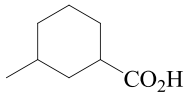
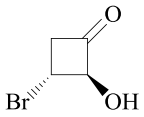
Chemistry 248, Sample Exam 2 – Hanson 2012

(12) 1. Name the compounds shown on the right.

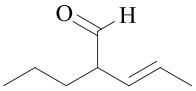


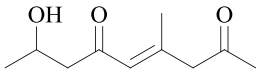


(8) 2. Draw structures for the following compounds:

a) the imine produced from reaction of cyclopentanamine with cylohexanecarbaldehyde

b) acetaldehyde hydrate

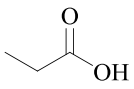




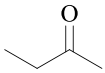
c) a carboxylic acid more acidic than 2-bromopropanoic acid (and explain why)

d) the hydrocarbon product of cyclohexanone reacting with any Wittig reagent

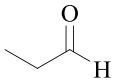
(10) 3. Explain how you would distinguish among the three compounds on the right using IR *and* NMR spectroscopy (both). Your answer might take the form, "Compound A is the only one with…" or "Compound B would have …. while Compound C would have…" Something like that. *Provide only as much analysis as necessary, and use both IR and NMR, not just one.*



A

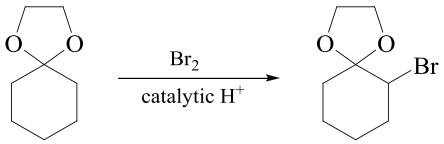


B

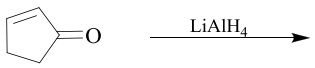


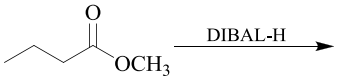
C

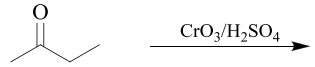
(10) 4. Write a plausible mechanism for the following transformation. Hint: Think about what H^+ and Br_2 react with, and take it step by step. It should take four or five steps.

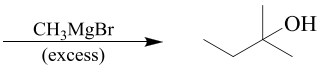


(24) 5. In each case, give the major product or show the reactant that would be needed to make the product shown given the reaction conditions provided. In each case assume that water is added at the end of the reaction. If you think no reaction will occur, say so.

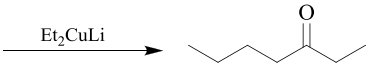
a) 

b) 

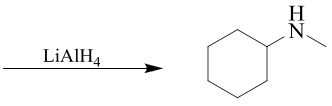
c) 

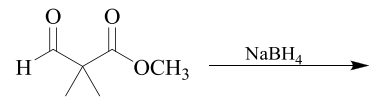
d) 

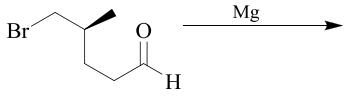
(two totally different answers -- 1 pt bonus for both)

e) 

(two totally different answers -- 1 pt bonus for both)

f) 

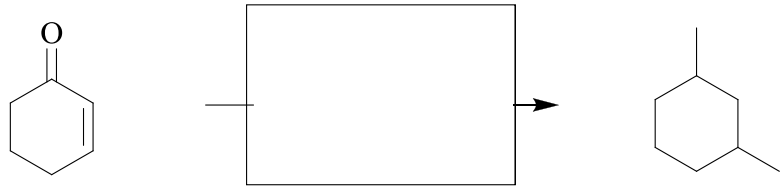
g) 

h) 

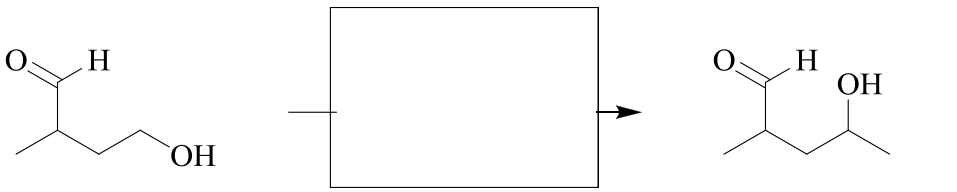
(think about it...)

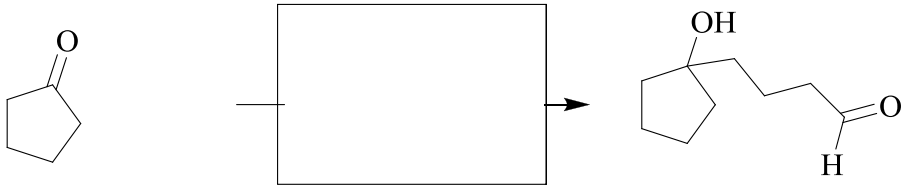
(20) 6. In each case, indicate what reagents or sequence of reagents might be required to effect the indicated transformation. Use as many steps as you want. Be on the alert for the need for protecting groups.

a) 

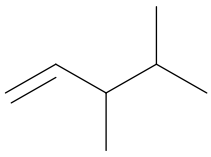
b) 

c) 

d) 

e) 

(16) 7. On the next page, describe a synthesis of the following compound from organic compounds having no more than three carbons (reagents such as PPh_3 excepted).



(for full credit, show reagents required)