

Chemistry 3331-001 **3<sup>rd</sup> Hour Exam**  
Ch. 18 Carbonyl Chemistry 2  
Ch. 19 Carboxylic Acids  
Ch. 20 Carboxylic Acid Derivatives

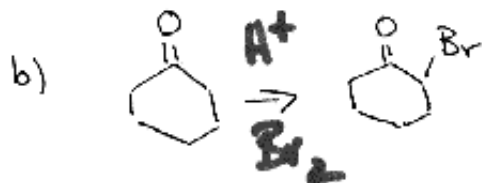
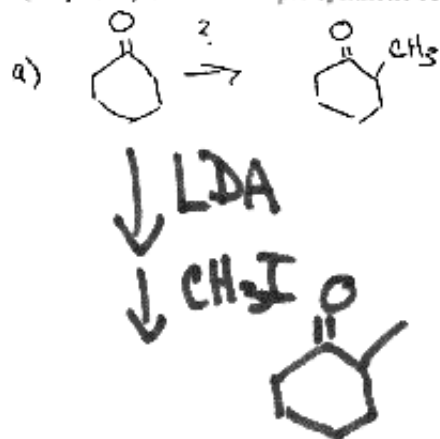
Thursday: Nov. 19, 1998 in Ramaley C250

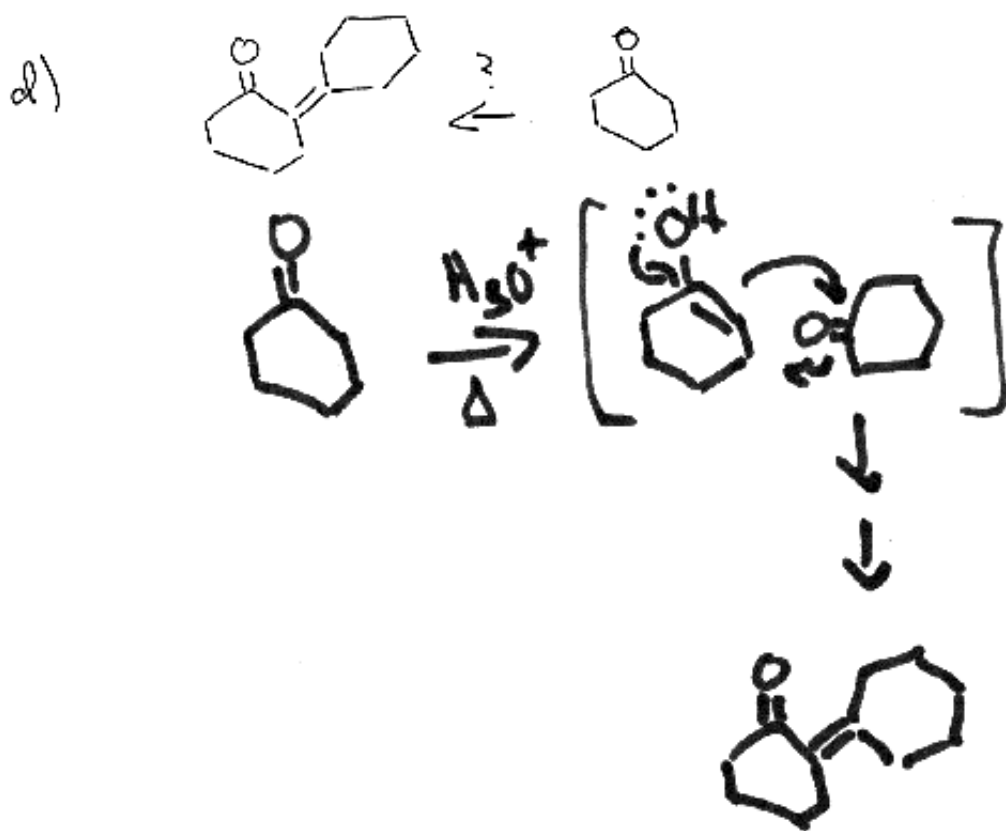
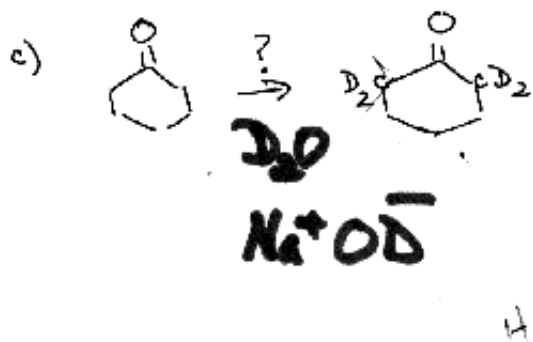
Dr. Barney Ellison

Name: Key

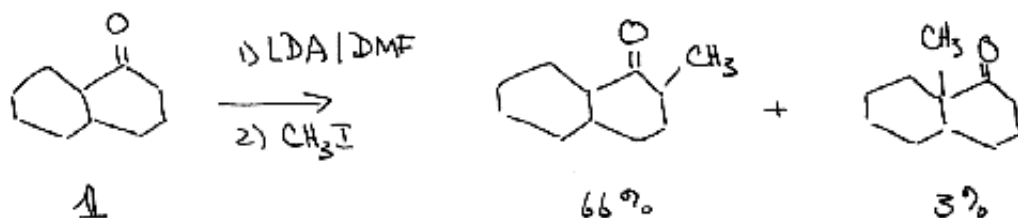
Score: \_\_\_\_\_

1. (20 points) Provide simple synthetic routes from cyclohexanone to the following:

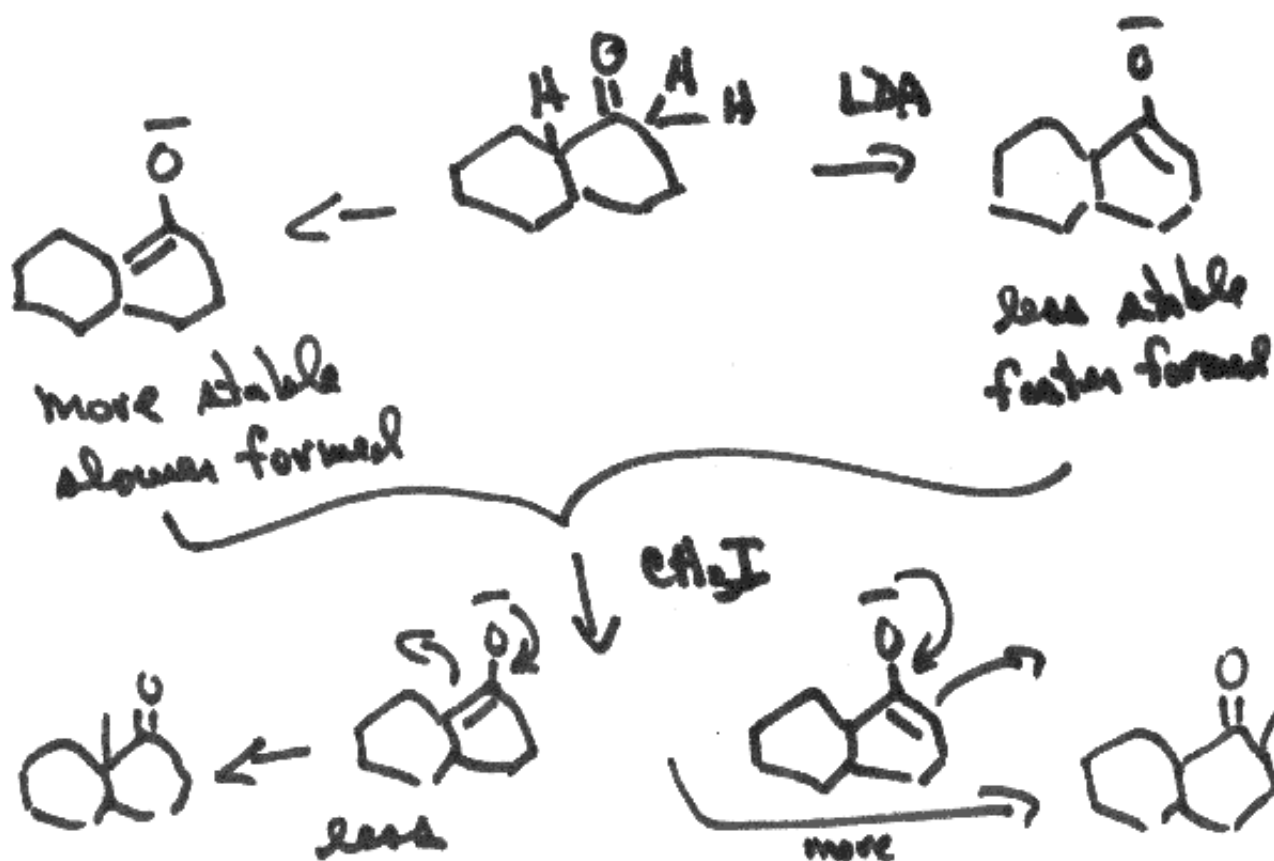




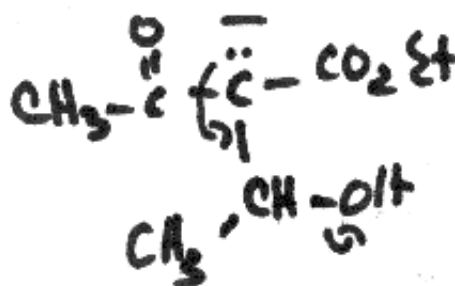
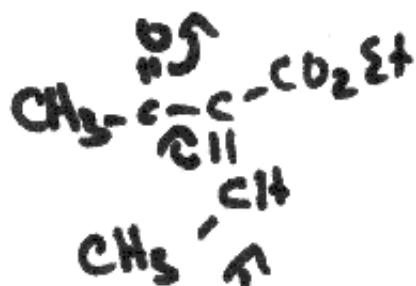
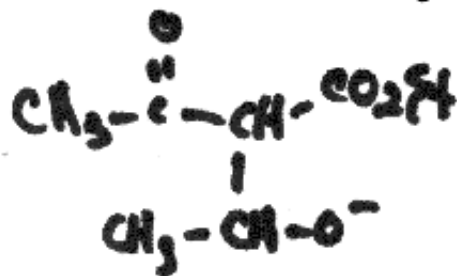
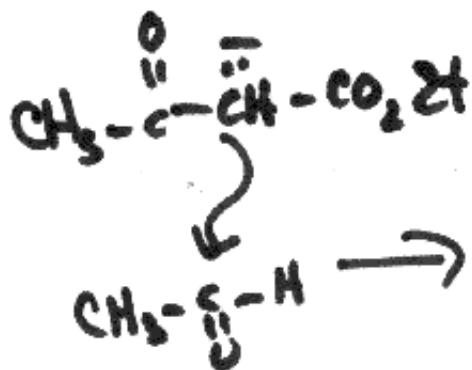
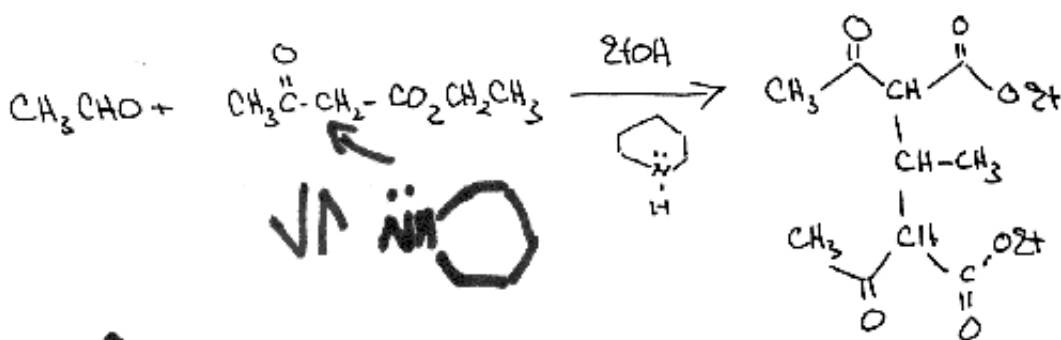
2. (10 points) Treatment of ketone 1 with LDA in dimethylformamide (DMF) solvent, followed by  $\text{CH}_3\text{I}$  addition leads to two methylated ketones. Show a mechanism for the reaction that explains why one product is favored over the other.



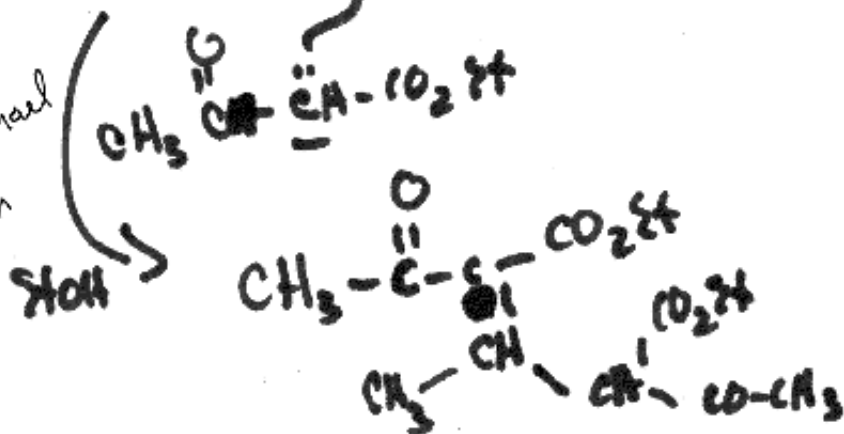
LDA is very hindered base.  
 $\text{Li}^+ \text{:N}^-$  (with three methyl groups)



3. (10 points) Write a mechanism for the following reaction.

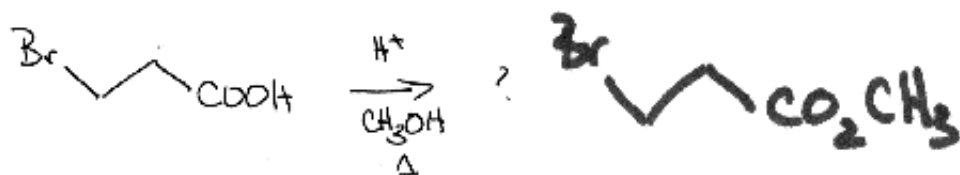


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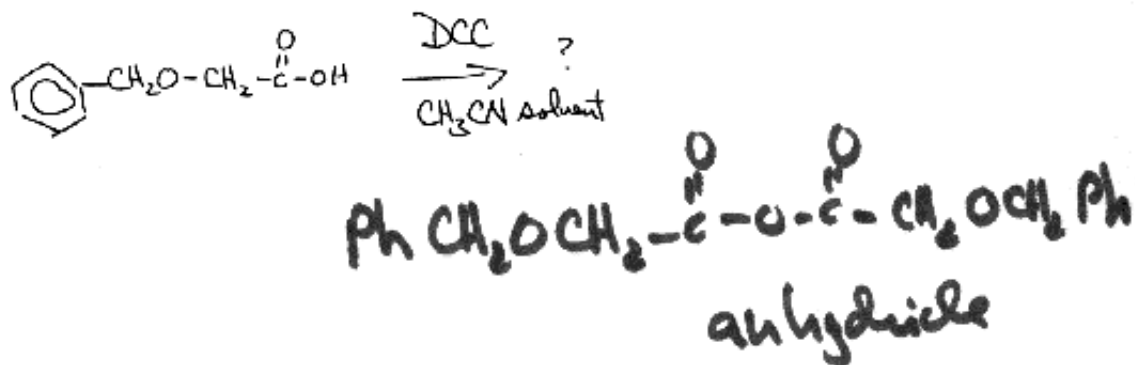


4. (20 points) What are the major organic products of the following reactions?

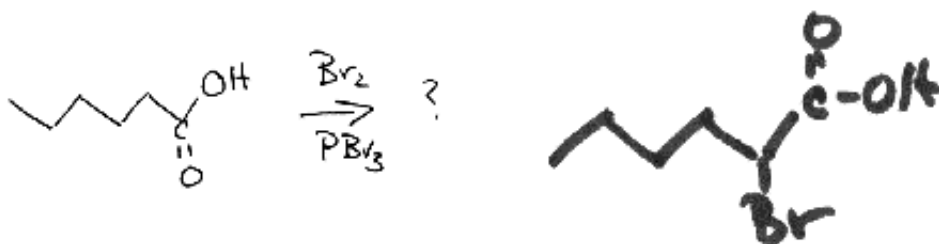
a)



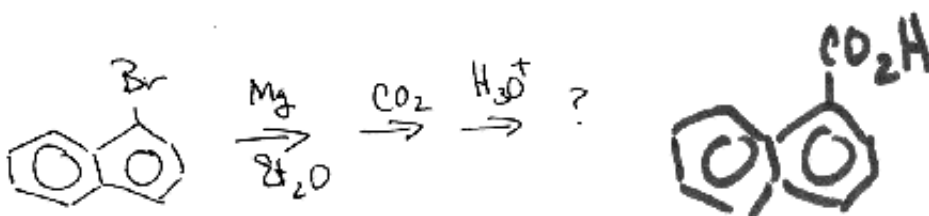
b)



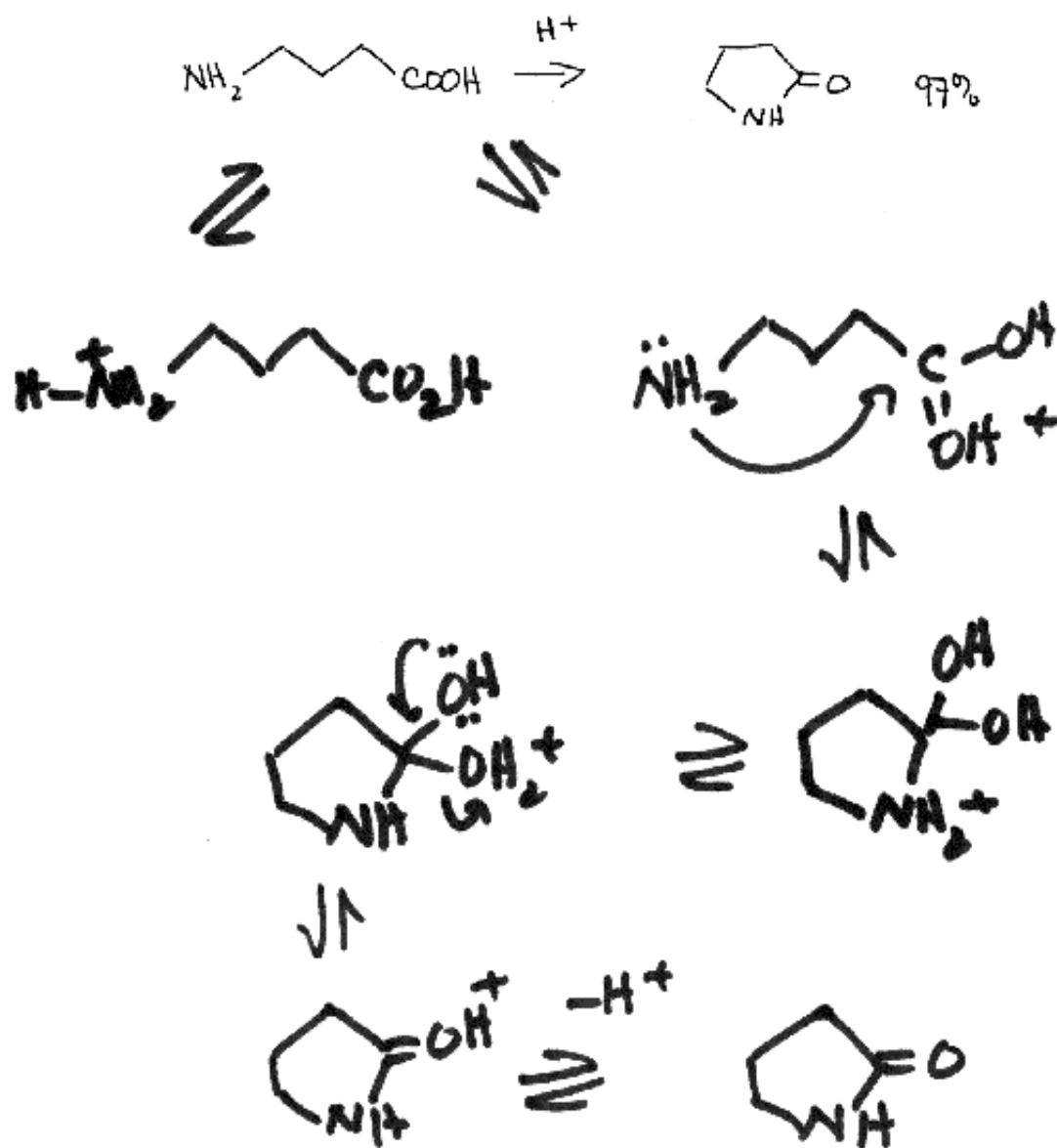
c)



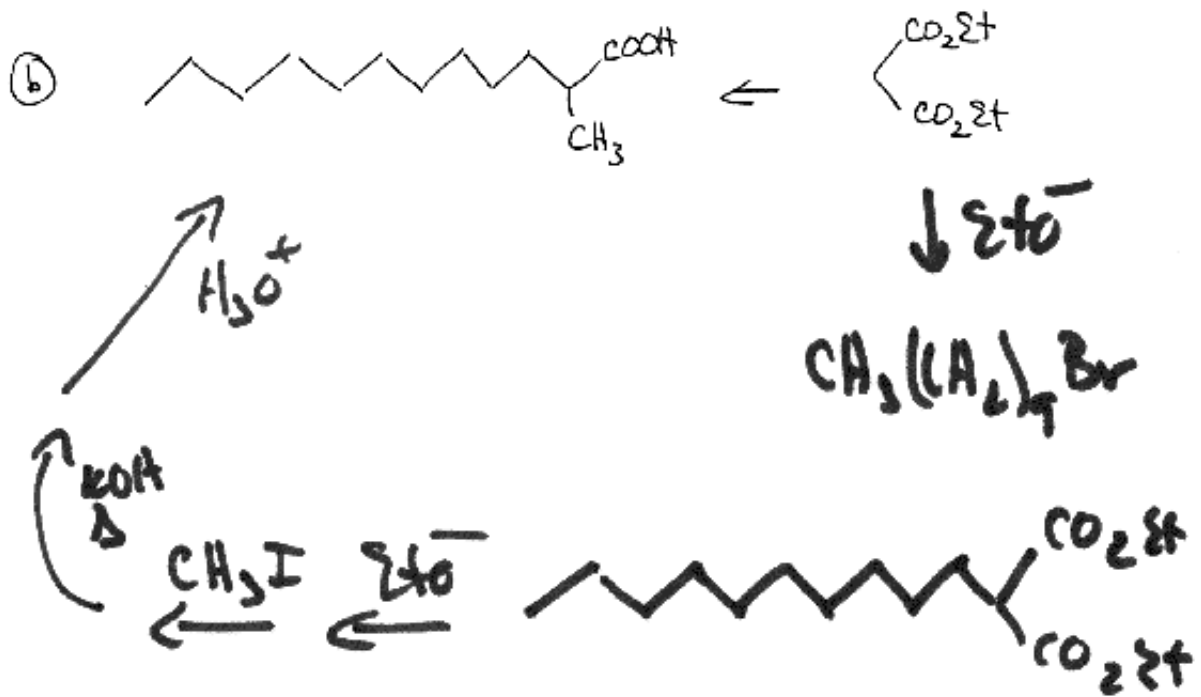
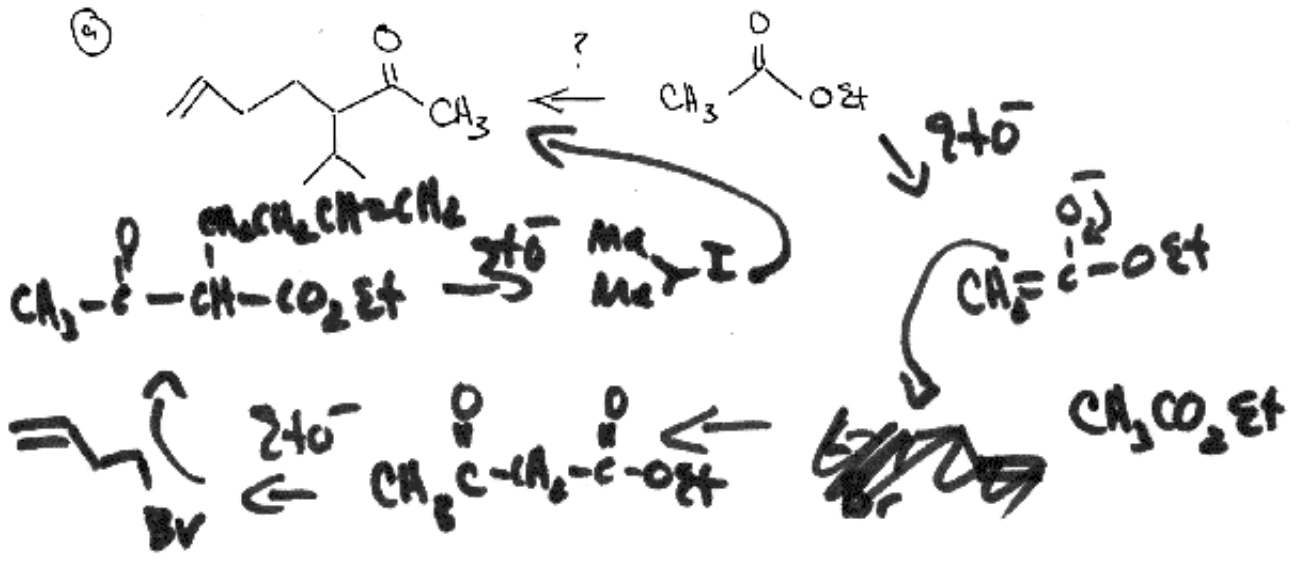
d)



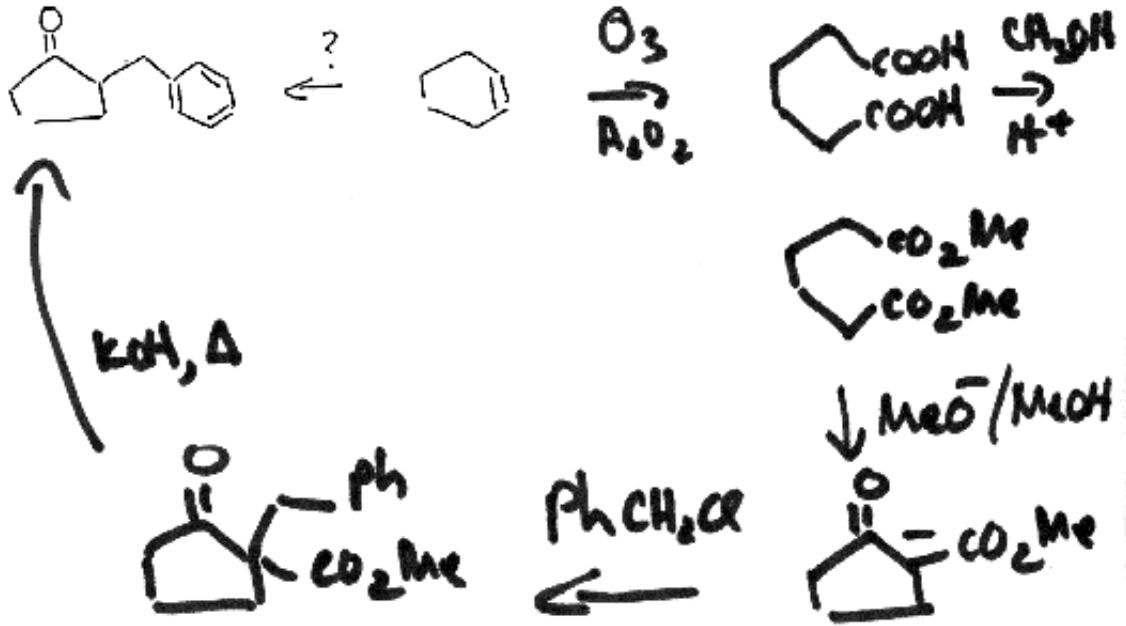
5. (10 points) What is the mechanism for lactam formation?



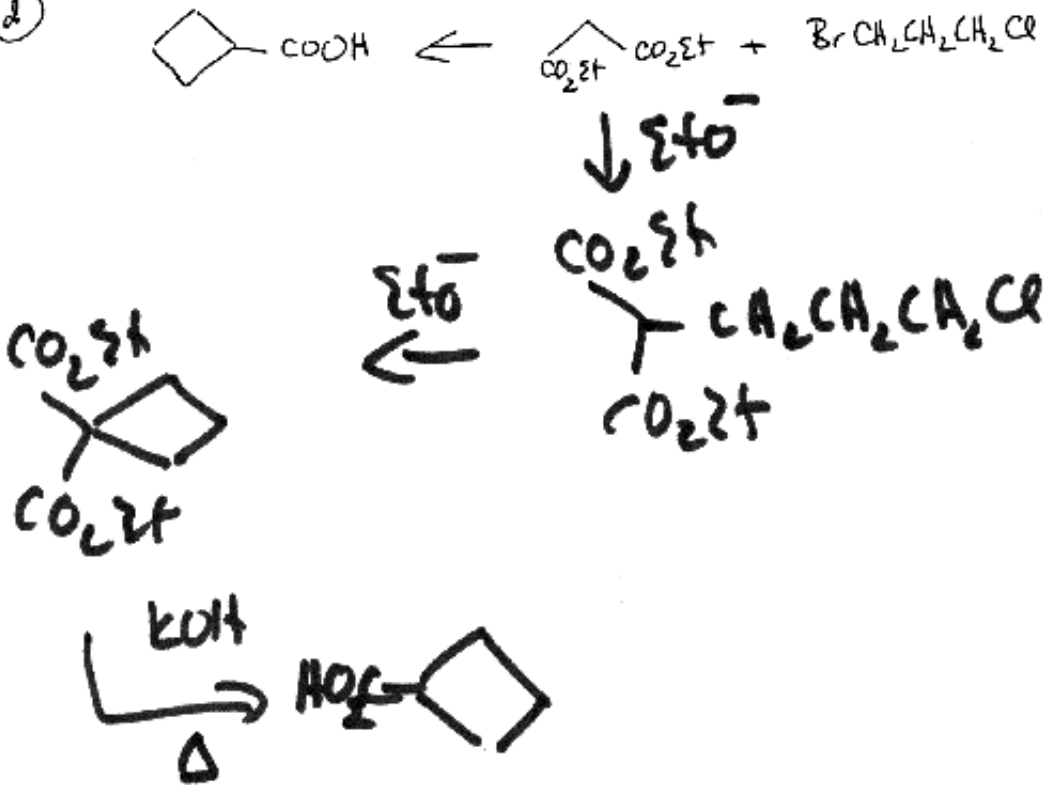
6. (20 points) Provide simple synthetic routes to prepare the targets from the indicated starting materials.



①



②





7. (10 points) What is the mechanism for the following reaction?

