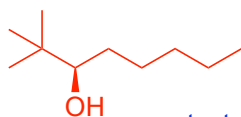
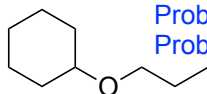


1. (14 points) Provide the name or structure of each of the molecules shown below.



see text:
Prob: 12.30d

(R)-2,2-dimethyl-3-octanol
(6 pts)



propoxycyclohexane
or
propyl cyclohexyl ether

see text:
Prob: 13.1b
Prob 13.26a

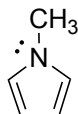
(4 pts)



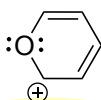
see text:
Prob: 16.30a

1,4-cyclohexadiene
(4 pts)

2. (8 points) Assuming the compounds below are flat and atoms that have a lone pair (drawn or not drawn) are sp^2 or sp hybridized, indicate whether the compounds are aromatic, antiaromatic, or neither.



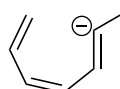
aromatic
antiaromatic
neither



aromatic
antiaromatic
neither

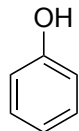


aromatic
antiaromatic
neither

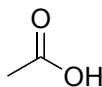


aromatic
antiaromatic
neither

3. (4 points) Estimate the pka values for the following compounds.



10



5



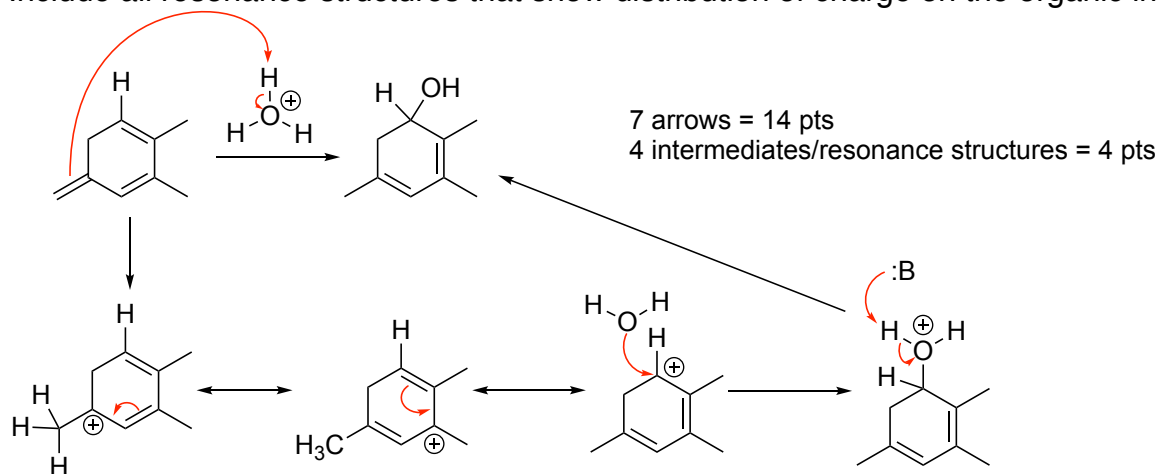
14



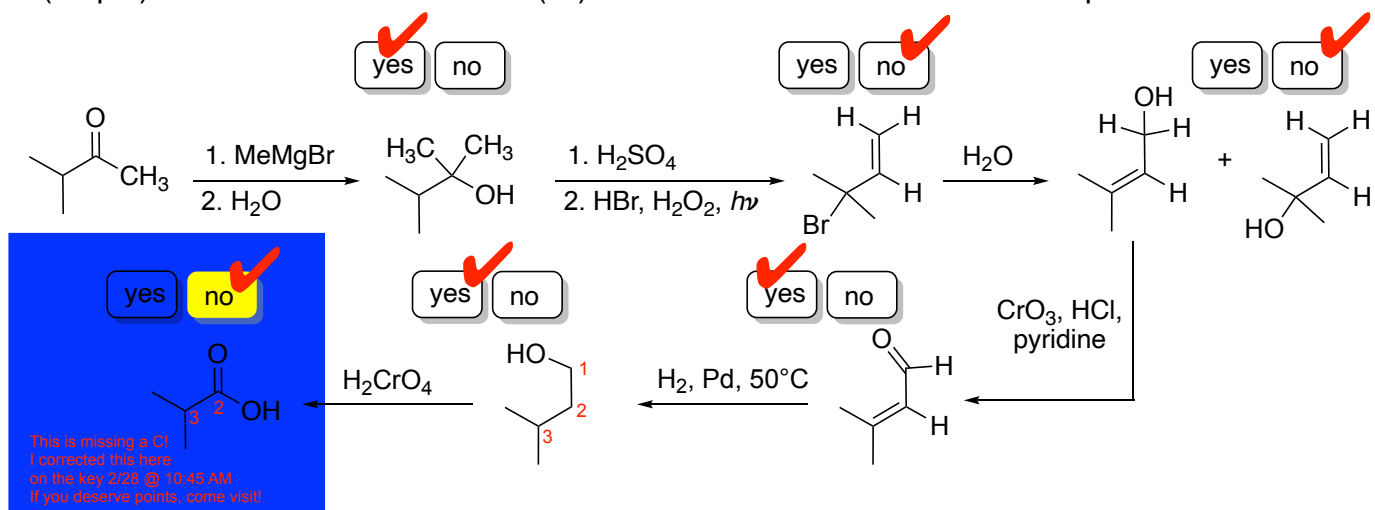
25

18 pts

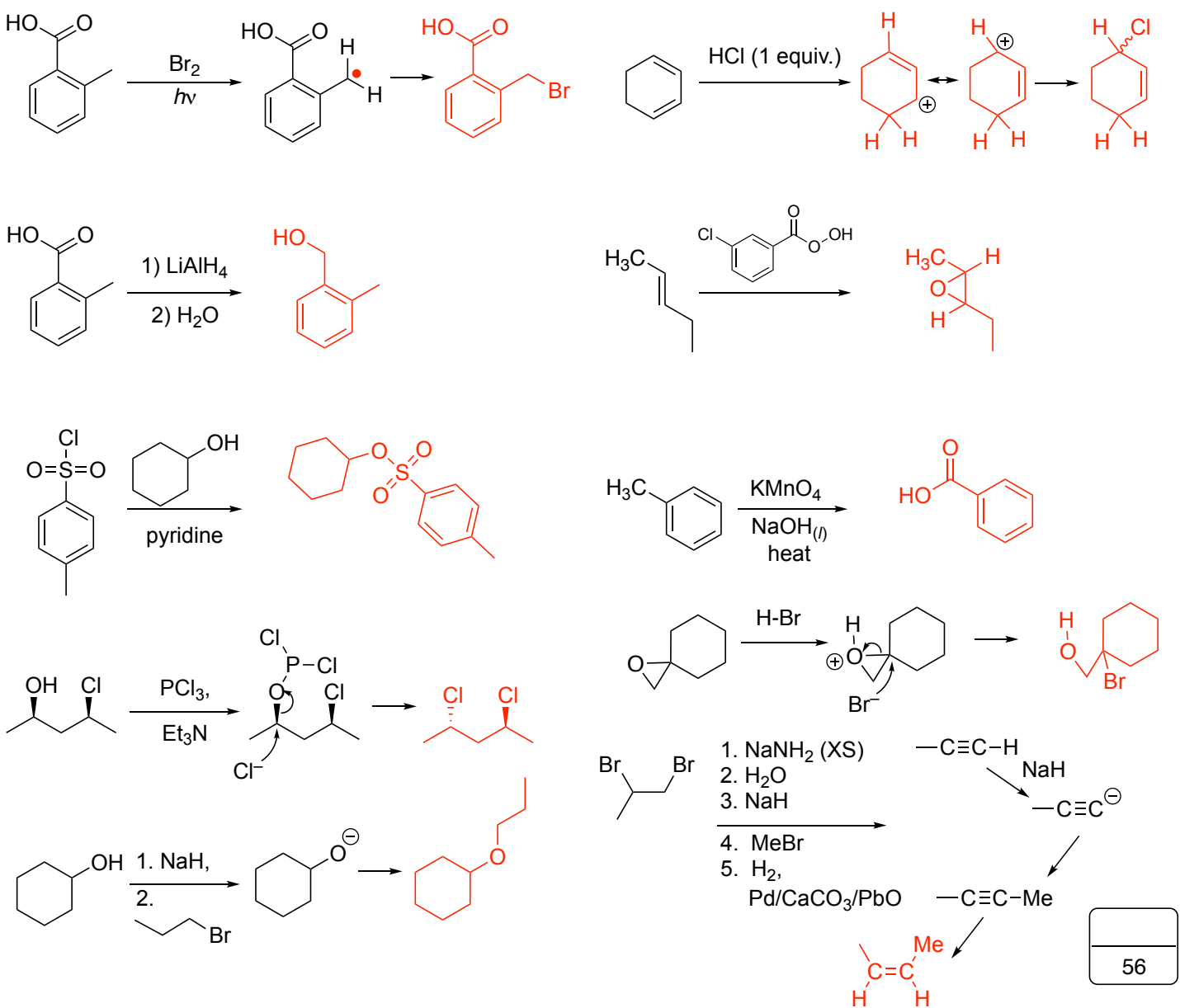
4. (18 points) Provide a very detailed arrow pushing mechanism for the following reaction. Include all resonance structures that show distribution of charge on the organic intermediate(s).



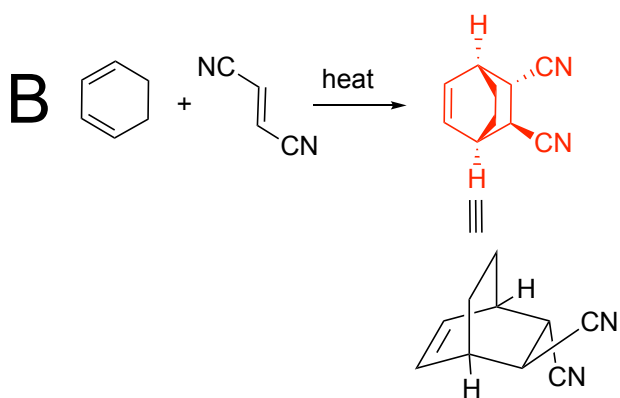
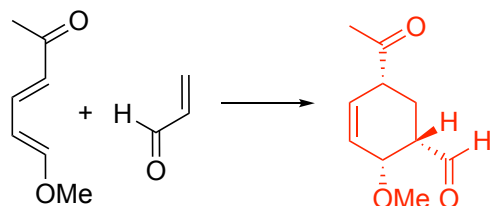
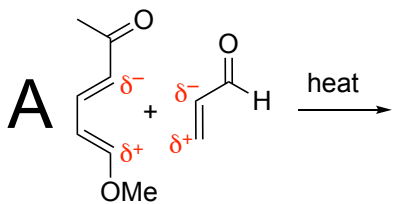
5. (12 pts) Indicate with a checkmark (✓) whether the 6 reactions below will proceed as written.



6. (44 pts) Provide the major product for each of the following reactions. Be careful to account for the regiochemistry and stereochemistry in each transformation.



7. (10 pts) Provide the major product for the following Diels-Alder reactions. Relative stereochemistry and regiochemistry is very important.



8. (17 pts) Provide the components for the retrosynthetic steps below.

