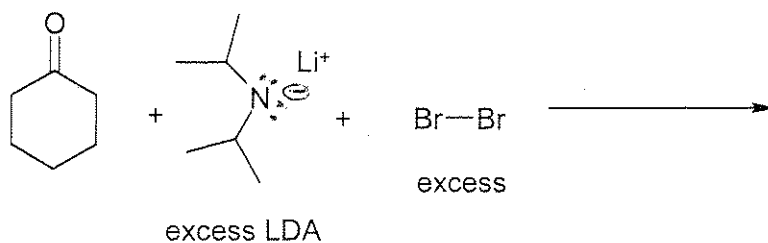


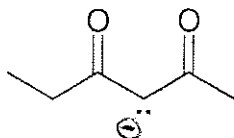
1. (8 pts) For the following reaction:



- Draw the structure of the  $C_6H_6Br_4O$  product.
- Used curved arrows to show the mechanism for the **first** bromine substitution in this reaction. (For full credit, you must draw all important resonance structures of the intermediate).

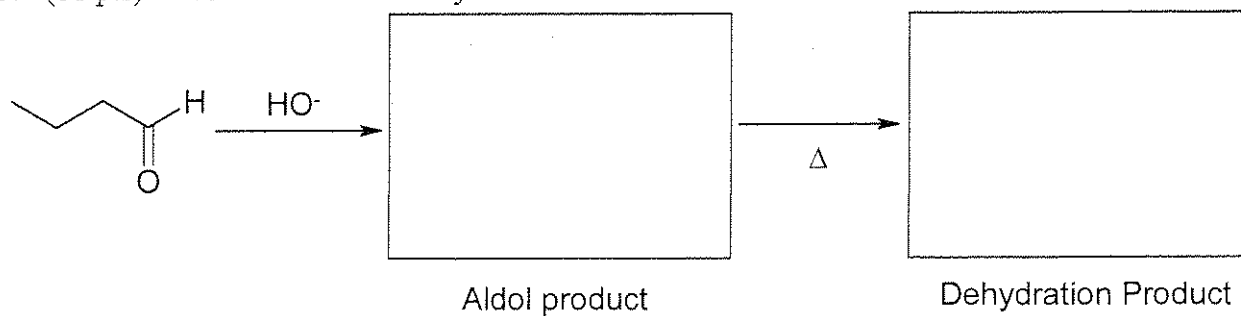
c) Is LDA acting as a catalyst in this reaction? Yes or No

2. (6 pts) For the following anion:



- Draw a methyl ester and ketone that, when mixed with an appropriate base, would yield the product above in a Claisen-type reaction.
- Draw a different methyl ester and different ketone that, when mixed with an appropriate base, would also yield the product above in a Claisen-type reaction.

3. (11 pts) A solution of the aldehyde below is treated with a small amount of KOH:



- a) Draw the structures of the appropriate products in the boxes above.
- b) Show the mechanism of the formation of the aldol and dehydration product. For full credit **show all important resonance structures** of each species in your mechanism.