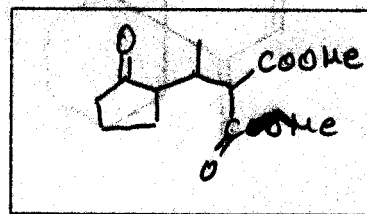
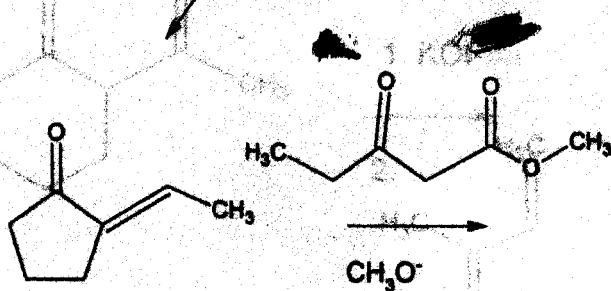
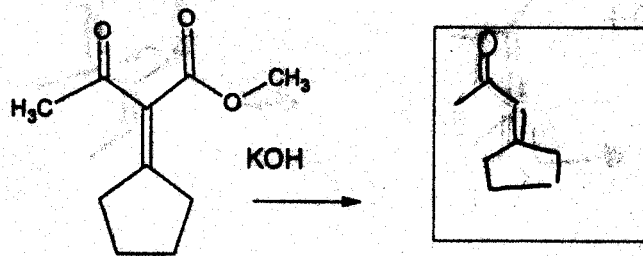
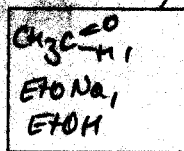
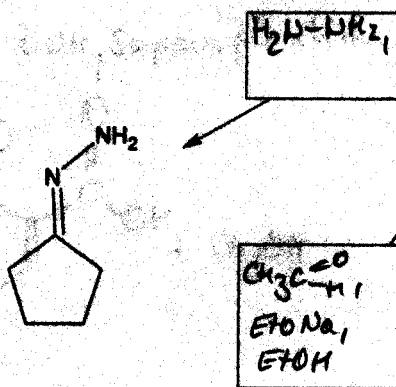
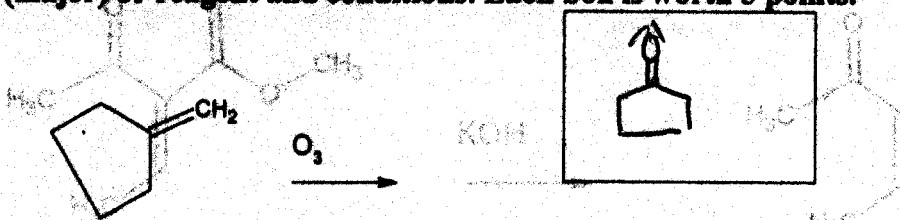
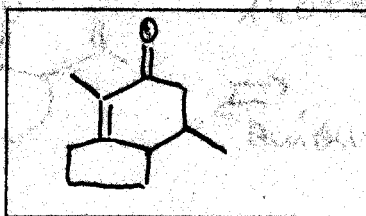


2. Suggest a reasonable mechanism for each of the following reactions. (5 marks each)

1. Complete the following reactions Fill in the boxes with the appropriate compound (major) or reagent and conditions. Each box is worth 5 points.



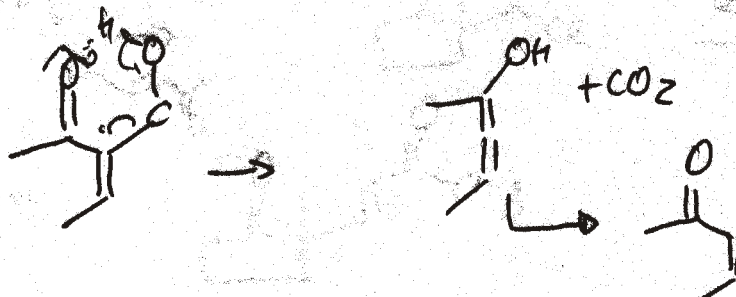
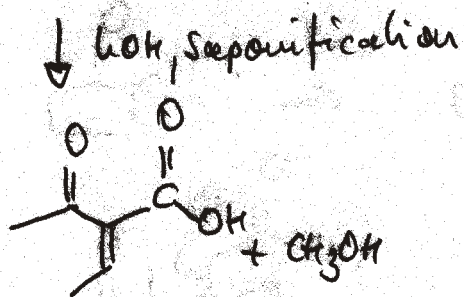
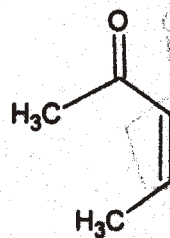
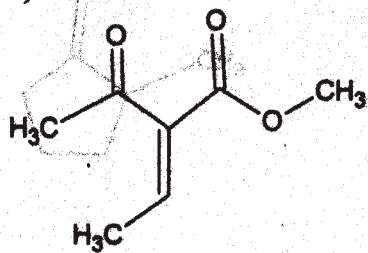
1. KOH
2. heat
3. NaNH<sub>2</sub>



Hint: one step is decarboxylation

2. Suggest a reasonable mechanism for each of the following reactions. (5 points each):

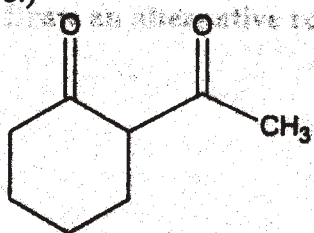
a)



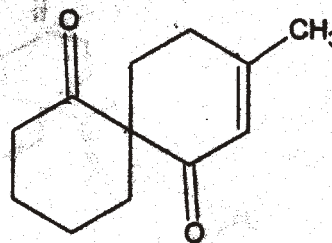
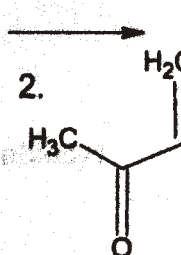
Extra points (5 points each):

b.)

Suggest an alternative reaction reagent for question b)

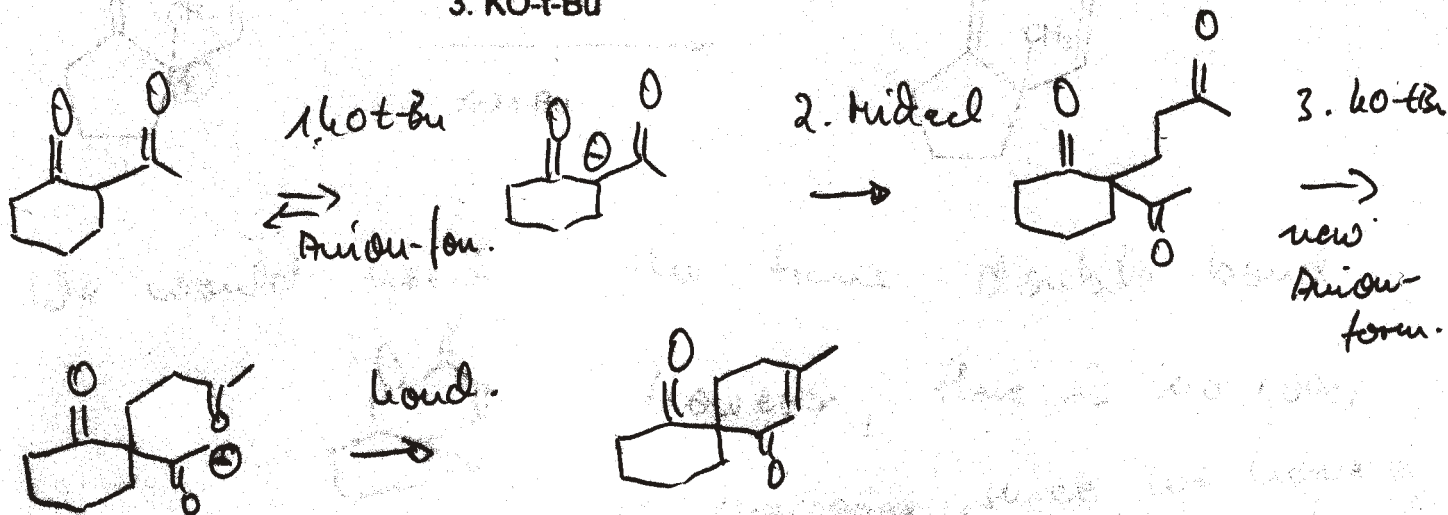


1. KOt-Bu

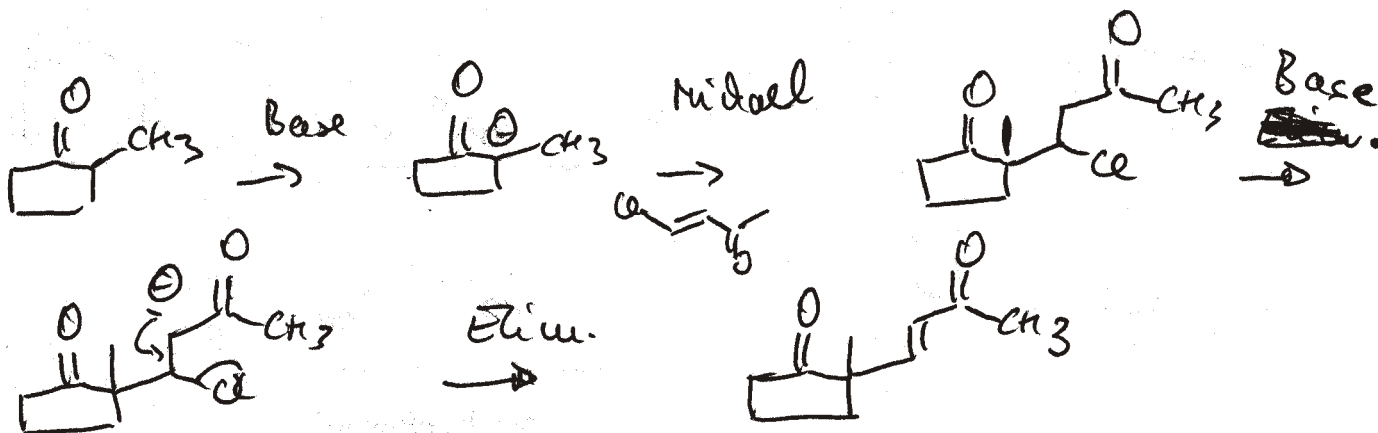
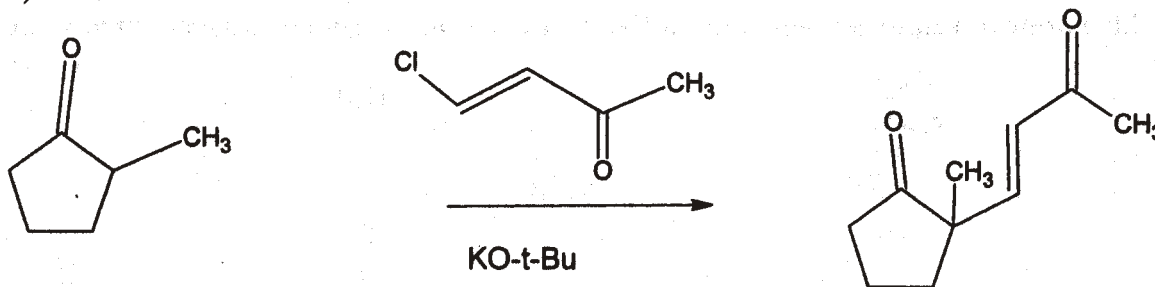


Why the following step is important:

3. KO-t-Bu

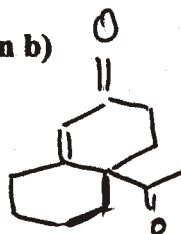


c.)

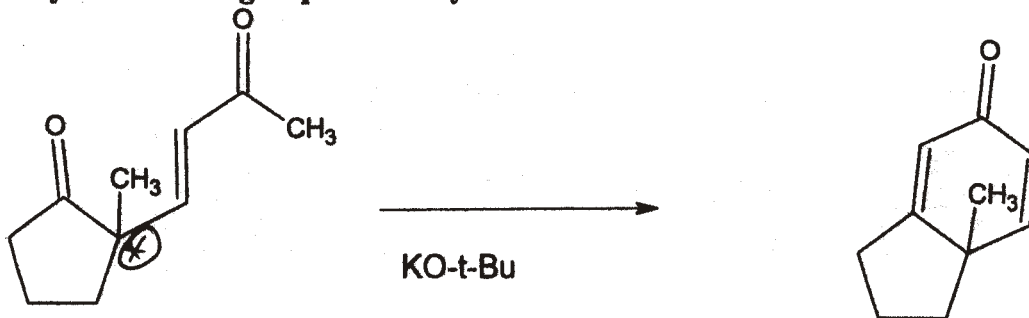


Extra points (5 points each):

Draw an alternative reaction product for question b)

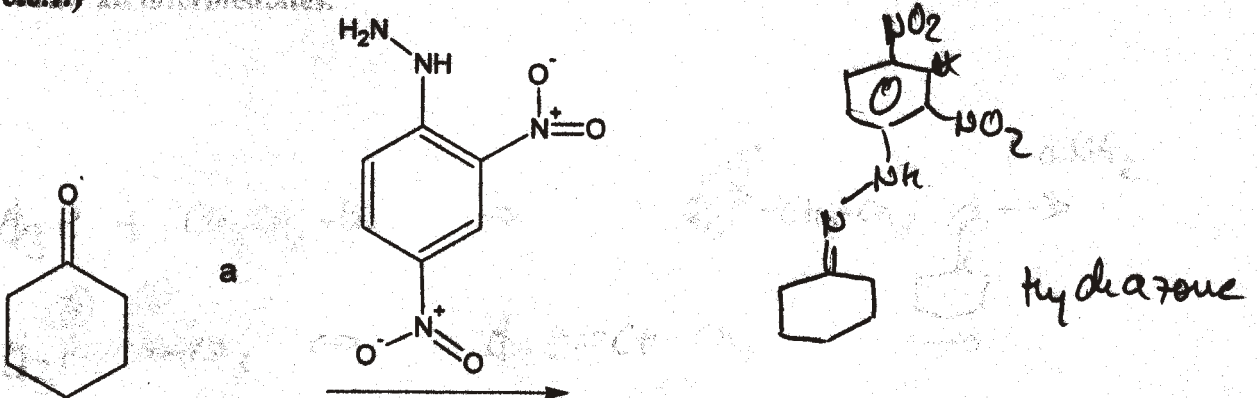


Why the following step is unlikely?

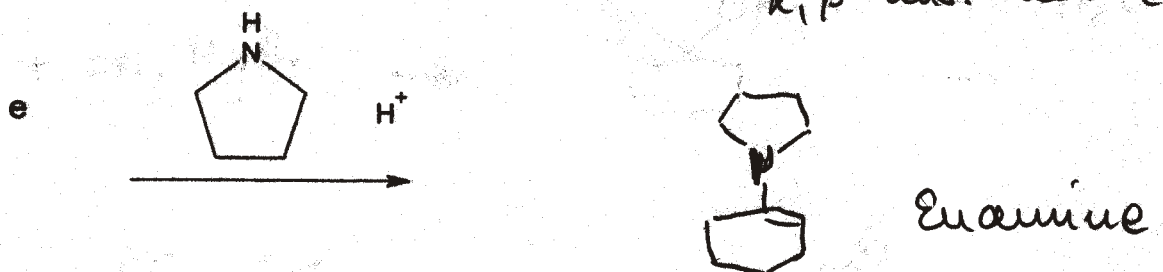
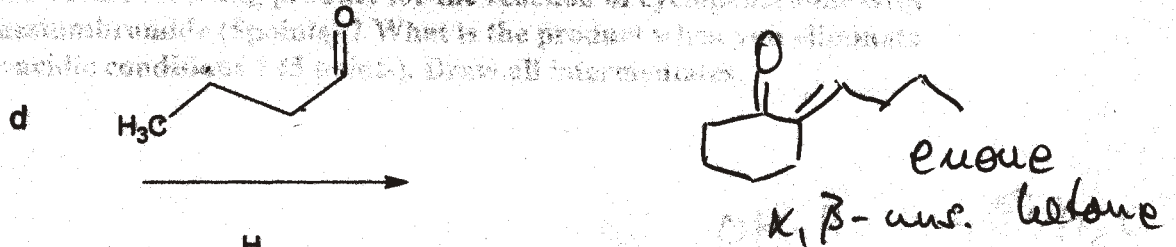


We would need the trans double bond however, there is no way to isomerize, since we have a quaternary center at  $\alpha$

3. Complete the following transformations (4 points each). Each transformation starts with cyclohexanone. Name also the resulting functional groups (alcohol, acid etc...) all intermediates.



3. What would be the resulting product for the reaction of cyclohexanone with ethylmagnesium bromide (structure)? What is the product when you eliminate water under acidic conditions? (4 points). Draw all intermediates.







6. Show the aldol condensation products for each of the following compounds (4 points each). Provide proper reaction conditions

