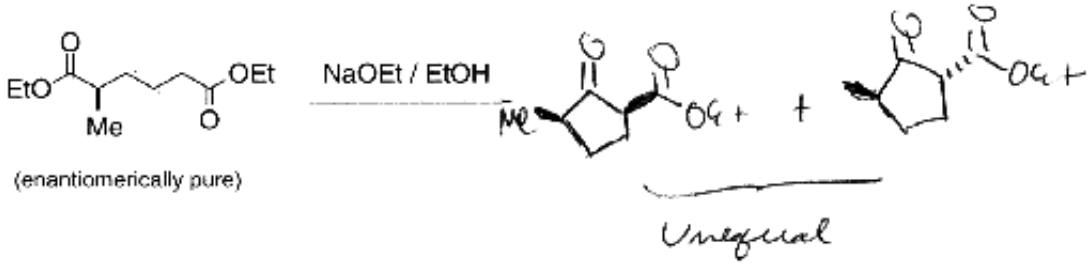
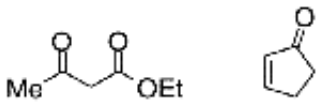
1) Provide the products of the following reactions. If no reaction would occur, then write NR. Draw all possible stereoisomers and indicate if they would be produced in equal or unequal amounts. If they are formed in unequal amounts, indicate the major isomer. Be sure to write the structure of the intermediates "A." (5 points each)

A) 

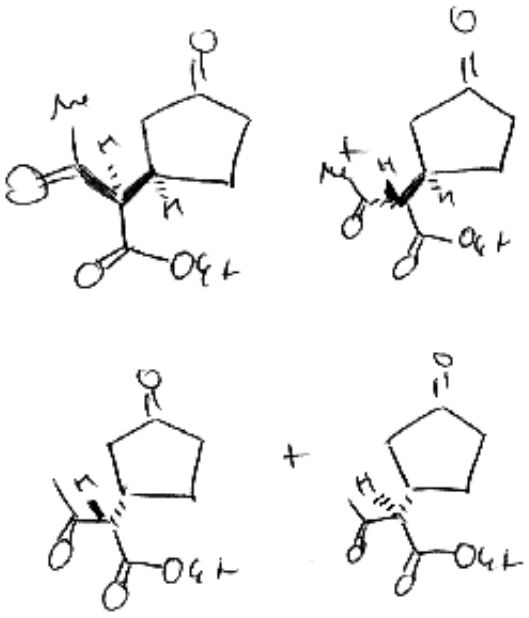
(enantiomerically pure)

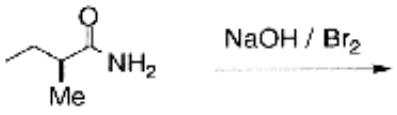
B) 

N. R.

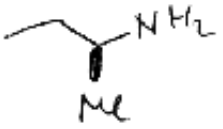
C) 

Not equal



D) 

(enantiomerically pure)



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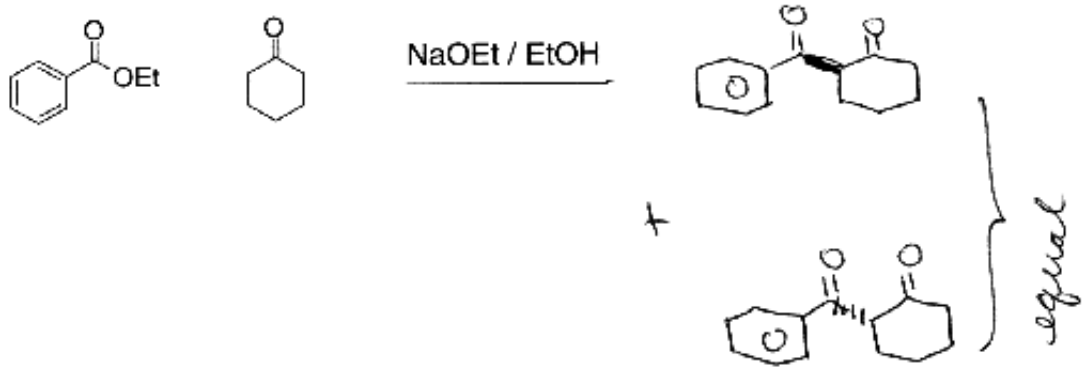
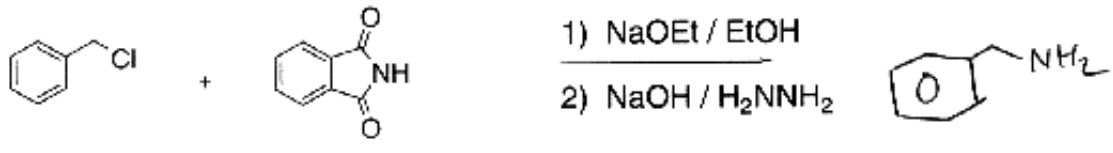
E)



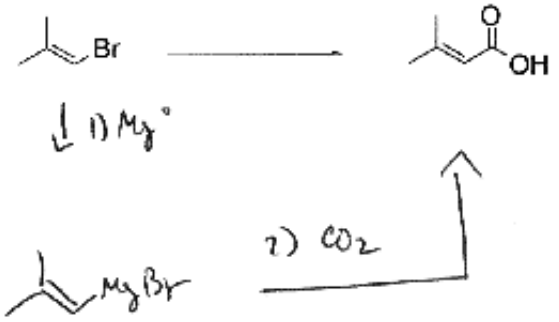
Г)



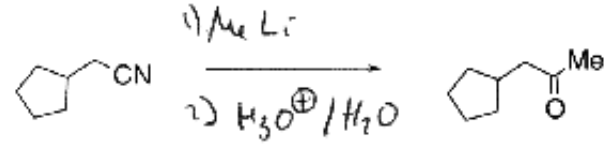
Don't forget to draw all the stereoisomers for each reaction!

2. Please provide reagents for accomplishing the following transformations. The method you use should be the most efficient method we have discussed. Some transformations may require more than one step. You may use any inorganic reagents you wish, and organic reagents of **3 carbons or less**.

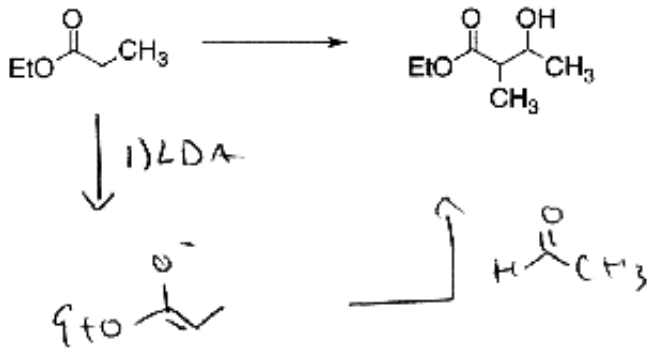
A)



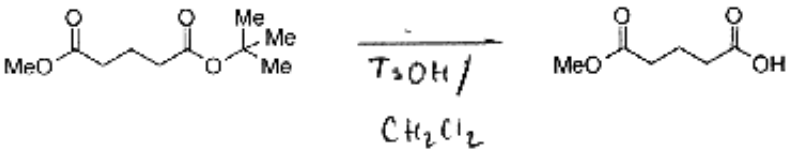
B)



C)

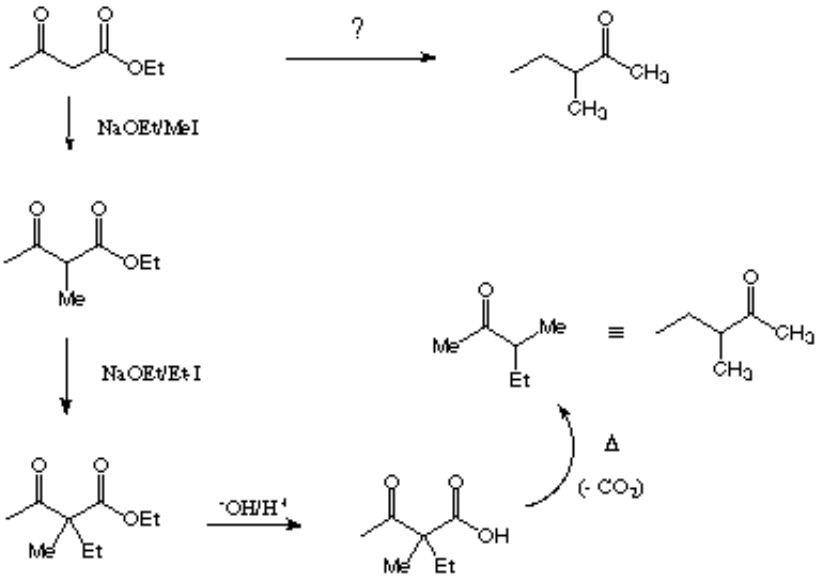


D)

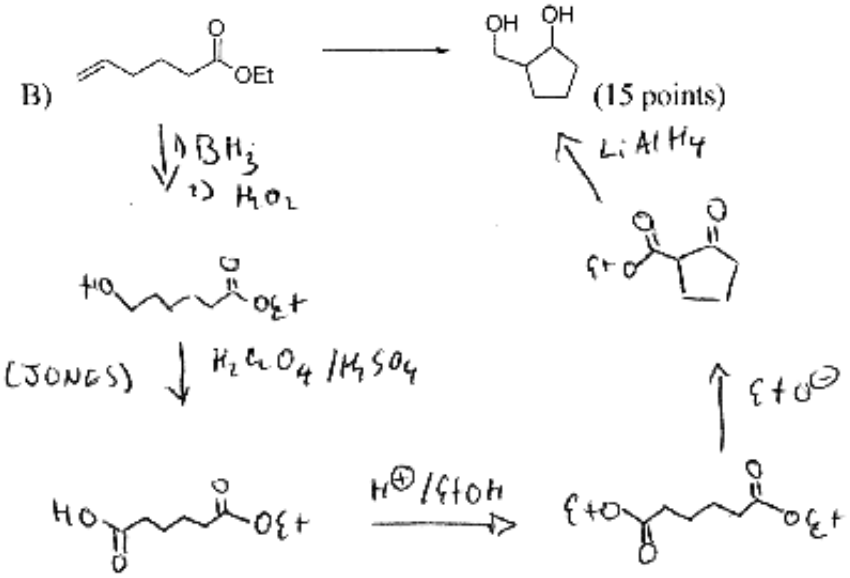


3 Complete the three syntheses shown below using organic reagents of 3 carbons or less and any inorganic reagents you wish. **If you want partial credit, then write the product of each reaction.**

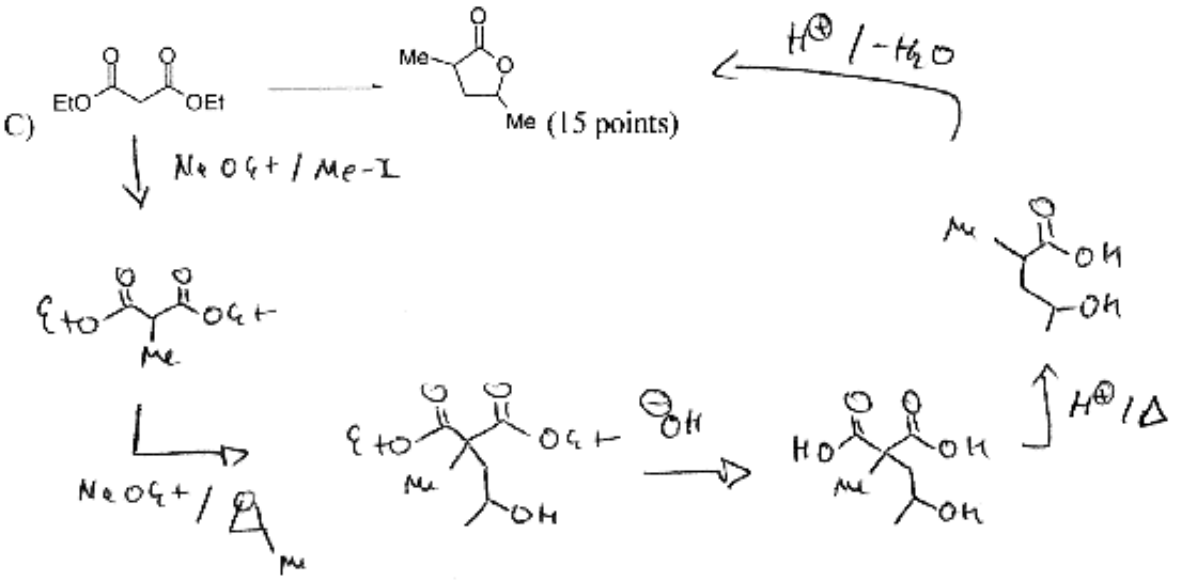
A)



B) (15 points)



C) (15 points)



4) Provide the product and mechanism for the reaction shown below. Be sure to draw each arrow and show each step of the reaction for full credit. (10 points)