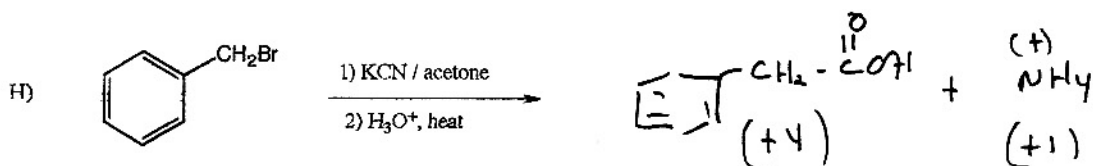
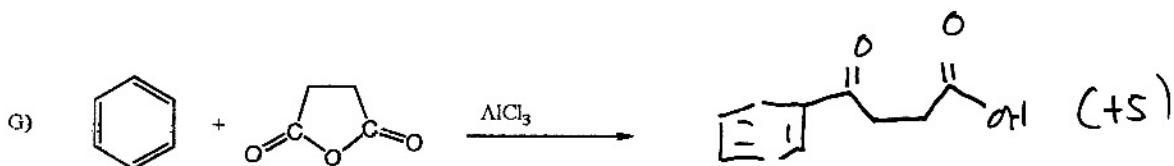
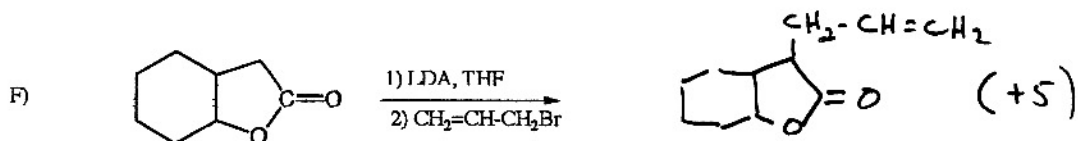
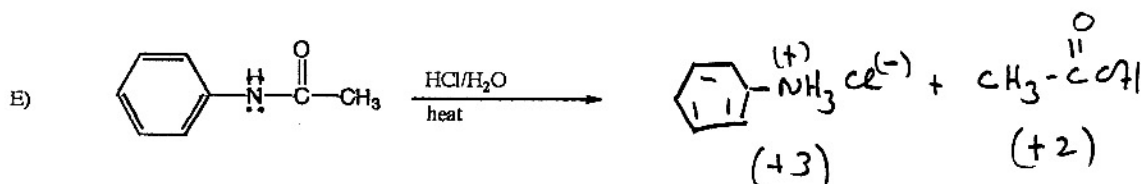
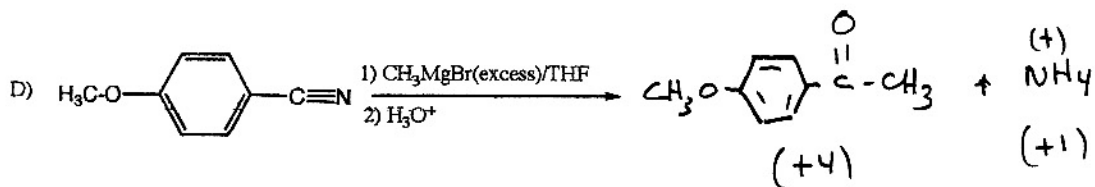
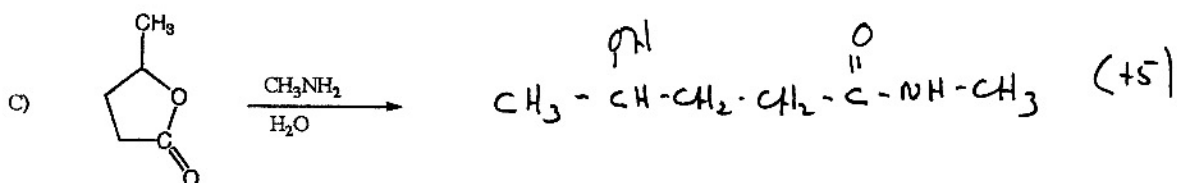
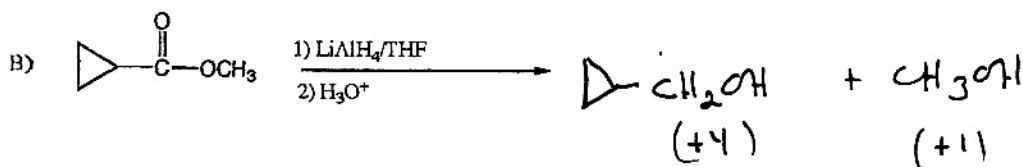
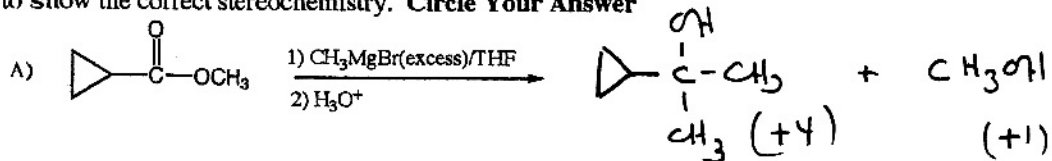
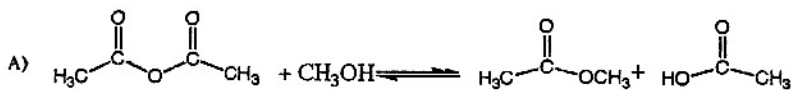


**Problem 1. (40 points)** Give the final products for the following reactions. If no reaction occurs, state so. Be sure to show the correct stereochemistry. **Circle Your Answer**



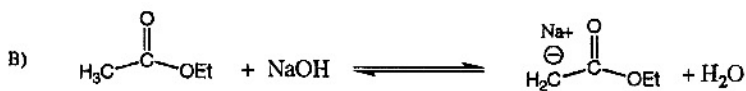
**Problem 2 (20 points)** For the following reactions determine if the equilibrium lies to the left or to the right as drawn, and circle the appropriate answer.

**Circle Answer**



LEFT

RIGHT



LEFT

RIGHT



LEFT

RIGHT



LEFT

RIGHT



LEFT

RIGHT



LEFT

RIGHT



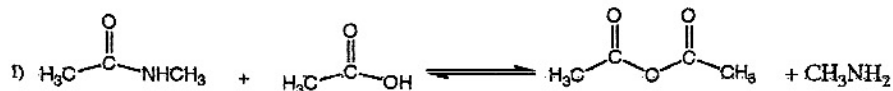
LEFT

RIGHT



LEFT

RIGHT



LEFT

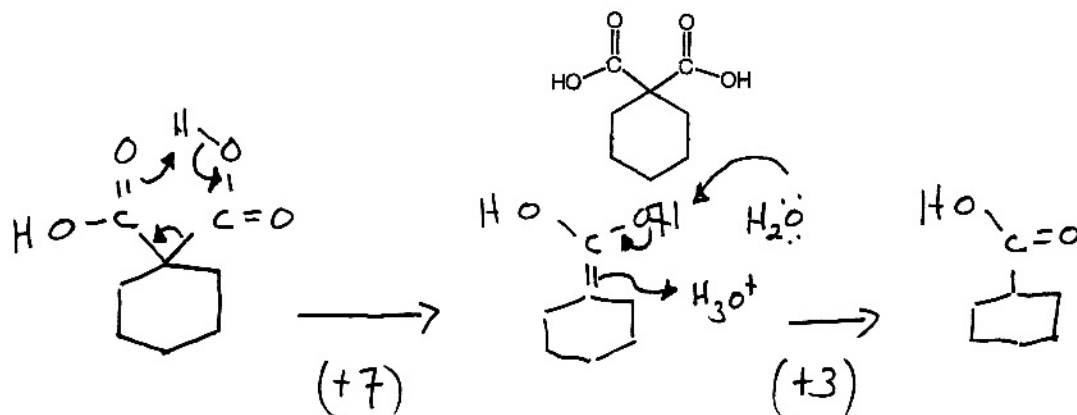
RIGHT



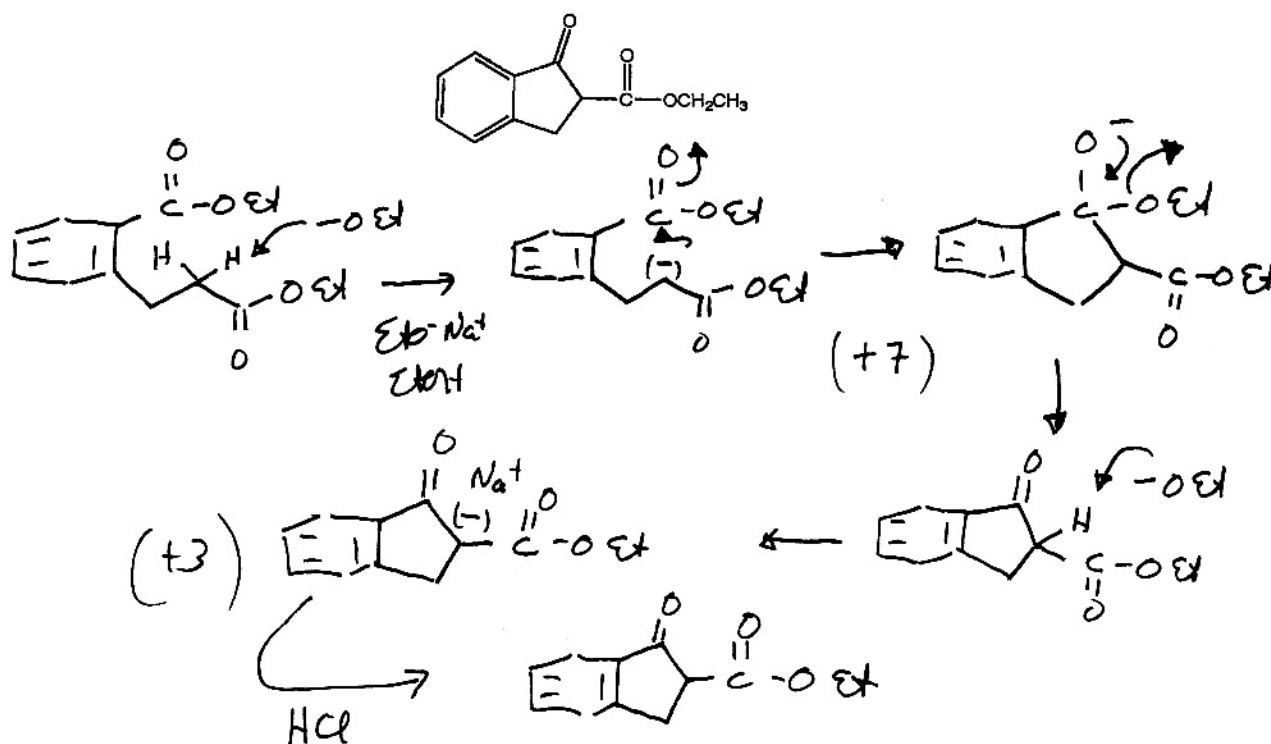
LEFT

RIGHT

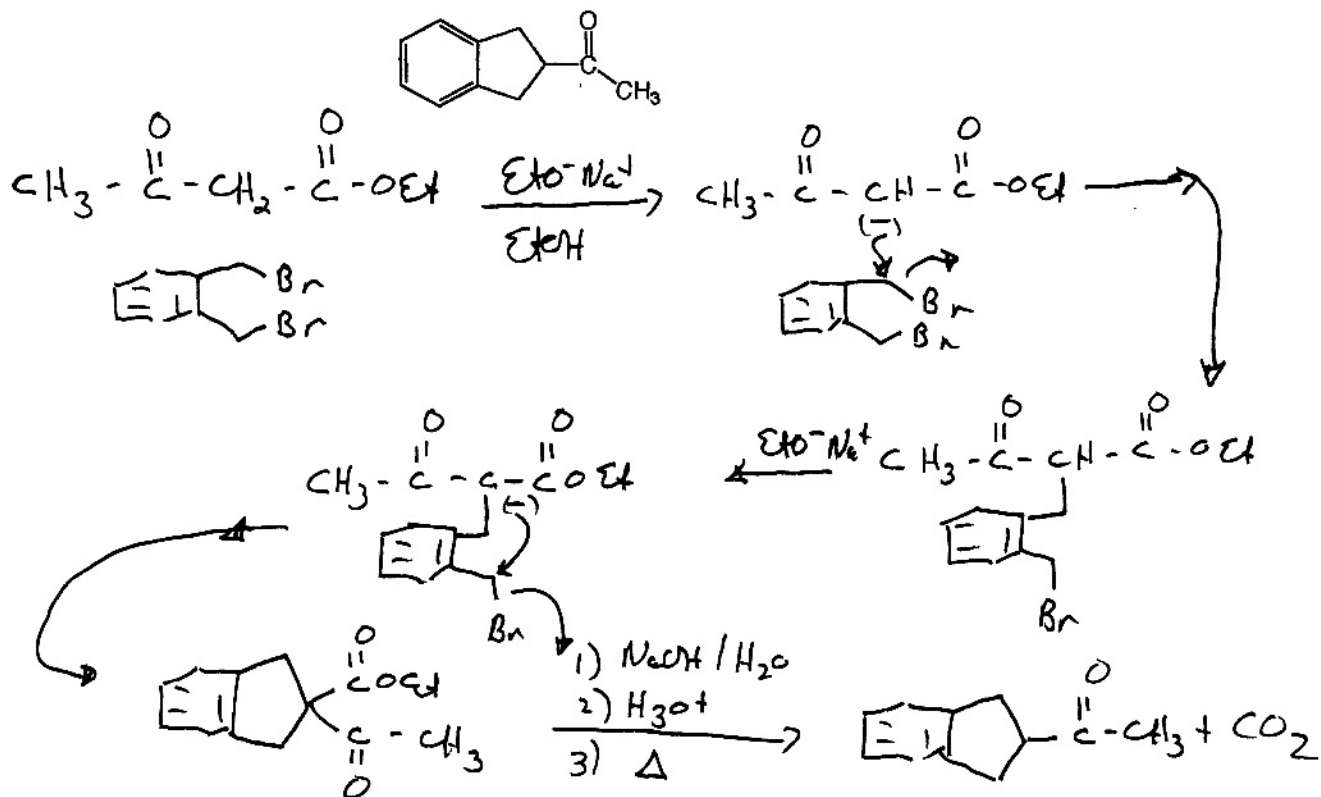
**Problem 3 (10 points)** For the following molecule, what final products are formed as a result of decarboxylation upon heating? Given the mechanism for the reactions.



**Problem 4 (10 points)** Employing Dieckmann cyclization, what starting material would you use to synthesize the following compound? Show the reaction path.



**Problem 5. (10 points)** Starting with ethyl acetoacetate and any other organic compounds, how would you synthesize the following compound using the acetoacetic ester synthesis? Show the reaction pathway.



**Problem 6. (10 points)** How would you carry out the following transformation?

