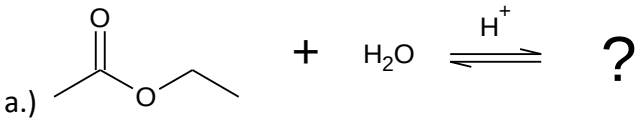
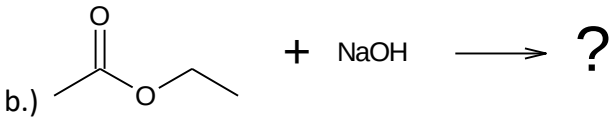
CHEMV12B, Organic Chemistry II

1.) Give the complete arrow-pushing mechanisms for the following reactions. Show all formal charges and any lone pairs or bonds involved in the reaction. (52 pts)

a.)



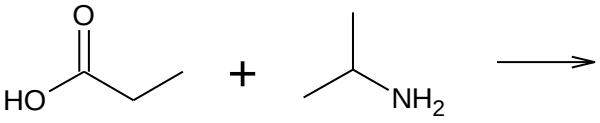
b.)

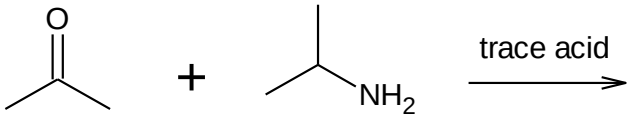


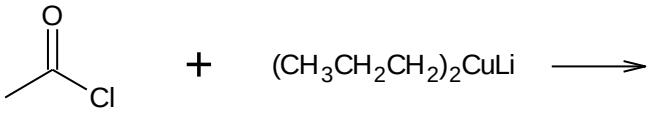
2.) Give **two** reasons why the addition of an acid catalyst for the hydrolysis of an ester *increases* reaction rate/ease. (10 pts, 5 pts ea)

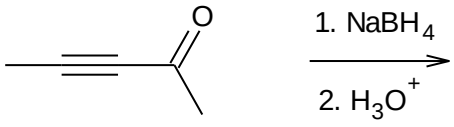
3.) Which has the *more acidic* α-hydrogen: an ester or a ketone? **Explain.** (10 pts)

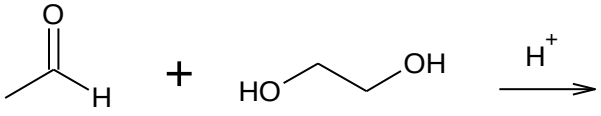
4.) Give the structure of the **major organic product(s)** of each reaction. (70 pts, 10 pts ea)

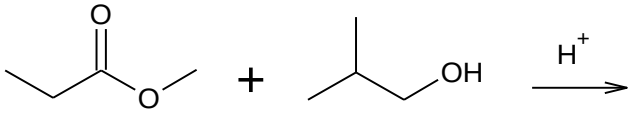
a.) 

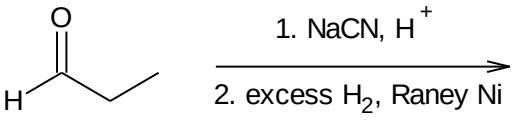
b.) 

c.) 

d.) 

e.) 

f.) 

g.) 

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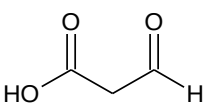
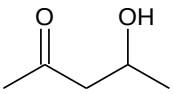
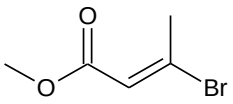
5.) Give the correct systematic (IUPAC) name for the following compounds. If the molecule has a common name, you may include it for extra credit. (30 pts, 6 pts ea)



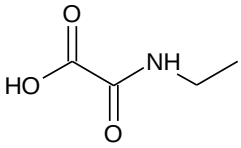
(A)



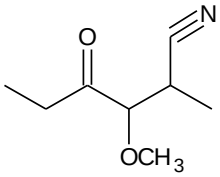
(B)



(C)



(D)



(E)

(A) _____

(B) _____

(C) _____

(D) _____

(E) _____

6.) **Explain** why transesterification (ester + alcohol) requires an acid catalyst but aminolysis (ester + amine) does *not*. (10 pts)

7.) Give the line-angle structures of the following compounds. (18 pts, 6 pts ea)

a.) diethyl ketone

b.) ethyl 4-hydroxy-3-oxoheptanoate

c.) 3-cyano-N,N-dimethylpentamide