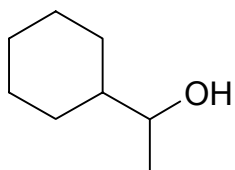
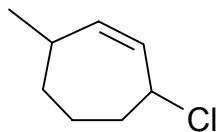
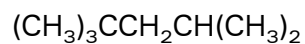
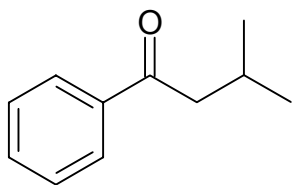
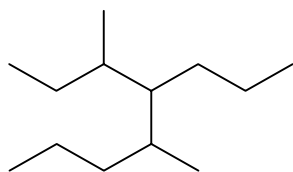


NAME _____

Organic Chemistry I, CHEM 331
Exam 1, October 5, 2001
Sections 003 and 004, Dr. Sweeting
Full credit 100 points, 111 possible.

Points and space are given for each problem. If you need more space, please use the back of a page and *inform me of the location of your answer* to receive credit.

1. Please provide IUPAC names for each of the following organic structures. If you wish to redraw the structure before naming it, please do so. (5 points each, 25 total)

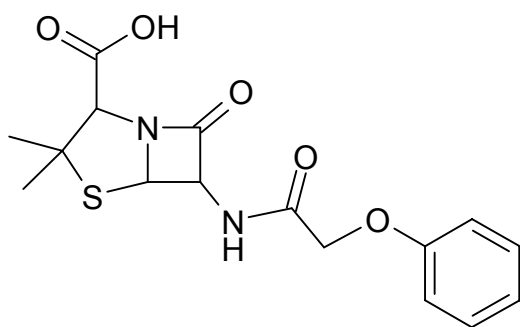


2. Please sketch the structure that corresponds to the following IUPAC names. (5 points each, 10 total)

trans-1-isopropyl-3-methylcyclopentane

cyclohexylcyclohexane

3. Please circle and identify by name three different functional groups in the sketch of penicillin V below. Use the general definition of functional group, i.e. anything more reactive than alkane. (6 points)



4. Sketch at least four isomers *each* for the following formulas (extra credit for extra structures which are both correct and different): (2 points for the first, one for each additional, more than 10 total)

a) C_5H_{10}

b) C_3H_7N

5. Sketch each of the following compounds in its most stable conformation using any style of drawing that shows the conformation clearly. (5 points each, 20 total)

a) 2-methylbutane

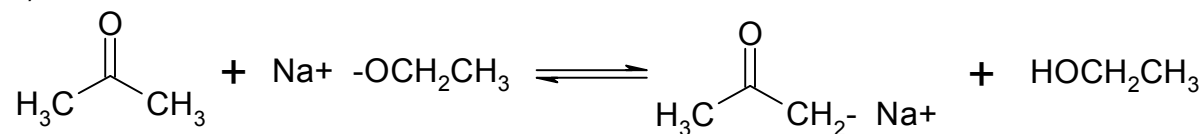
b) *cis*-1,2-dimethylcyclohexane

c) *cis*-1,3-dimethylcyclohexane

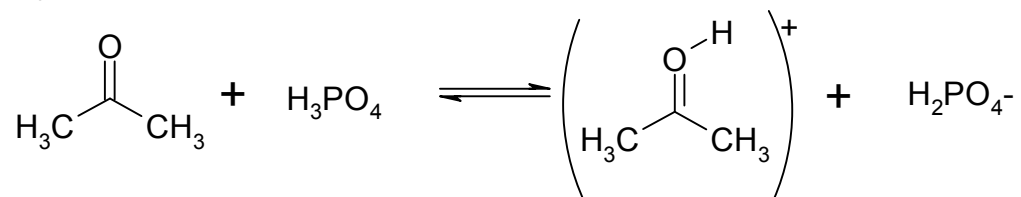
d) cyclobutane

6. Consider the following acid-base equilibria:

a)



b)



- i) Below the equations a) and b), please label the conjugate acids and bases (8 points)
- ii) Below the equations a) and b), please label the strongest acid and the strongest base in each reaction assuming that the equilibrium lies to the right (i.e. the product of the concentrations on the right of the equilibrium arrow is greater than the product of the concentrations on its left). (8 points)
- iii) In b) calculate the formal charge on the oxygen of the ketone component on both sides of the equation. Label the oxygens with the results of your calculations. (8 points)
- iv) The products derived from the ketones in equilibria a) and b) are both resonance stabilized. Please sketch another contributor for each in the right hand margin, near the one that is shown. (8 points)

