**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Homework Set #3**

 1. What is the IUPAC name of the compound shown in the following Newman projection?



2. At room temperature, the various conformations of butane

A. do not interconvert; only the anti form is present.

B. do not interconvert, but all conformations are present.

C. interconvert very slowly.

D. interconvert very rapidly.

3. Identify the spatial relationship of the two chlorine atoms.



A. gauche

B. anti

C. eclipsed

D. twist

4. What is the IUPAC name of the following compound? Be sure to include cis or trans in your answer if necessary.



5. Identify the relationship between the following two structures.



A. constitutional isomers

B. stereoisomers

C. different conformations of the same compound

D. identical

6. Identify the two atoms *anti* to the bromine.



A. the equatorial H's on C-2 and C-6

B. the axial H's on C-2 and C-6

C. C-2 and C-6

D. C-3 and C-5

7. The most stable chair conformation of *cis*-1-*tert*-butyl-3-methylcyclohexane has

A. both groups equatorial.

B. both groups axial.

C. the *tert*-butyl group equatorial and the methyl group axial.

D. the *tert*-butyl group axial and the methyl group equatorial.

8. Which isomer of 1-*tert*-butyl-3-ethyl-5-methylcyclohexane below is thermodynamically the most stable?









9. Which constitutional isomer of dimethylcyclohexane does not exhibit *cis-trans* isomerism?

 A. 1,1-dimethylcyclohexane

 B. 1,2-dimethylcyclohexane

 C. 1,3-dimethylcyclohexane

 D. 1,4-dimethylcyclohexane

10. What is the correct IUPAC name of the following compound?



 A. *cis*-1-ethyl-2-methylcyclohexane

 B. *trans*-1-ethyl-2-methylcyclohexane

 C. *cis*-1-ethyl-6-methylcyclohexane

 D. *trans*-1-ethyl-6-methylcyclohexane

11. Draw the two chair conformations of each compound, and label the substituents as axial or equatorial In each case, determine which conformation is more stable.

 A. *cis*-1-ethyl-2-isopropylcyclohexane

 B. *cis*-1-ethyl-3-methylcyclohexane

 C. *cis*-1-ethyl-4-methylcyclohexane

 D. *trans*-1-ethyl-2-isopropylcyclohexane

 E. *trans*-1-ethyl-3-methylcyclohexane