. Predict the LEAST and MOST stable conformation (draw a Newman projection) for the compound given below using the templates provided:



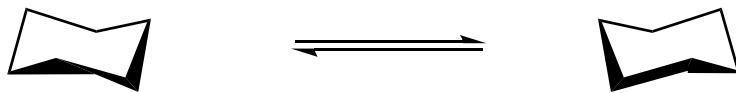
**LEAST STABLE**



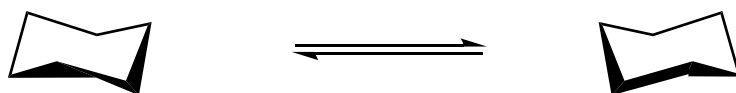
**MOST STABLE**

6. Provide the IUPAC name for the compound in question 5.

7. Draw the two chair forms for *cis*-1-*tert*-butyl-4-ethylcyclohexane. Which is most stable? Briefly explain.



8. Draw the two chair forms for *trans*-1-chloro-3-fluorocyclohexane. Which is most stable? Briefly explain.



9. Name the following compound as completely as possible according to IUPAC rules:



10. After 3 seconds of hard thought (i.e. 3 more seconds than usual), Jimmy says *cis*-1,3-dimethylcyclohexane is less stable than *trans*-1,3-dimethylcyclohexane since the two methyl groups in the *cis* isomer, being on the same side of the ring, are closer together than they are in the *trans* isomer. According to Jimmy, if the two methyl groups are closer together, the steric energy will be greater, making the *cis* isomer less stable. Is Jimmy correct? why or why not? (HINT: consider the MOST STABLE chair forms of the two compounds).



**Jimmy**

