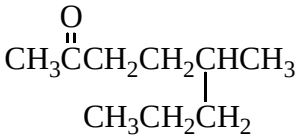
Chemistry 204 Name: _____
Spring 2001
Test 2

1. Provide correct IUPAC names for the following compounds (15 points):



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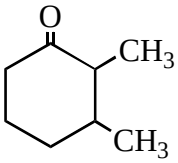

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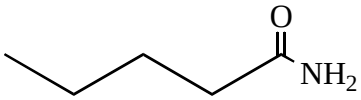

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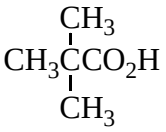

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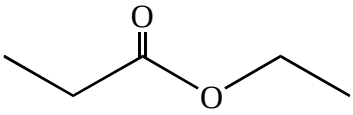

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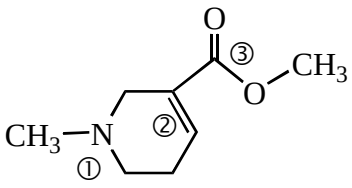
2. Identify the labeled functional groups in the following molecule. (9 points)



① _____

② _____

③ _____

3. Circle the compound with the highest solubility at a pH of 4. Briefly explain why. (5 points)

$CH_3(CH_2)_6CO_2CH_3$ $CH_3(CH_2)_6CO_2H$ $CH_3(CH_2)_6CH_2NH_2$

4. Place the following compounds in order of ***increasing*** water solubility. (6 points)

A = $CH_3CH_2CH_2CH_2CO_2Na$ **B** = $CH_3CH_2CH_2CH_2CO_2CH_2CH_3$

C = $CH_3CH_2CH_2CH_2CO_2H$ **D** = $CH_3CH_2CH_2CH_2CH_3$

5. Write out structures for the following compounds: (15 points)

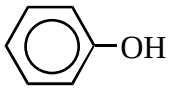
acetaldehyde –

acetone –

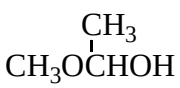
pentanedioic acid –

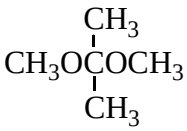
2-ethylbutanal –

sodium benzoate –

7. Arrange the following compounds in order of ***increasing*** acidity. (5 points)
A = H_2SO_4 **B** = CH_3OH **C** = $CH_3CH_2NH_2$ **D** = CH_3CO_2H **E** = 

8. Indicate where each of the following is an acetal, a hemiacetal, or something else. (5 points)





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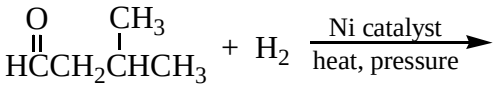
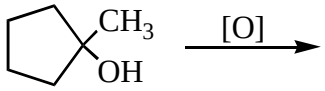
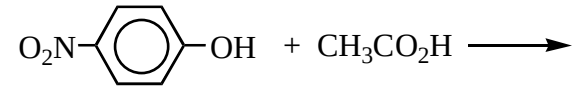
9. Write out condensed structures of the organic products of the following reactions. You need not provide the other products. If no reaction occurs, write "NR." (40 points)

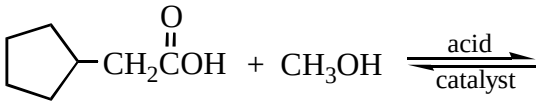
a) 

b) 

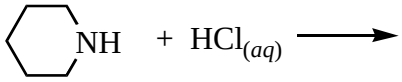
c) $CH_3CHO + CH_3CH_2CH_2OH \rightleftharpoons$

d) $CH_3CH_2CH_2\overset{\overset{O}{\|}}{C}H \xrightarrow{[O]}$

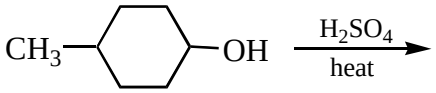
e) 

f) 

g) $CH_3CH_2\overset{\overset{O}{\|}}{C}Cl + CH_3OH \longrightarrow$

h) 

i) $CH_3\overset{\overset{O}{\|}}{C}O\overset{\overset{O}{\|}}{C}CH_3 + NH_3$ (excess) $\longrightarrow$

j) 

Bonus: Answer any two of the following three questions: (3 points each)

Define saponification –

What is the formula of the metal complex used for the Tollen's test?

Write out the equilibrium reaction for the weak base CH_3NH_2 and water.