1. Draw all conformations of the following. Draw a potential energy diagram for each, illustrating their relative stability. Label eclipsed and staggered conformations. Label syn, anti, and gauche conformations, when appropriate.

(a) 2-methylbutane, sited along the C2-C3 axis.

(b) 2,3-dimethylbutane, sited along the C2-C3 axis.

(c) 1,2-dibromoethane(BrCH₂CH₂Br)

2. Perform the following for cyclopropane, cyclobutane, cyclopentane, and cyclohexane. Draw and name all conformation. Write the bond angles for each. Explain the types of strain each experiences: angle strain, tortional strain and steric strain.

3. Draw the following in chair conformations; then, draw the structure obtained by inversion. Decide which, if either, is more favorable in an equilibrium.

(a) cis-1,2-dimethylcyclohexane

(b) trans-1,2-dimethylcyclohexane

(c) cis-1,3-dimethylcyclohexane

(d) trans-1,3-dimethylcyclohexane

(e) cis-1-t-butyl-4-methylcyclohexane

(f) trans-1-t-butyl-4-methylcyclohexane

4. Which do you expect to be the more stable conformation for cis-1,3-dimethylcyclobutane?
5. Identify the more stable isomer in each of the following pairs. Justify your choice.