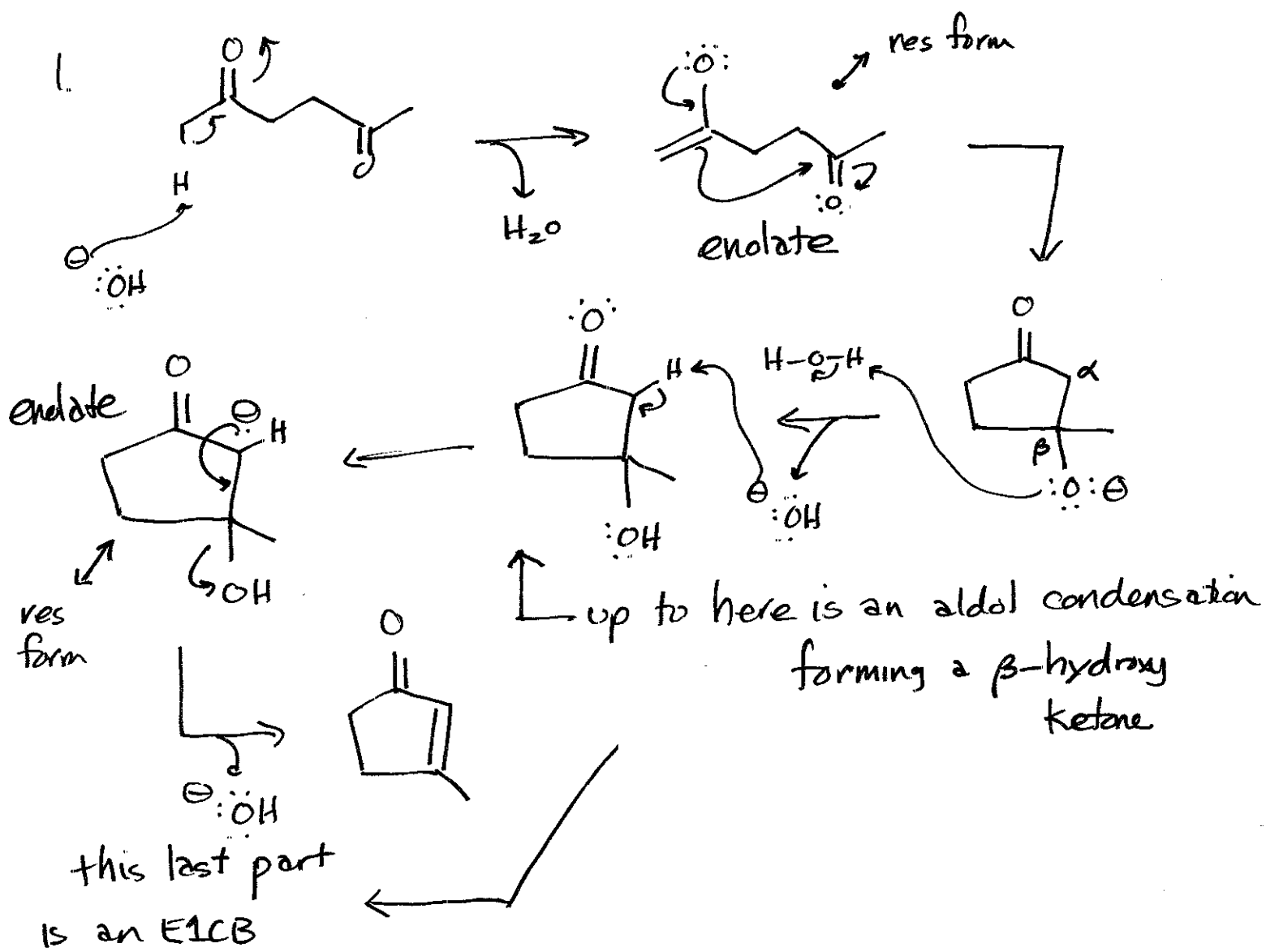
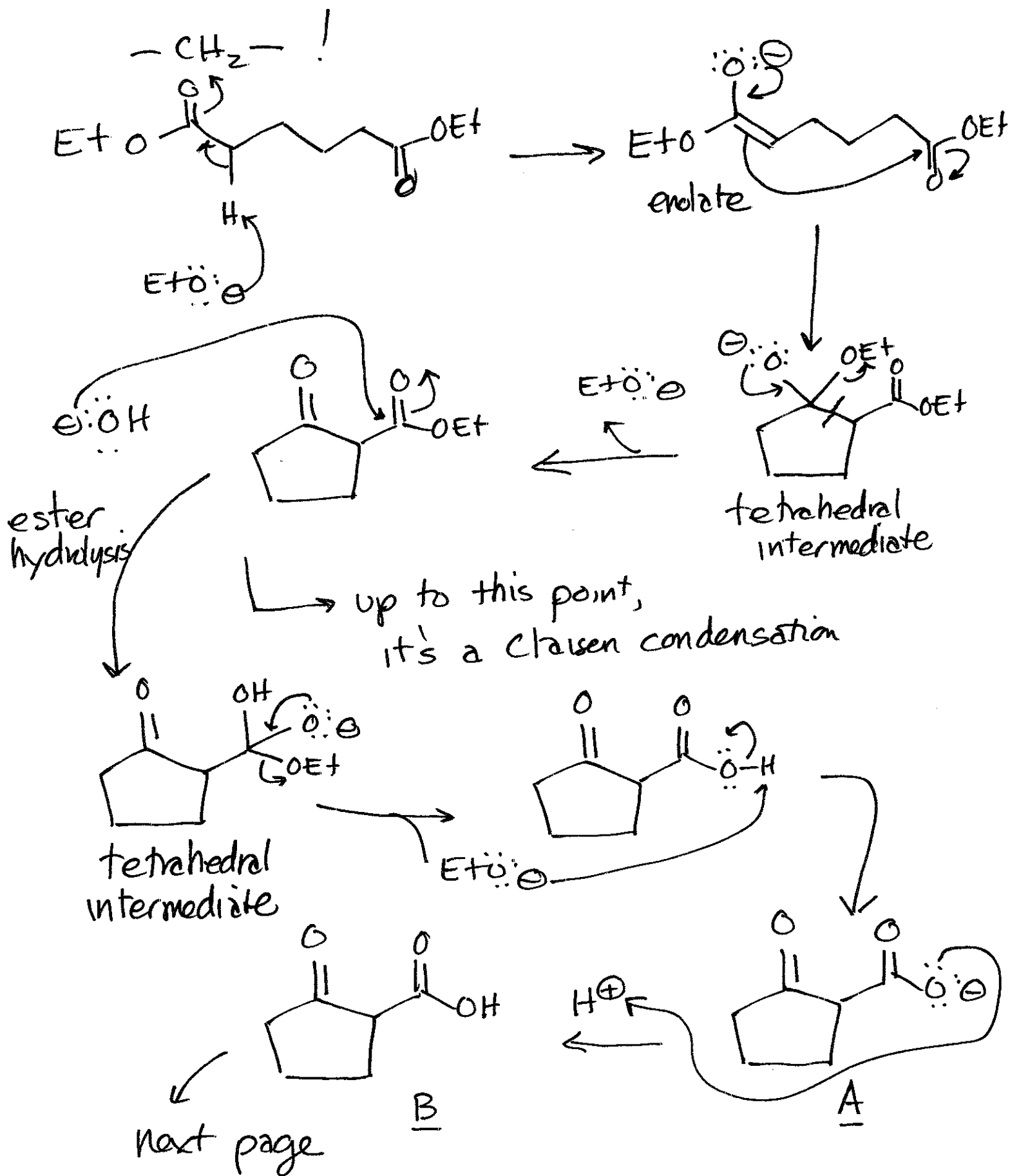


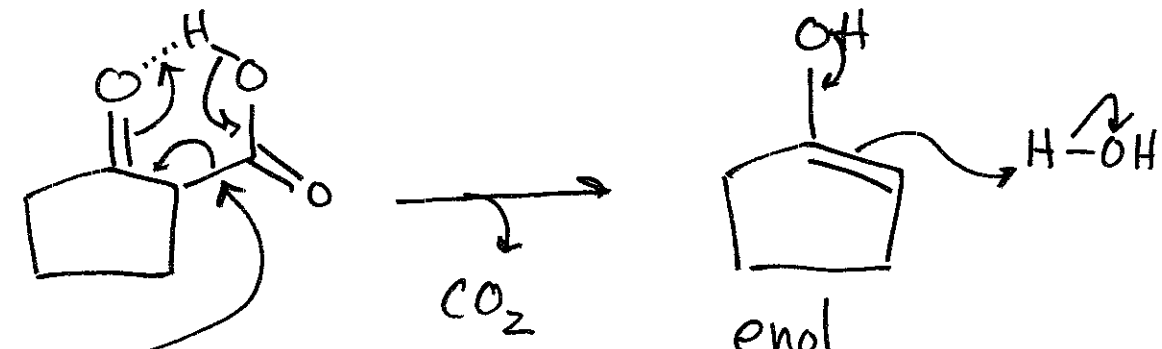
Study Question #7 Key



#2 Corrected starting material has one more



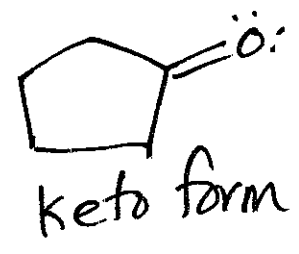
B



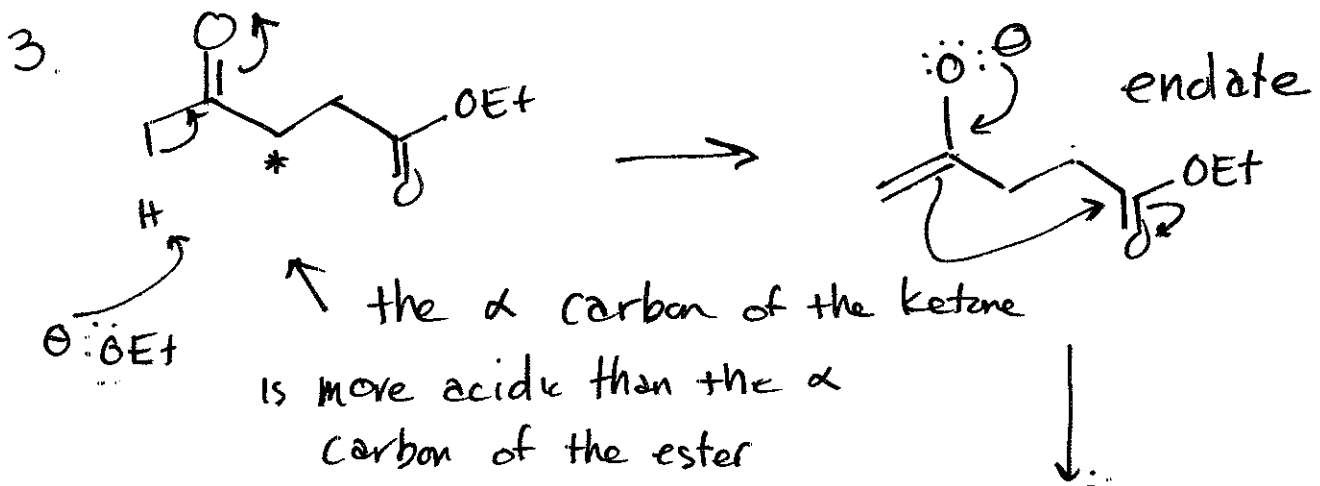
this bond breaks

this is decarboxylation of a β -keto acid

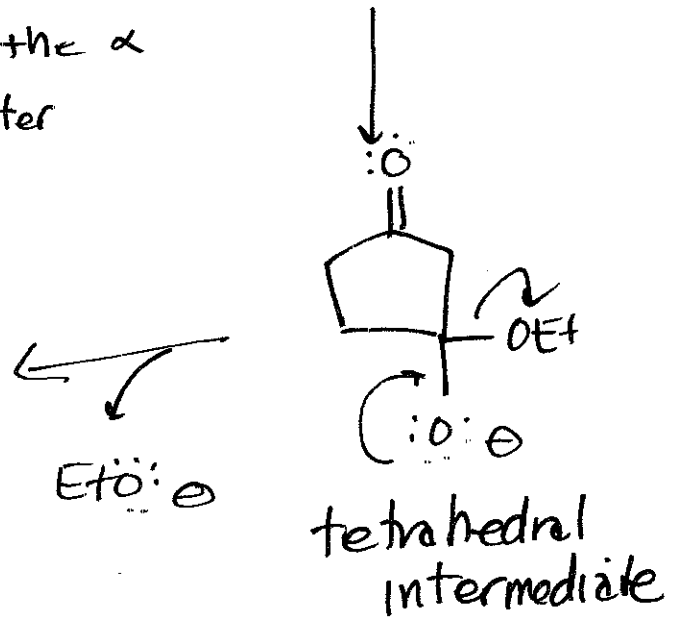
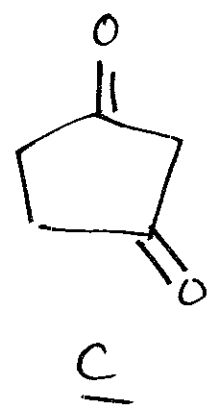
enol form



keto form



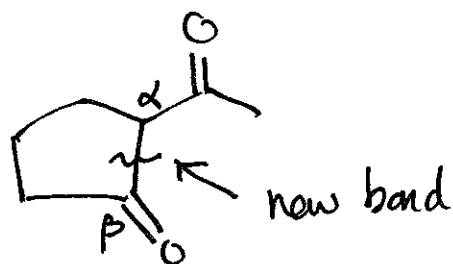
* this position is also acidic, but would lead to an unfavorable 3-membered ring when it attacked the ester $C=O$



4. Same mechanism as for #3, except that 2 different rings can be formed...

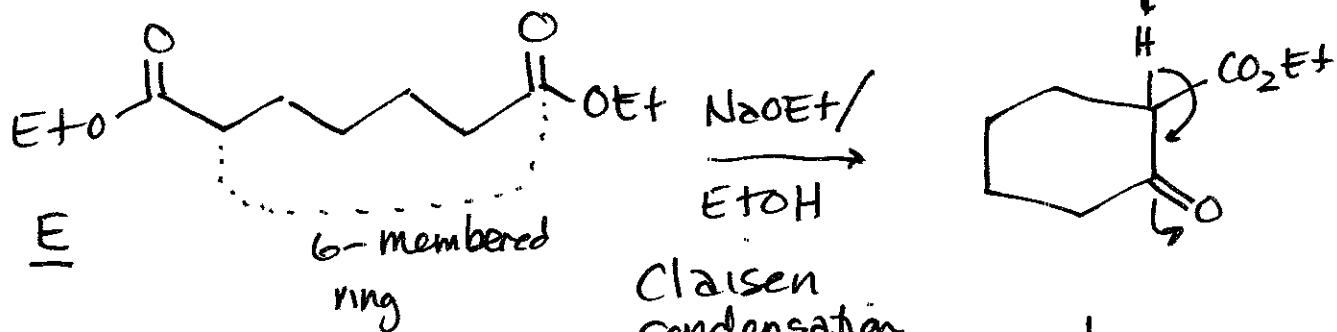


the 5-membered ring is preferred (7-membered rings aren't readily formed)



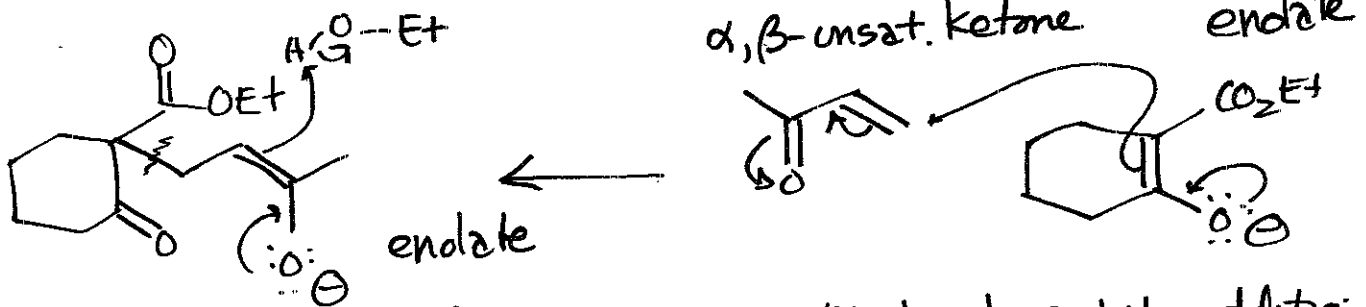
5. The 1st step here is analogous to the corrected question #2, except that one more

-CH₂- is needed, so E must be ...

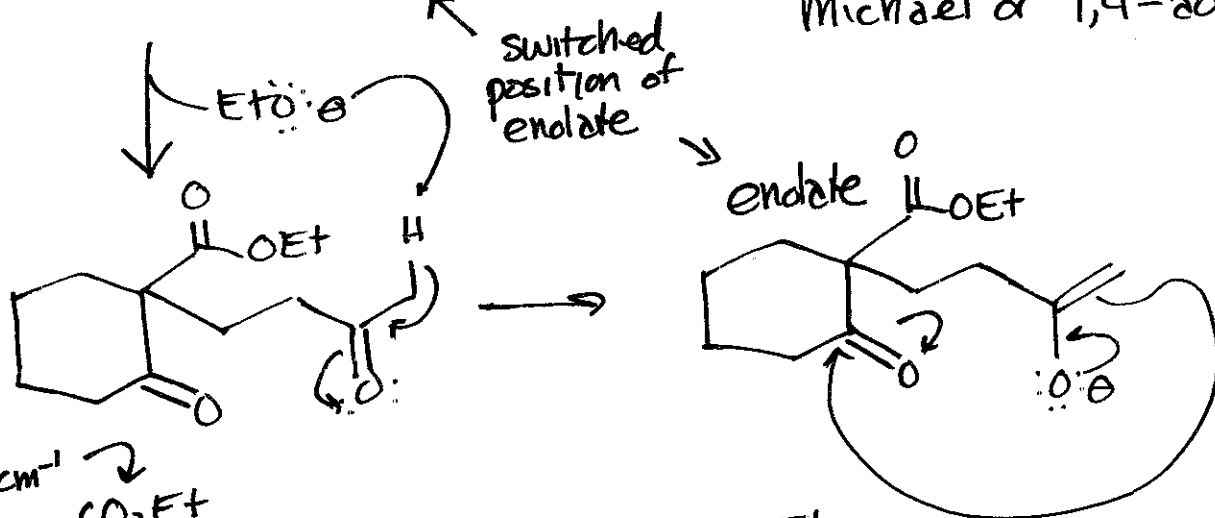


Claisen condensation
(see Q# 2 for details)

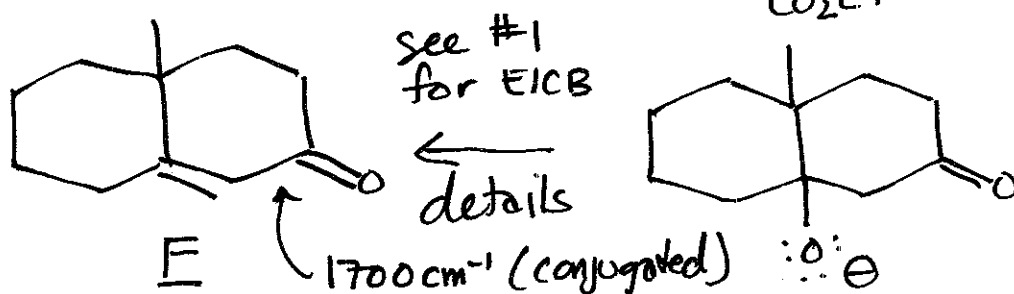
α, β -unsat. ketone enolate



Michael or 1,4-addition



1740 cm⁻¹ \rightarrow CO₂Et



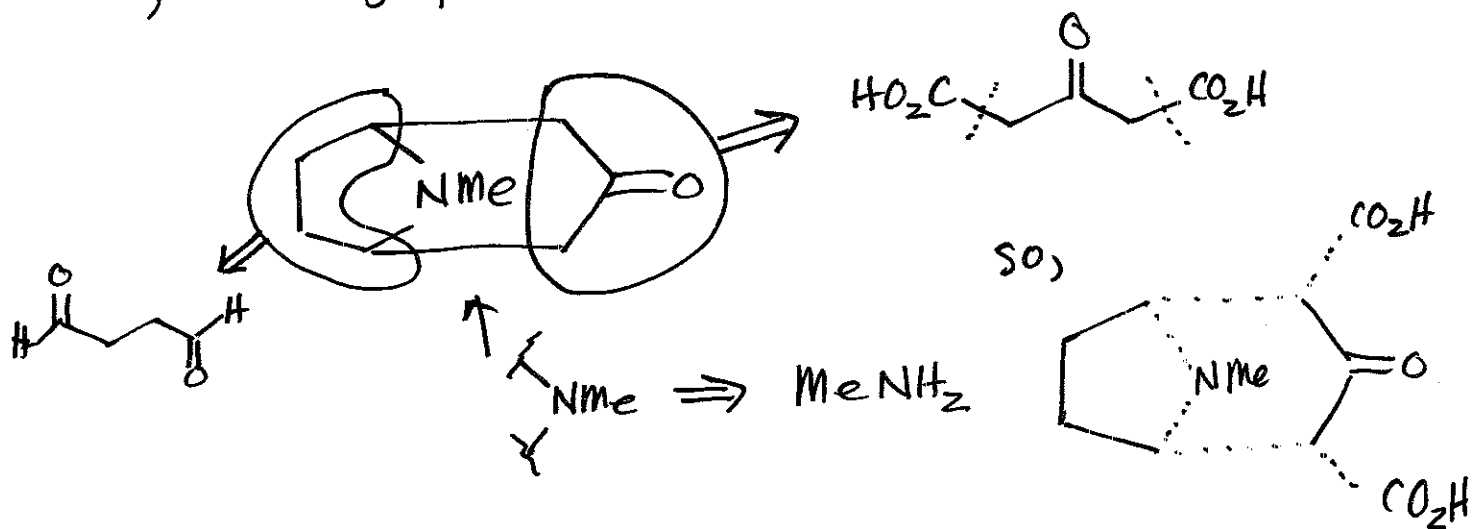
see #1 for EICB

details

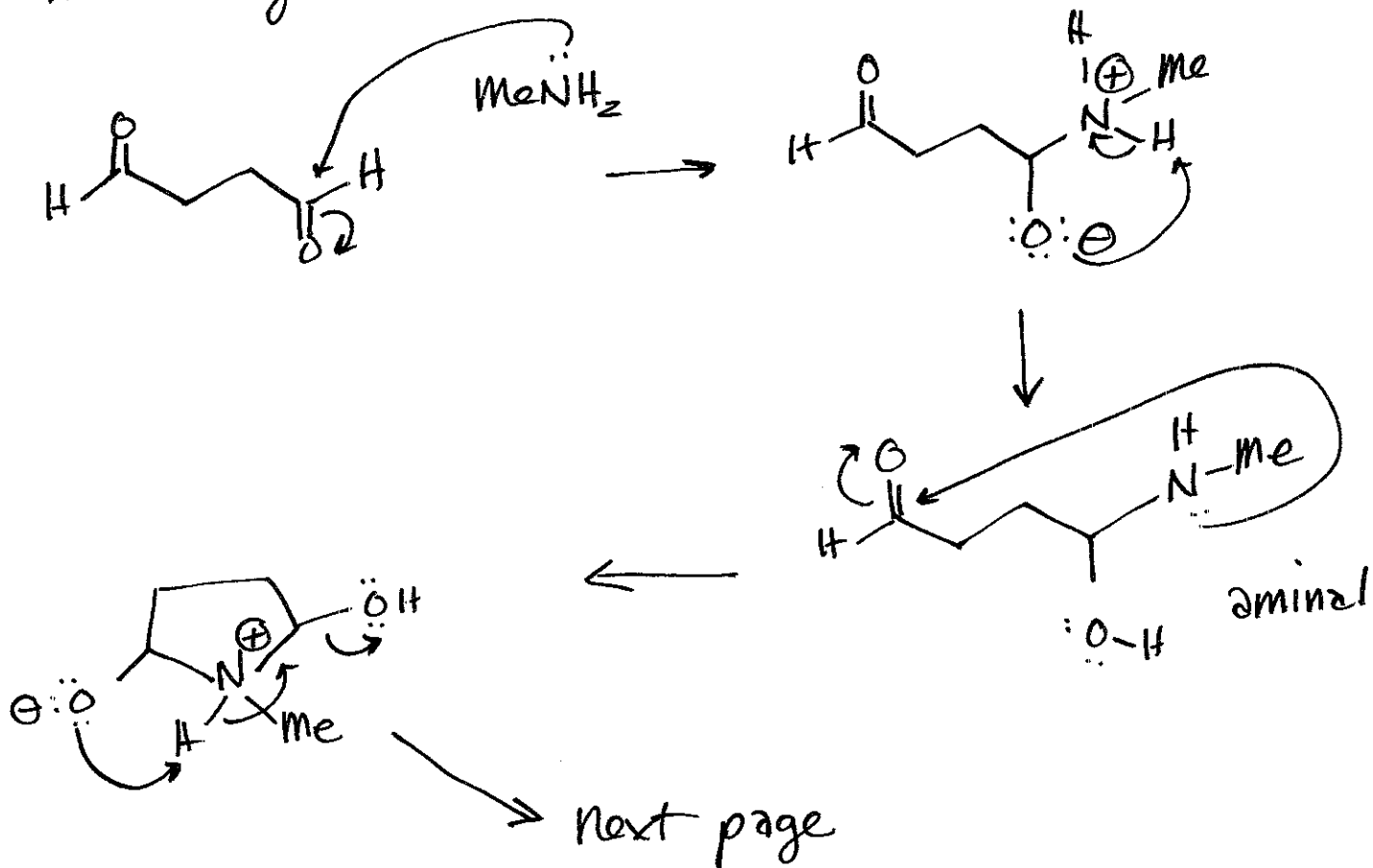
E 1700 cm⁻¹ (conjugated)

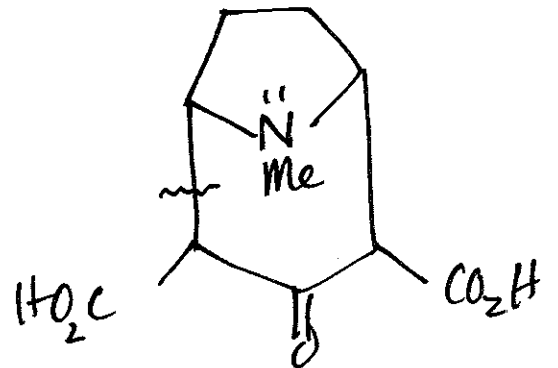
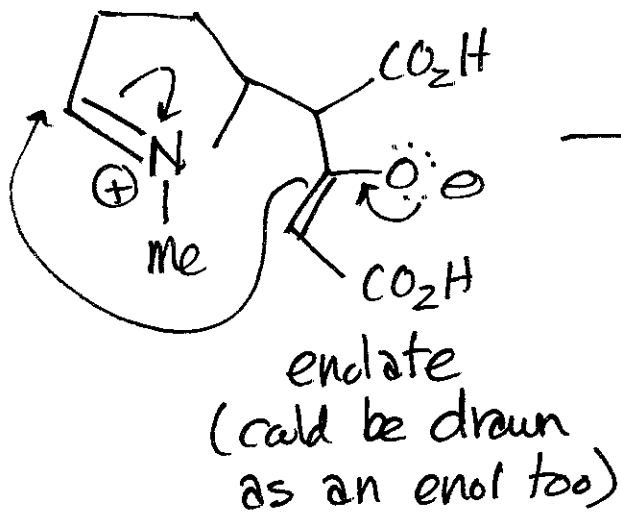
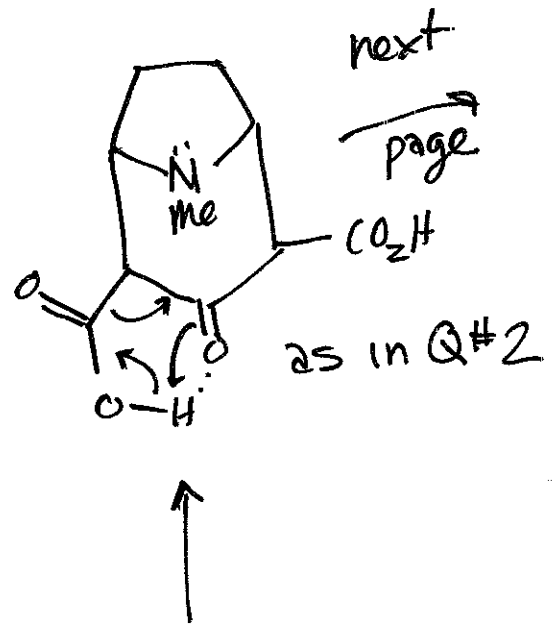
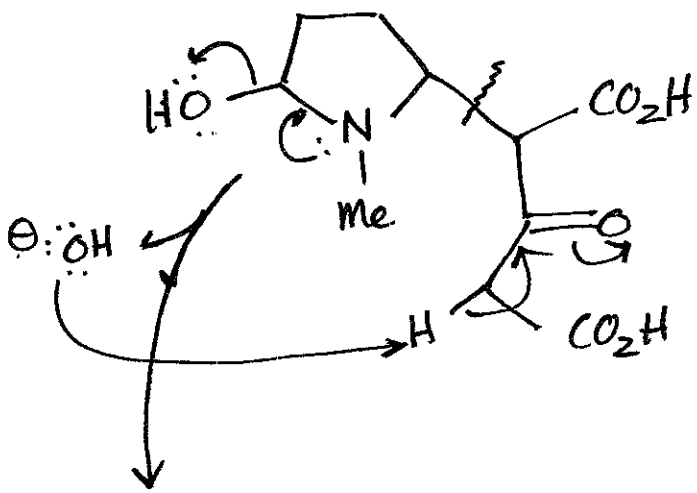
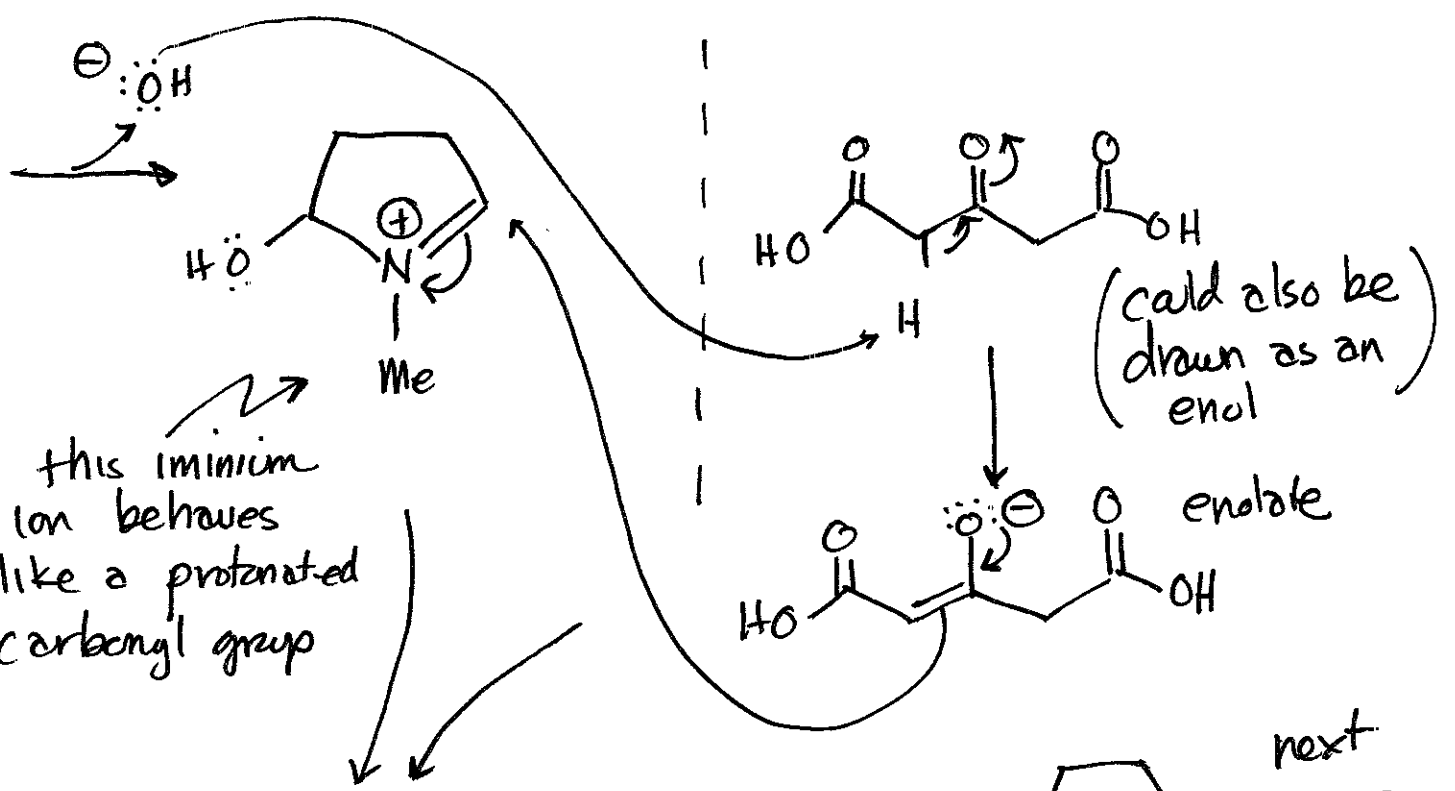
#6. The order of some of these steps can be interchanged.

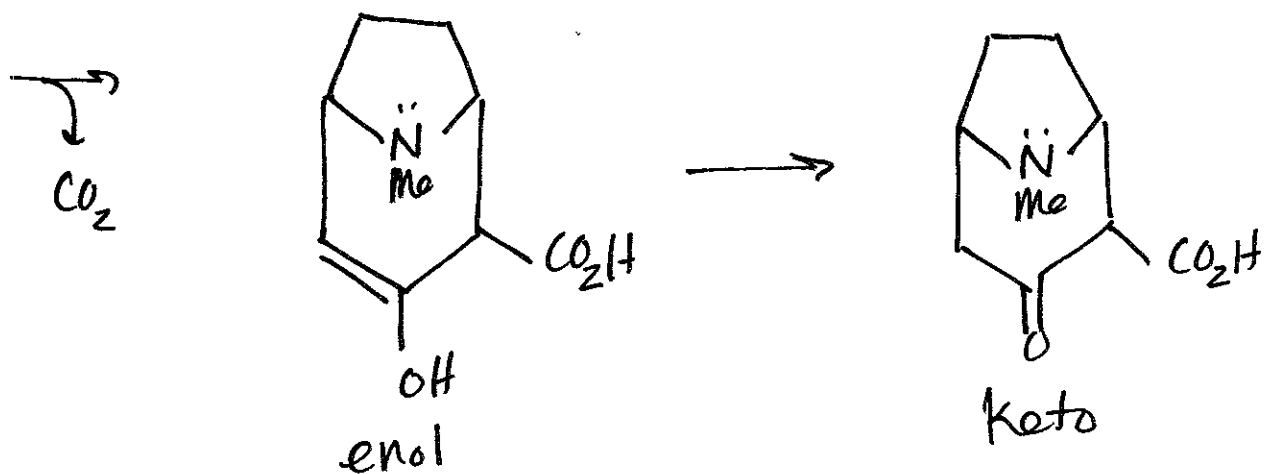
1st, the big picture



Here we go...







the decarboxylation of a β -keto acid occurs 2x here - you also saw it in question #2

↓ now repeat the decarboxylation

tryptophan