NAME (Print): _____

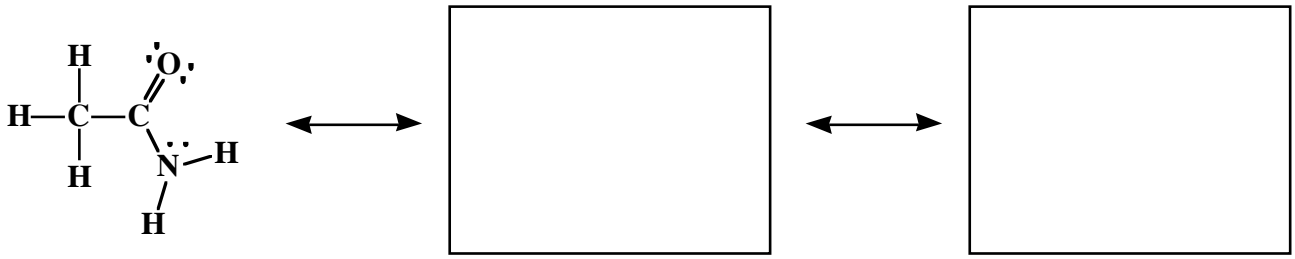
SIGNATURE: _____

Chemistry 310N
Dr. Brent Iverson
6th Homework
February 27, 2008

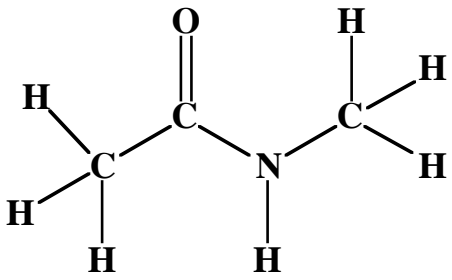
Please print the first three letters of your last name in the three boxes

Score: _____

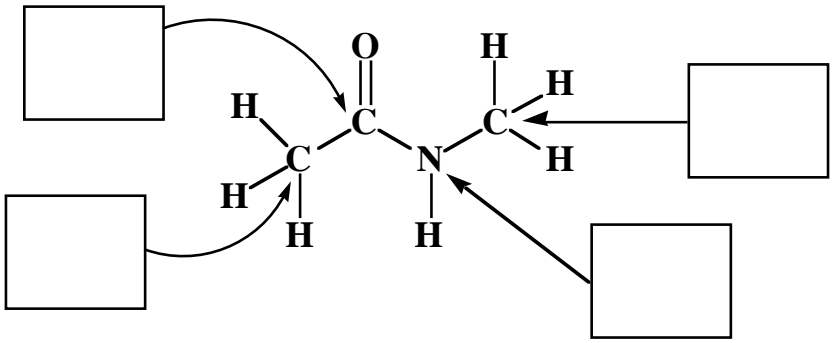
1. (10 pts) On the left is drawn the Lewis structure of a simple amide. Draw the two next most important contributing structures in the spaces provided. Be sure to show all lone pairs and formal charges.



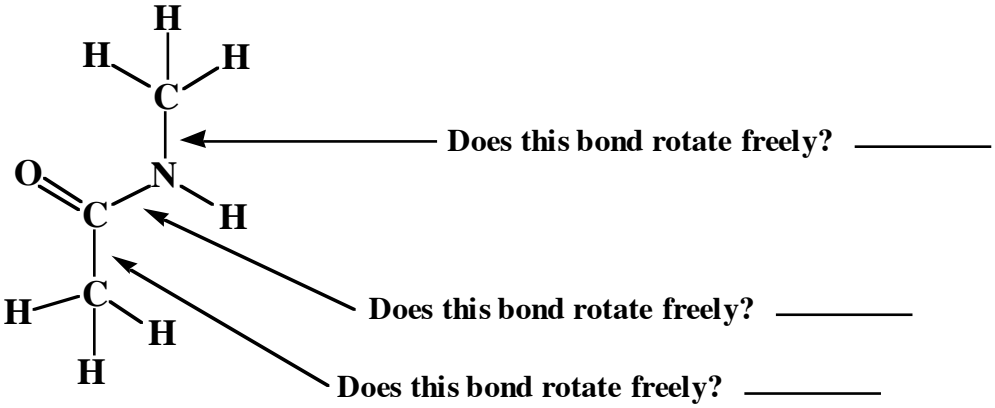
2. (6 pts) Because of the resonance you described with the above structures, several atoms of an amide bond are in the same plane. On the amide below, circle all the atoms that are in the same plane. Think carefully about this one!!



3. (4 pts) In the boxes provided, write the hybridization state of the given atoms.

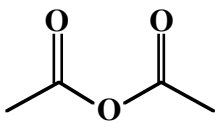


4. (6 pts) In the spaces given, answer the question as "yes" or "no".



5. (8 pts) Carboxylic acids exist in solution as characteristic "dimers". Draw the structure of the dimer formed by butanoic acid, $CH_3CH_2CH_2CO_2H$.

6. (4 pts.) Rank the following in terms of reaction with a strong nucleophile such as HO-, with a **1 under the molecule that is least reactive**, and a **4 under the molecule that is most reactive**.



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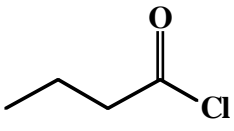

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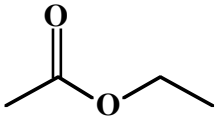

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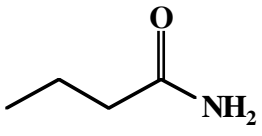

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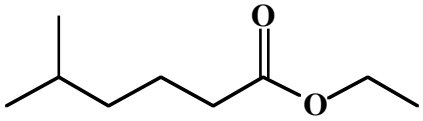
7. (6 pts) List two attributes of amide bonds that lead to stabilization of the folded structures of proteins.

8. (3 pts each) In the space provided give the IUPAC name for the given molecule.



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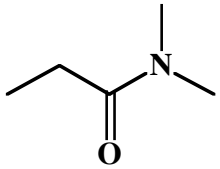

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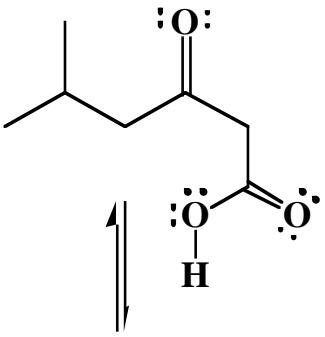
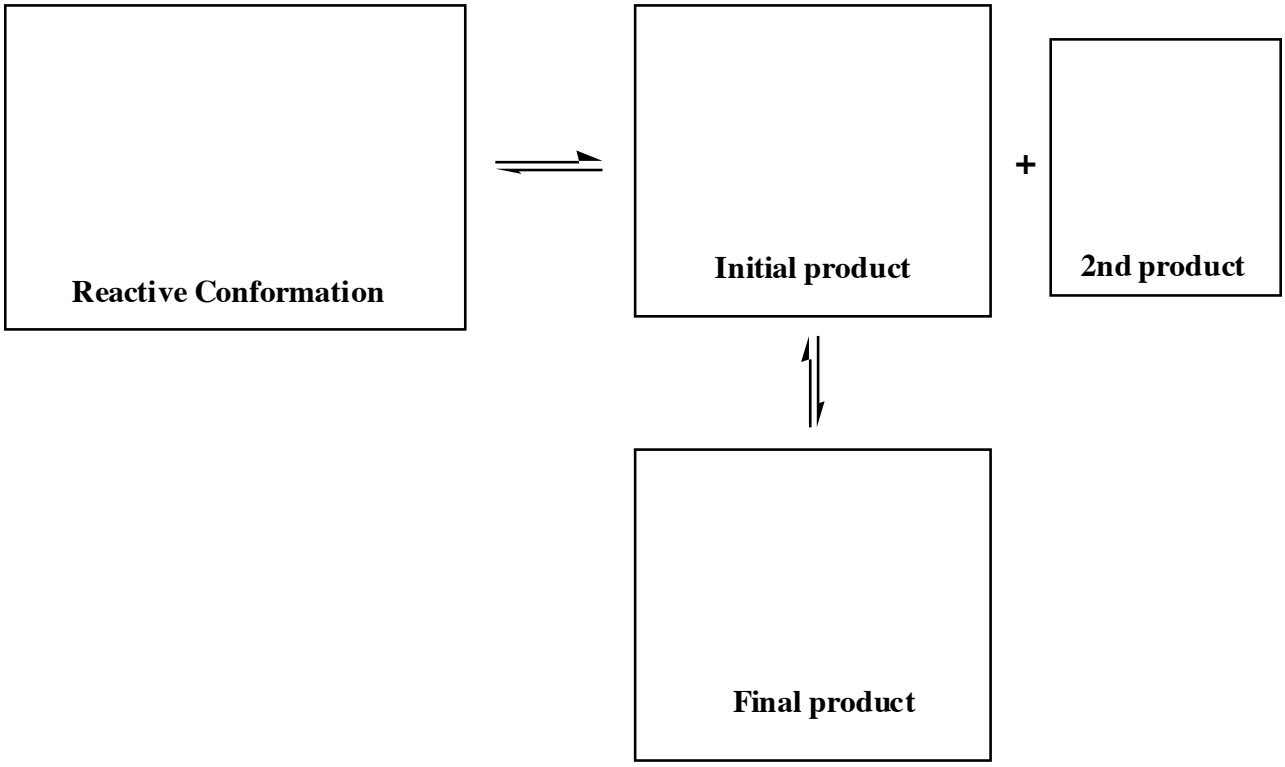
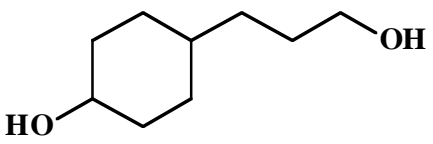
9. (12 pts.) The molecule drawn below undergoes a conformational change to give a new conformation that reacts to give two new products when heated. **Draw this reactive conformation in the box provided. Now, on the molecule you just drew, draw arrows to indicate the flow of electrons and then draw the stuctures of the two products initially produced.** Note that one molecule undergoes a further transformation to give the final stable product. **Draw the final stable product in the space provided. Make sure to draw all lone pairs and formal charges.**





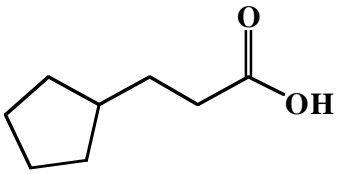
(3 or 5 pts each) Fill in the box with the product or products that are missing from the following chemical reaction equations. When a racemic mixture is formed, **you must write "racemic" under both structures EVEN THOUGH YOU DREW BOTH STRUCTURES**.



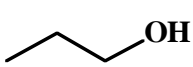
H_2CrO_4

H_2 / Pd

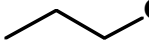
1) $LiAlH_4$ (excess)
2) H_2O



$SOCl_2$

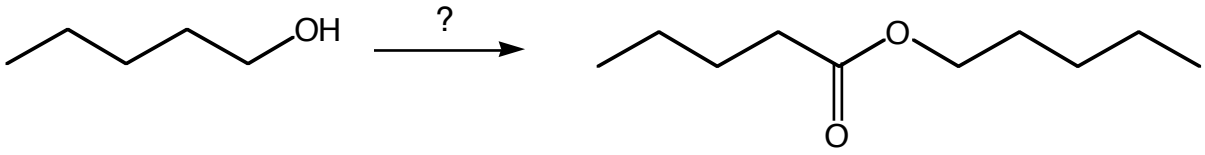


H_2SO_4
(catalytic amount)



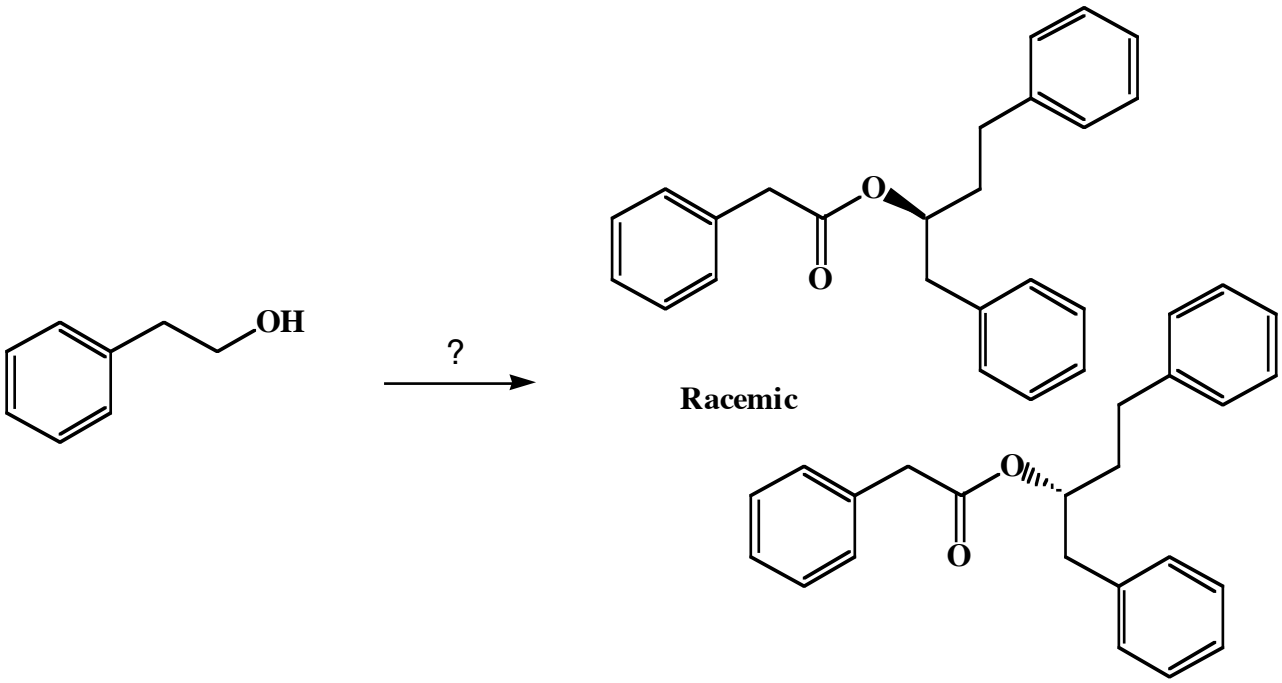
10. (7 pts) Using any reagents turn the starting material into the indicated product. All carbon atoms must come from the starting material. Draw all molecules synthesized along the way. When it doubt, draw the molecule! Hint: this should look familiar as a homework problem.

All of the carbons of the produce must come from the given starting material.



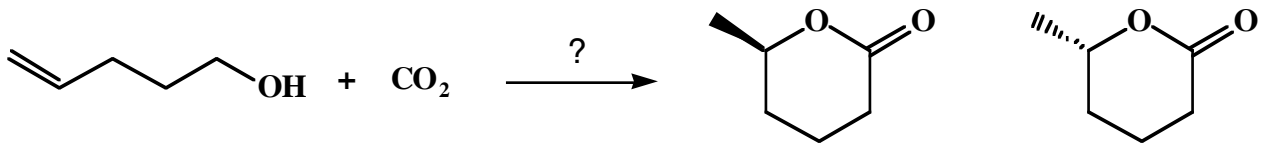
10. (17 pts) Using any reagents turn the starting material into the indicated product. All carbon atoms must come from the starting material. Draw all molecules synthesized along the way. When it doubt, draw the molecule! Hint: this should look familiar as a homework problem.

All of the carbons of the produce must come from the given starting material.



10. (13 pts) Using any reagents turn the starting material into the indicated product. All carbon atoms must come from the starting material. Draw all molecules synthesized along the way. When it doubt, draw the molecule! Hint: this should look familiar as a homework problem.

All of the carbons of the produce must come from the given starting material.



Racemic