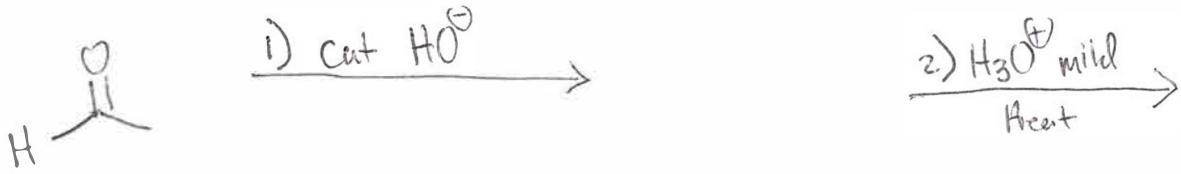
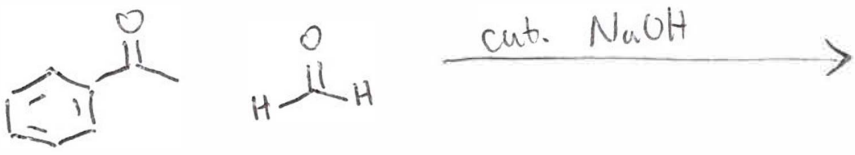
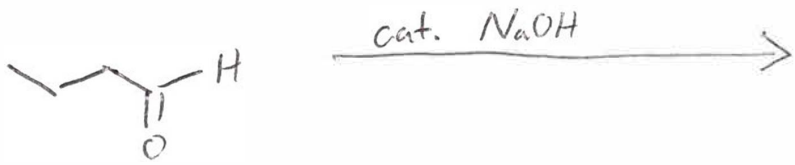
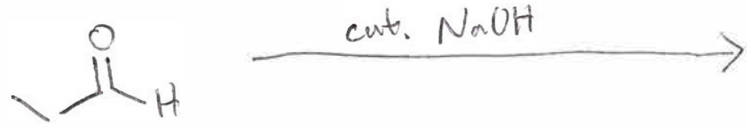
(1)

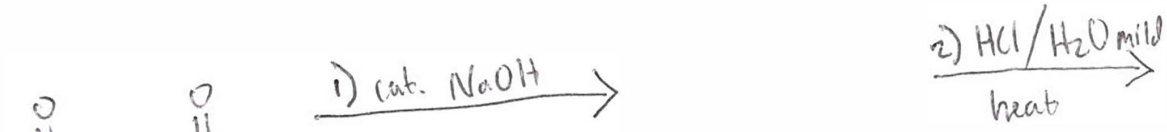
Practice Problem Session

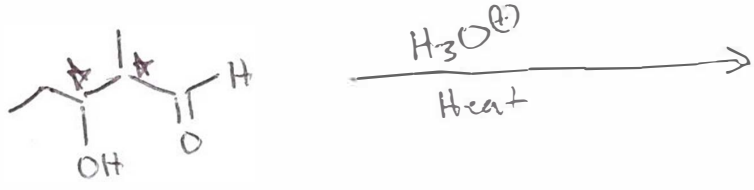






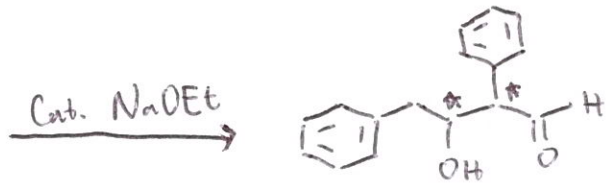






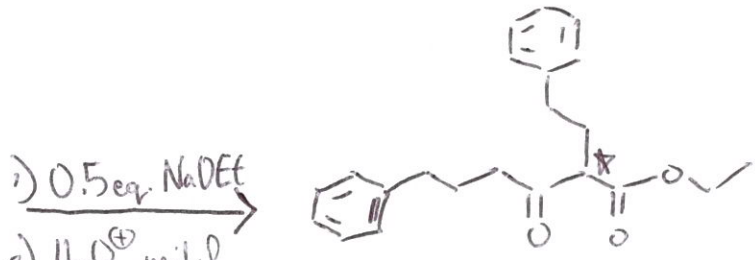
racemic

(2)



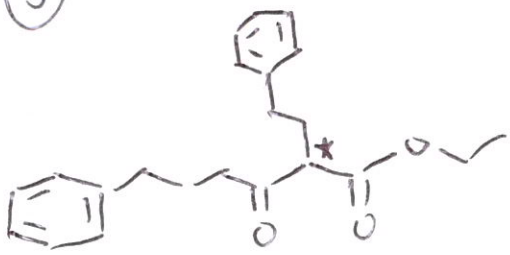
racemic

racemic



racemic

(3)



H_2O

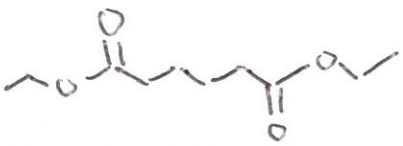
Cat. H_2SO_4

Heat

Cat. NaOH

$H_3O^{\oplus}$

Heat

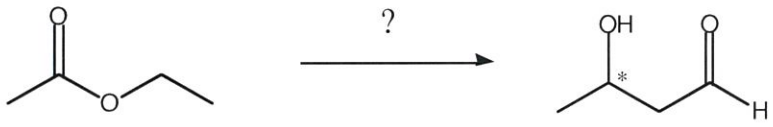


1) 1.0 NaOEt

2) Mild Acid

21. For the following synthesis questions, show how the starting material can be converted into the product. Show ALL intermediate molecules synthesized along the way, and show the reagents needed for each step. To get full credit, you must use the predominant product expected for each step. All of the carbon atoms of the product must come from the starting material(s).

(7 pts)



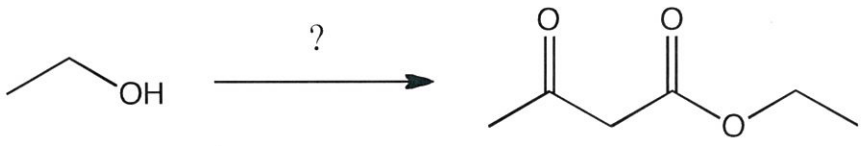
Racemic

17. (10 pts) Using any reagents turn the starting material into the indicated product. All carbon atoms must come from the starting material. Draw all molecules synthesized along the way. When in doubt, draw the molecule! Label all chiral centers with an asterisk (*) and make sure to right "Racemic" where appropriate. Hint: this should look familiar as a homework problem.

Remember, all of the carbons of the product must come from the given starting material.

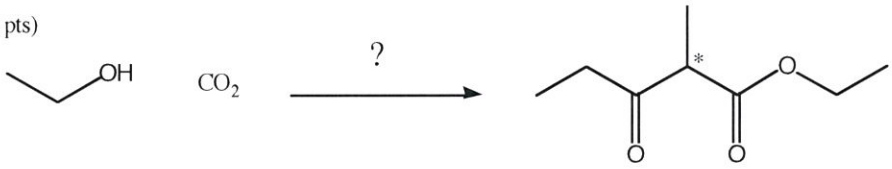
(10 pts)

A)



21. For the following synthesis questions, show how the starting material can be converted into the product. Show ALL intermediate molecules synthesized along the way and show the reagents needed for each step. To get full credit, you must use the predominant product expected for each step. All of the carbon atoms of the product must come from the starting material(s).

(16 pts)



Racemic

17. (cont. 19 pts) Using any reagents turn the starting material into the indicated product. All carbon atoms must come from the starting material. Draw all molecules synthesized along the way. When in doubt, draw the molecule! Label all chiral centers with an asterisk (*) and make sure to right "Racemic" where appropriate.

Remember, all of the carbons of the product must come from the given starting material.