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



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

**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: \_\_\_\_\_A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

c) Which is more stable: C or  **D ?**

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

e) Provide the most complete name for B\_\_***cis (eq,ax) 1,2-dimethylcyclohexane***\_\_\_\_

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

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

**Equatorial placement preferred**

