**Exercise # 6: Basic Language and Representations of Ring Conformers**

**Organic Chem I Alfred State College**

(see also: Supplement #5: ***Vocabulary Of Rotational & Ring Conformers and text pp. 96-109)***

**6.1. Ring Conformation Types and Representations**







 **I II III**

1. Which structure above is the least stable ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which structure above is called half-chair ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which structure above is the most stable ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Which structure above is called boat ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Which structure above is called chair ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Which structure above is represented by the commonly used picture below: (see also text p. 59)



 Same as: \_\_\_\_\_\_\_\_\_\_\_\_\_

**6.2. Interpreting and Predicting Stabilities of Substituted Cyclohexanes in the Chair Conformation**

 **The Basic Facts**

 i)On any given carbon, one bond position is axial and trans to an equatorial bond

 ii) axial placement is less stable than equatorial

 iii) axial/equatorial switches back and forth serially around each carbon on the ring

 iv)axial/equatorial on a given carbon on the ring can be switched by `ring flipping’ the chair (text pg 102)



 Original chair ring flipped chair

 (OH are ax,ax) (OH are eq, eq)



2

1

 A B C D



a)Which 1,2-dimethyl structure can’t exist above: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b)Which is the most stable, possible 1,2-dimethyl structure above ? \_\_\_\_\_\_\_\_\_\_

c) Which is more stable: C or D ?

d) Which structure above is the parent of the ring-flipped compound shown here:

e) Provide the most complete name for B\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

f)Draw the most stable trimethyl-substituted hexane made from B if the third methyl is substituted onto C-6.