Third Exam

Chemistry 3332

April 18, 2009

Name (PRINT) _____
Last, First

Signature _____

ID# _____

Please circle class time.

Dr. Bean's 10:00 AM

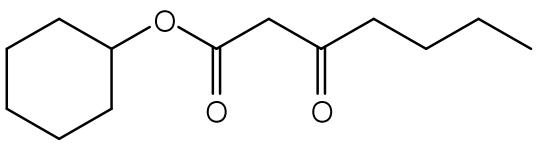
Dr. Bean's 1:00 PM

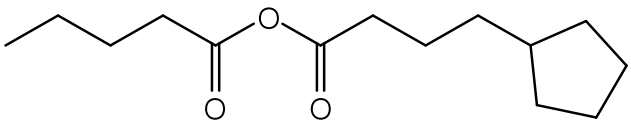
Page #	Score	
1. 16 pts.		
2. 12 pts.		
3. 18 pts.		
4. 18 pts.		
5. 12 pts.		
6. 12 pts.		
7. 12 pts.		

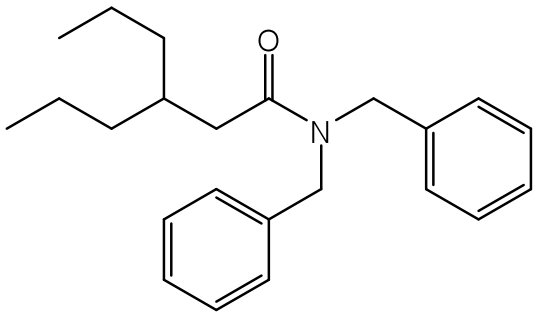
TOTAL _____

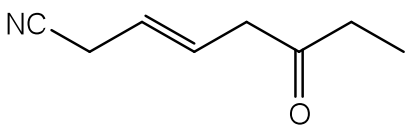
Note: Present your student ID when you return the exam booklet

A. Nomenclature: (16 points)
Give an acceptable IUPAC name for each of the following compounds. Be sure to indicate the **stereochemistry** where appropriate.

1. 

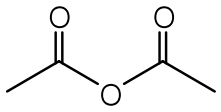
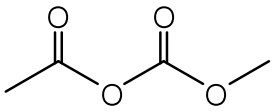
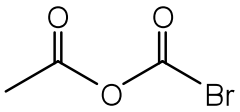
2. 

3. 

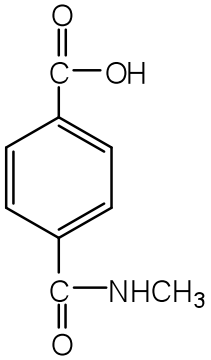
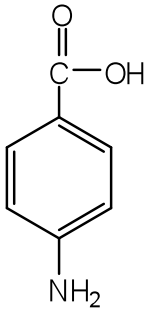
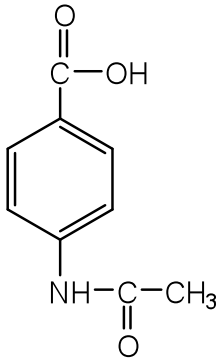
4. 

B. Facts: 12 points (3 points each)

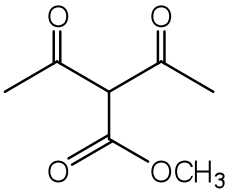
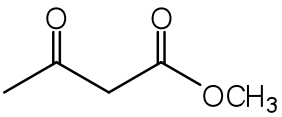
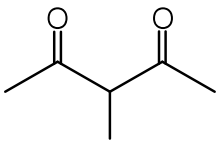
1. Rank the following compounds in order of increasing rate of nucleophilic acyl substitution. (1 = slowest rate, 3 = fastest rate)

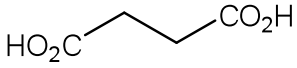
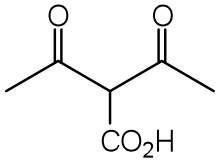
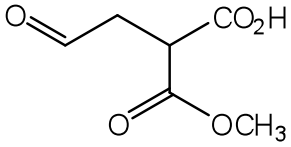
2. Rank the following compounds in order of increasing acidity. (1=least acidic, 3=most acidic)

3. Rank the following compounds in order of increasing acidity. (1=least acidic, 3=most acidic)

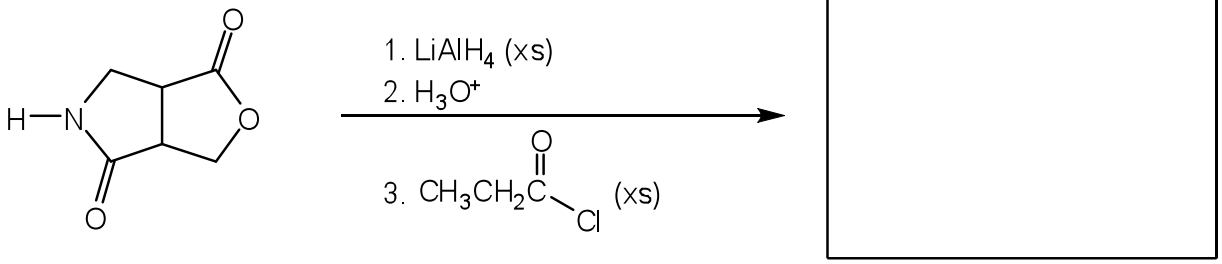




4. Consider the decarboxylation at 180*C of the following carboxylic acids. If decarboxylation is possible, place **Y** (for yes) in the box. If not, place **N** (for no) in the box.

C. Reactions: Total = 36 points, 6 points each
Please provide the reagents or major product in the answer box. Be sure your drawing indicates **stereochemistry** if applicable. Partial credit is awarded only when intermediate products in a multi-step reaction are shown below the reaction.

1.



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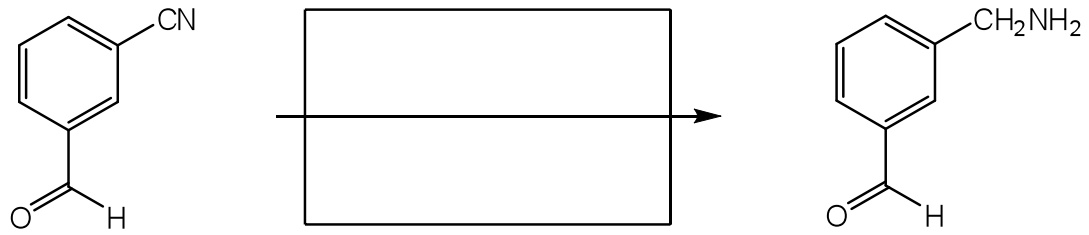
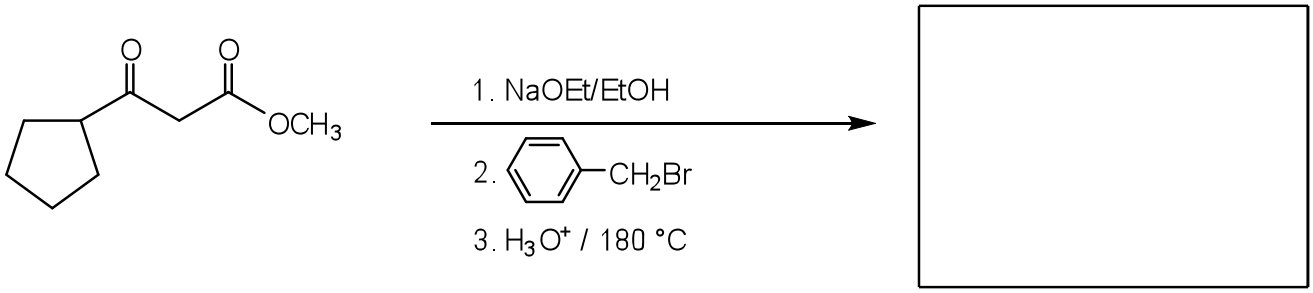
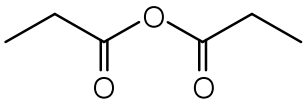


3.

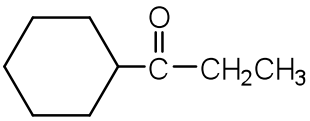


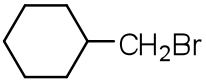
4.



1. H_2O
2. $(COCl)_2$
3. NH_3
4. $SOCl_2$

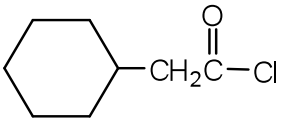
5.



1. LDA
2. 

Note: LDA = lithium diisopropylamide

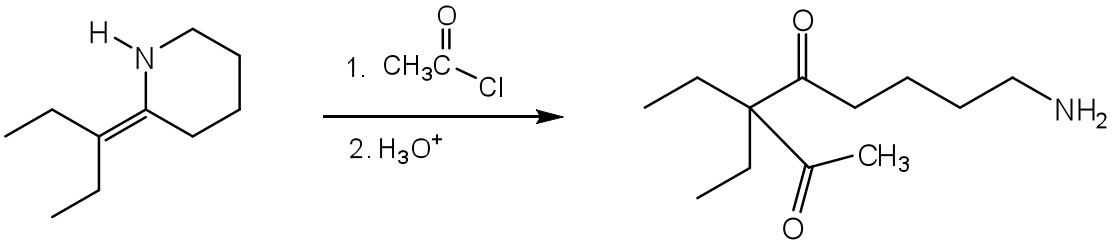
6.



1. $LiAlH(OtBu)_3$
2. NaOEt / EtOH / Heat

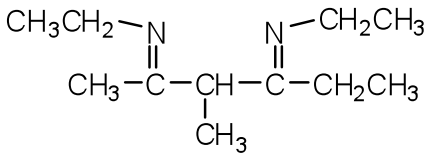
D. Mechanism: (12 points)

Provide a clear mechanism to explain the formation of the product. Use curved arrows to indicate "electron flow". Remember to show only one step at a time. **Show all intermediates and all formal charges. When more than one resonance contributor may be drawn, be sure to draw the most stable contributor.**



E. Synthesis: 12 Points

Synthesize the molecule below using any of the following reagents: any alkanes, alkenes, or alcohols of **three carbons** or less, any inorganic reagents, any oxidizing or reducing agents, and any peroxyacids.



F. Spectroscopy: 12 Points

A compound with the formula $C_9H_{16}O_3$ exhibits the IR, ^1H NMR and proton decoupled ^{13}C NMR spectra shown below. Please identify this compound and draw the structure in the box provided below.

Will add later this week of April 19, 2010.