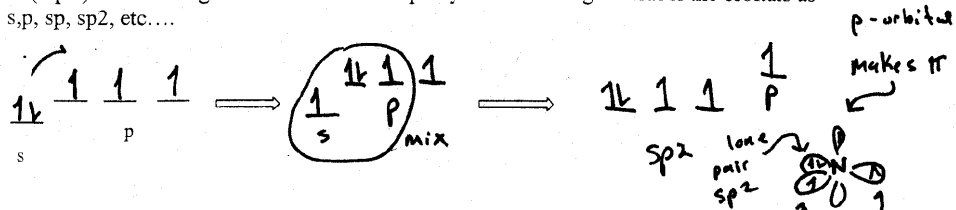
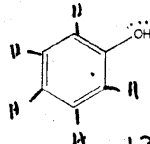


You may use molecular models. Keep your eyes on YOUR paper do not cheat in any way shape or form. Putting your name on this paper implies your adherence to the WFU code of academic conduct.

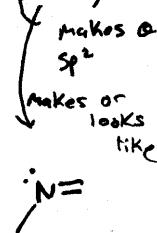
1. (8 pts) Provide single headed arrows for sp<sup>2</sup> hybridized nitrogen. Label the orbitals as s, p, sp, sp<sup>2</sup>, etc....



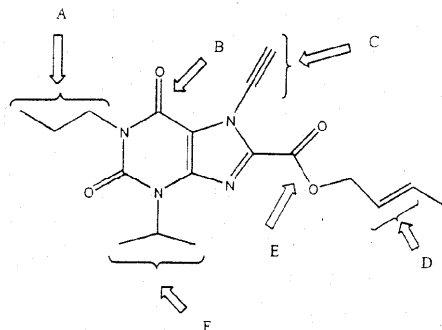
2. (9 pts) How many lone pair, sigma and pi bonds are in the following molecule?



Sigma	13
Pi	3
Lone Pair	2



3. (26 pts, 2 pt each) Consider the following molecule:

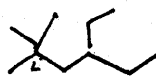


Group	Question	Answer
A	Name of carbon chain	<u>propyl</u>
A	Hybridization of carbons	<u>sp<sup>3</sup></u>
B	Name of functional group	<u>ketone (amide with N)</u>
B	Hybridization of carbon	<u>sp<sup>2</sup></u>
C	Name of <del>carbon chain</del> <sup>functional group</sup>	<u>alkyne</u>
C	Hybridization of carbons	<u>sp</u>
D	Name of <del>carbon chain</del> <sup>functional group</sup>	<u>alkene</u>
D	Hybridization of carbons	<u>sp<sup>2</sup></u>
E	Name of functional group	<u>ester</u>
E	Hybridization of carbon	<u>sp<sup>2</sup></u>
F	Name of <del>carbon chain</del> <sup>alkyl</sup>	<u>iso-propyl</u>
F	Hybridization of carbons	<u>sp<sup>3</sup></u>

What group contains the most acidic proton(s) C (sp C-H)

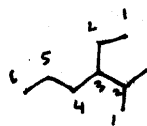
4. Draw the following molecules:

(2 pts) a. 2,2-dimethyl-4-ethylhexane



better name: 4-ethyl-2,2-dimethylhexane

(4 pts) b. Why is 4-ethyl-5,5-dimethylpentane not a good name? Draw and rename.

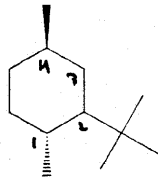


3-ethyl-2-methylhexane

or

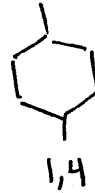
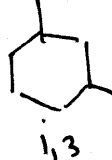
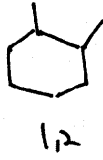
3-(iso-propyl)hexane

(8 pts) c. Name the following:

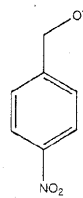
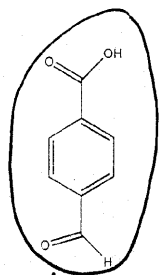


need (trans) here for the methyl  
2-tert-butyl-1,4-dimethylcyclohexane

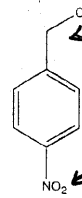
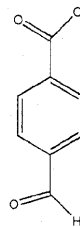
5. (10 pts) Draw all the constitutional isomer of dimethyl cyclohexane.



6. (10 pts) Circle the stronger acid and briefly justify your reason(s)? Which way does this reaction go?



To right

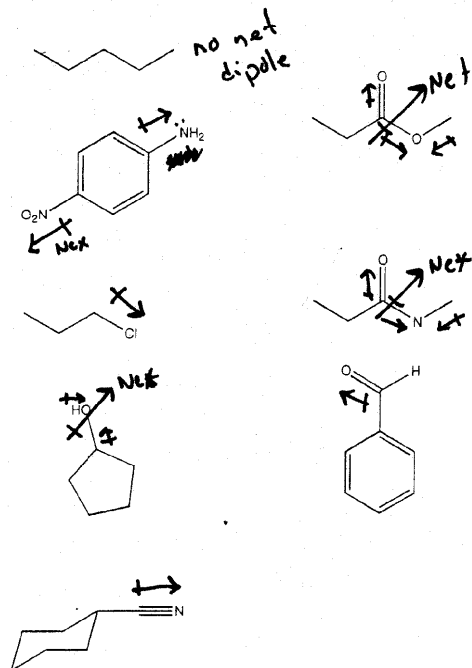


No resonance

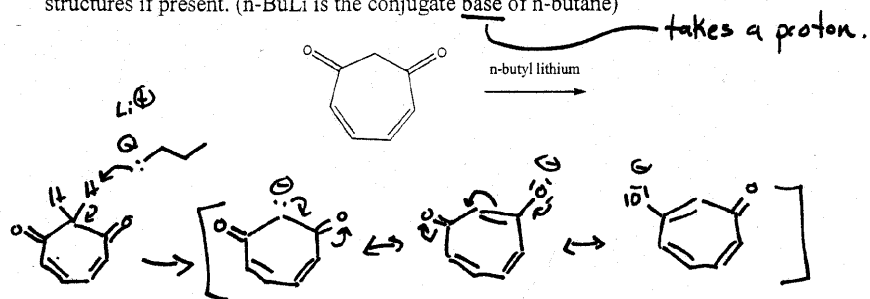
Inductive effect is less than resonance in other acid

resonance in carboxylic acid

7. (16 pts) Draw the dipoles on the following functional groups: (be precise)



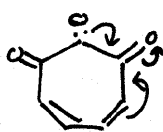
8. (15 pts) Draw the structure(s) for the following product(s). Include any resonance structures if present. (n-BuLi is the conjugate base of n-butane)



(5 pts) Do you think converting the carbon-carbon double bonds to saturated single bonds would make the reaction more or less favorable? Why?

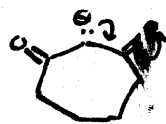
more reactive in saturated compound.

Carbonyl's shared with alkenes



Carbonyl's not shared

vs.



Both the negative charge & pi electrons are "competing" for the carbonyl. So it's "harder" to push the negative charge into the carbonyl. This is absent in the saturated compound.

9. (15 pts) Provide arrows and/or products for the following reaction

