Third Exam

Chemistry 3332

April 18, 2008

Name (PRINT) _____
Last, First

Signature _____

ID# _____

Please circle class time.

Dr. Bean's 10:00 AM

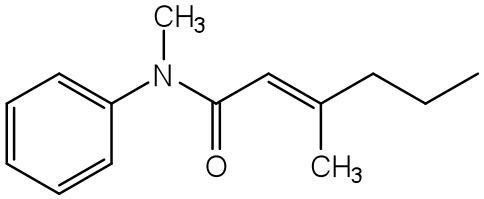
Dr. Bean's 1:00 PM

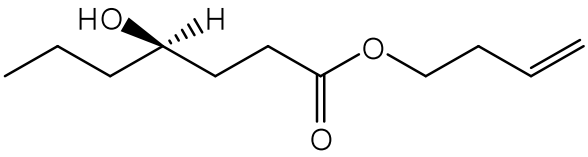
Page #	Score	
1. 15 pts.		
2. 12 pts.		
3. 18 pts.		
4. 18 pts.		
5. 12 pts.		
6. 13 pts.		
7. 12 pts.		

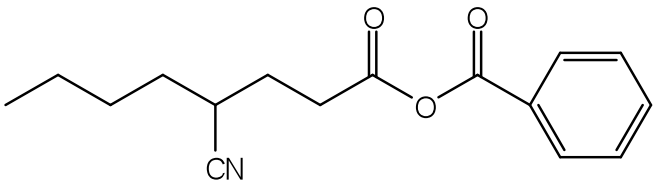
TOTAL _____

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

A. Nomenclature: (15 points)
Give an acceptable IUPAC name for each of the following compounds. Be sure to indicate the **stereochemistry** where appropriate.

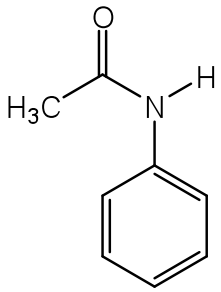
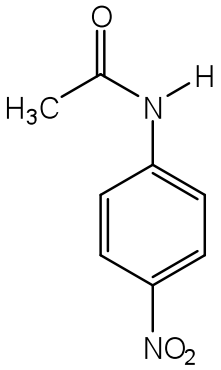
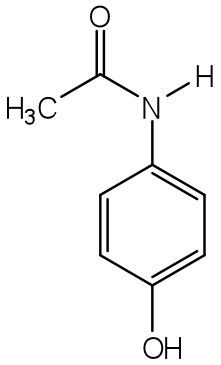
1. 

2. 

3. 

B. Facts: 12 points

1. Rank the following compounds in order of increasing reactivity with H_2O. (1 = slowest rate, 3 = fastest rate) (3 pts)

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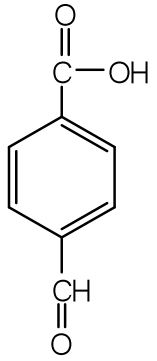
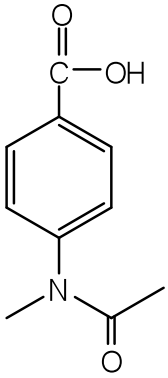
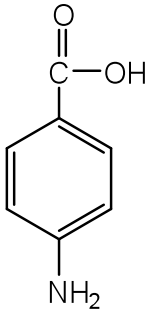
2. Rank the following compounds in order of increasing pKa. (1=lowest pKa, 3=highest pKa) (3 pts)

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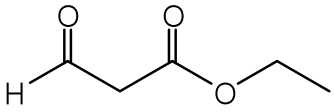
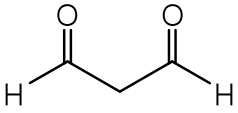
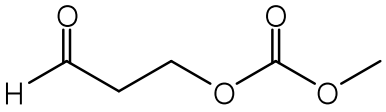
3. Rank the following compounds in order of increasing pKa. (1=lowest pKa, 3=highest pKa) (3 pts)

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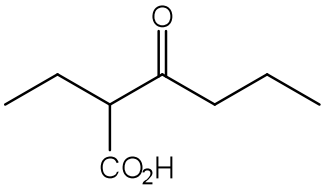
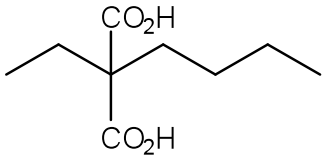
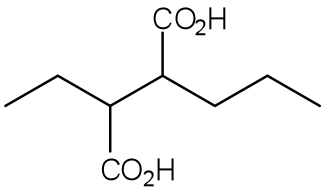
4. Consider the decarboxylation at 180*C of the following carboxylic acids. If decarboxylation is possible, place **Y** (for yes) in the box. If not, place **N** (for no) in the box. (3 pts)

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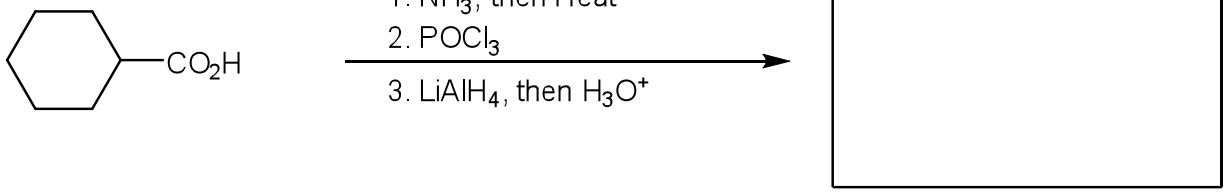
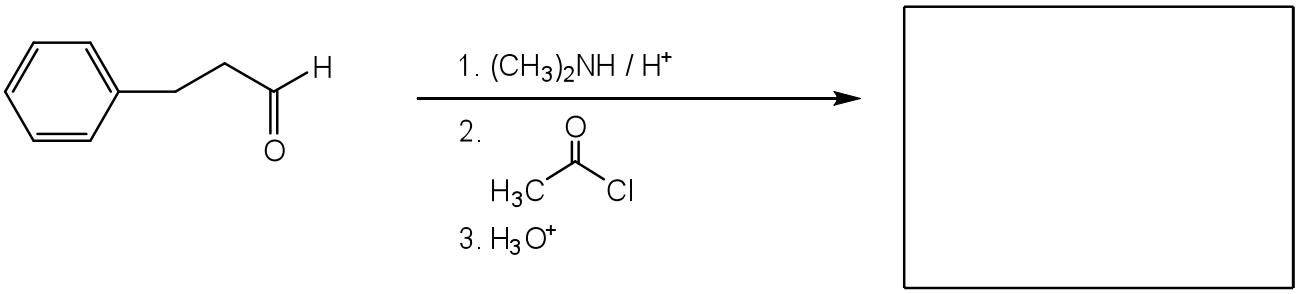
C. Reactions: Total = 36 points, 6 points each
Please provide the starting material, reagents or major product in the answer box. Be sure your drawing indicates **stereochemistry** if applicable. Partial credit is awarded only when intermediate products in a multi-step reaction are shown below the reaction.

1.

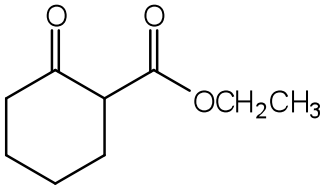


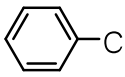
2.

3.

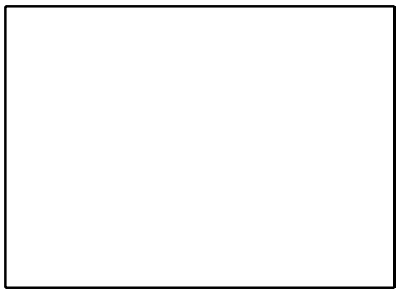


4.

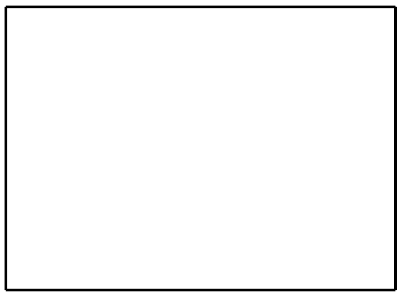


1. $NaOCH_2CH_3$ / CH_3CH_2OH
2. 

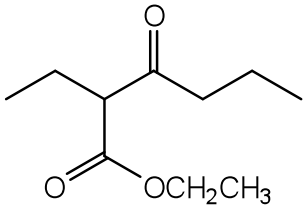
3. H_3O^+ / 180°C



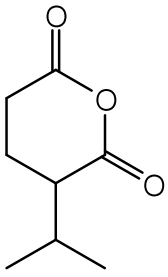
5.



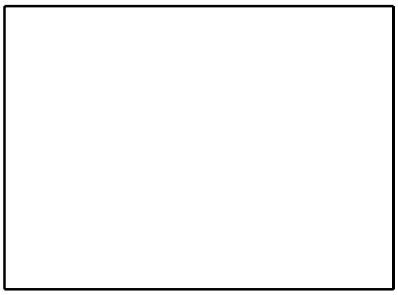
1. $NaOCH_2CH_3$ / CH_3CH_2OH
2. H_3O^+



6.

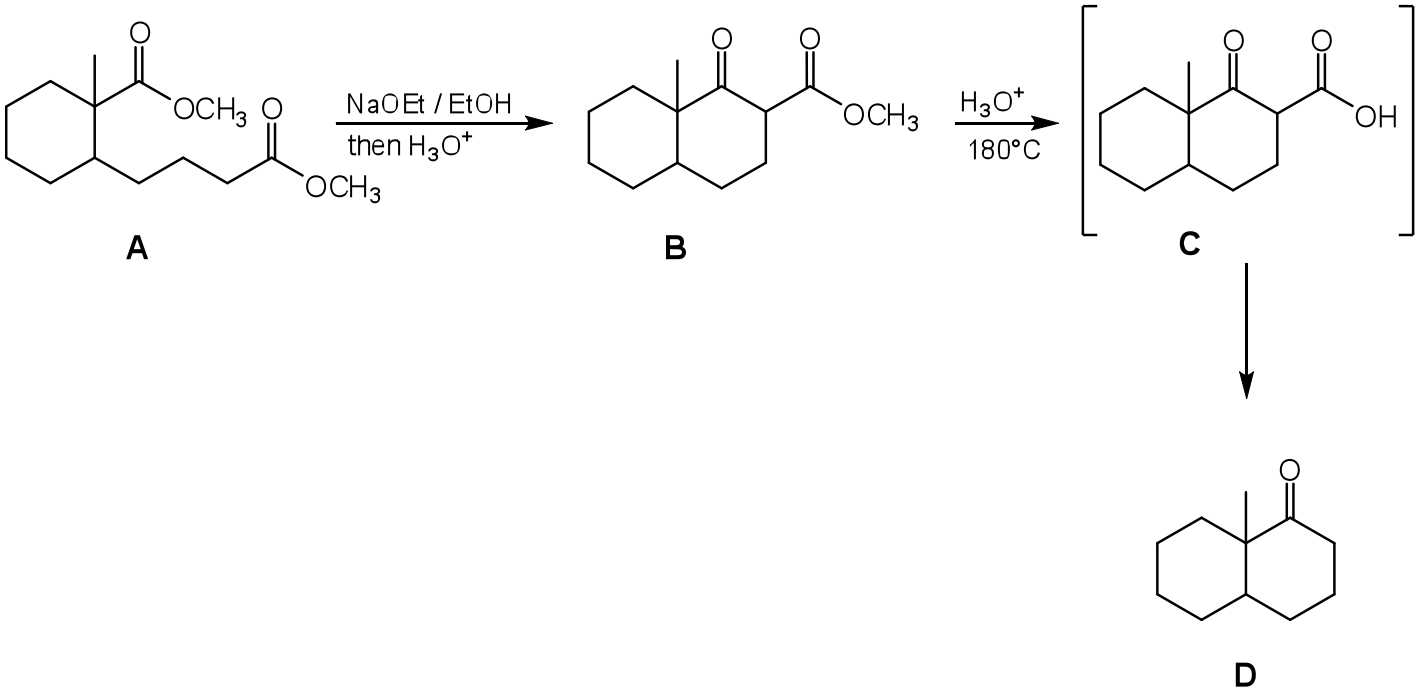


1. $CH_3CH_2NH_2$
2. $LiAlH_4$
3. H_3O^+



D. Mechanism: (12 points)

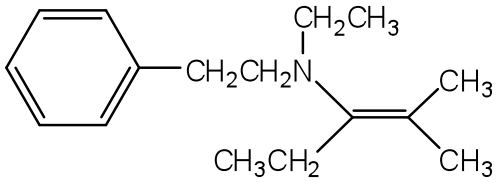
Provide a clear mechanism to explain the formation of the series of products below. **Do not** show the transformation of **B** to **C**. Remember to show only one step at a time (NO SHORTCUTS!). **Show all intermediates and all formal charges. When more than one resonance contributor may be drawn, be sure to draw the most stable contributor.**



A B C D

E. Synthesis: 13 Points

Synthesize the molecule below using any of the following reagents: benzene, bromobenzene, any alkenes, alcohols, or alkyl halides of **three carbons** or less; ethylene oxide; any inorganic reagents, oxidizing or reducing agents, and any peroxyacids.



F. Spectroscopy: 12 Points

A compound with the formula $C_6H_{13}NO$ exhibits the IR, ^{1}H 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.