

Seat No. _____

LAST NAME _____

Section _____A_____

FIRST NAME _____

There are 7 pages to this exam. Check to make sure you have a complete exam.

PLEASE ALSO PRINT YOUR NAME ON THE TOP OF
THE BACK OF THE LAST PAGE OF THE EXAM

CHEMISTRY 331

EXAM I

Fall 2006 (9/12/06)

I. (22 points) _____

II. (16 points) _____

III. (8 points) _____

IV. (12 points) _____

V. (6 points) _____

VI. (10 points) _____

VII. (14 points) _____

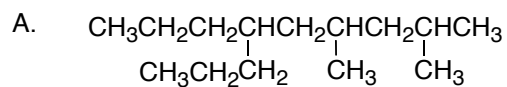
VIII. (12 points) _____

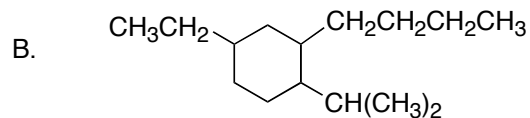
TOTAL (100 points) _____

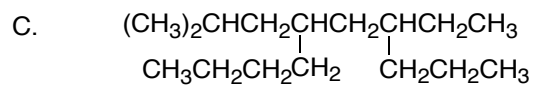
Seniors graduating Fall 06 please check box

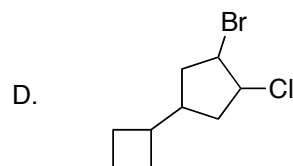
Seniors will not be excused from final.

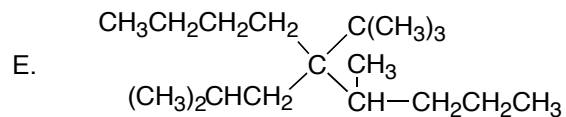
I. (22 points). Give IUPAC names for the following compounds.





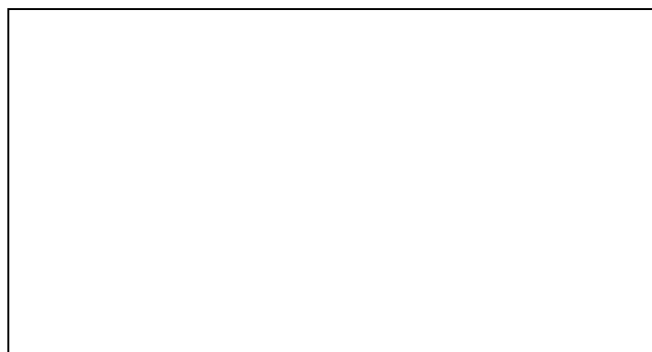




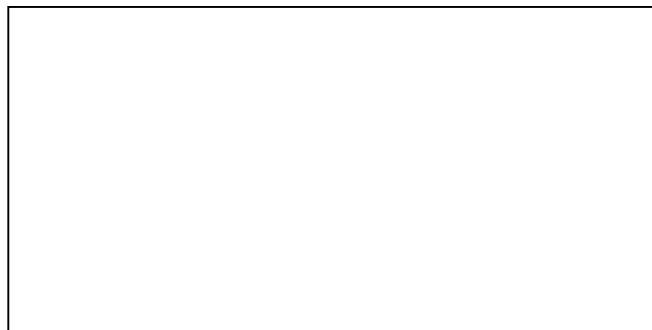


Draw the structures for the following names (show all hydrogens).

F. isobutylcycloheptane

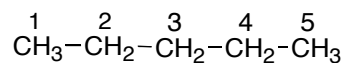


G. (4 pts) *trans*-1,2-di-*sec*-butylcyclopropane



VI. (10 points)

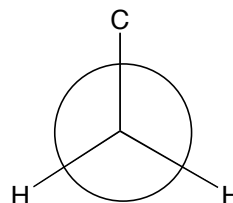
A. (6 points) Consider rotation about the C₂-C₃ bond of pentane **A**.



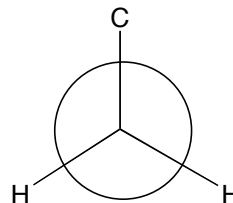
A

Complete the Newman projections to show conformations which fit the following descriptions.

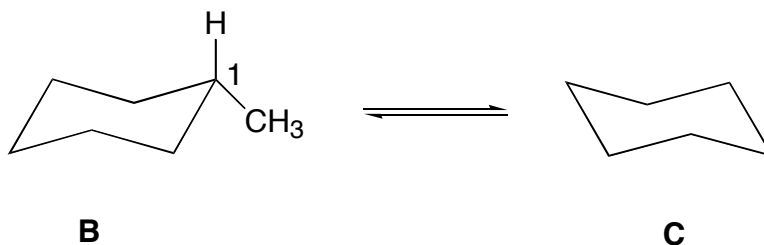
1. The gauche conformation



2. The less stable eclipsed conformation

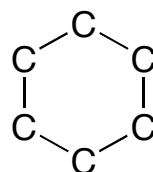
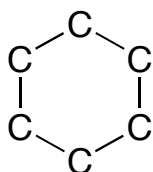
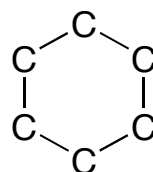
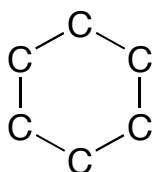
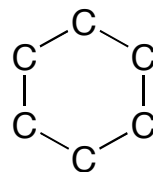
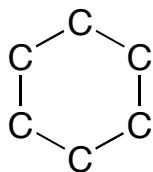


B. (4 points) One of the conformations of methylcyclohexane is structure **B**. Only the methyl group and the hydrogen atom attached to carbon 1 are shown. Conformation **B** undergoes a ring flip to form conformation **C**. On the cyclohexane structure below, complete **C** by drawing in the methyl group and the hydrogen atom attached to carbon 1.



VII. (14 points)

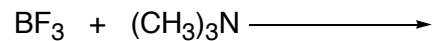
A. Complete the structures below to show ALL constitutional isomers (note: constitutional isomers only, no stereoisomers) of the substituted **cyclohexanes** that have the formula C_8H_{16} . **Be sure to show all hydrogens.** There are no more than 6 constitutional isomers and there may be fewer. **Cross out any boxes that are not used.** Points will be deducted for duplicate or incorrect structures.



B. Circle all constitutional isomers that can exist as a pair of cis-trans isomers.

VIII. (12 points)

A. Draw the structure of the product(s) of the following reaction (show formal charges if appropriate).



B. Draw the structure of the conjugate acid of a ketone that has 4 carbon atoms.

C. Draw a pair of stereoisomers that are cyclopentanes and have the molecular formula C_7H_{14} .

D. Draw the structure of a 5-carbon atom molecule that has only primary hydrogen atoms.