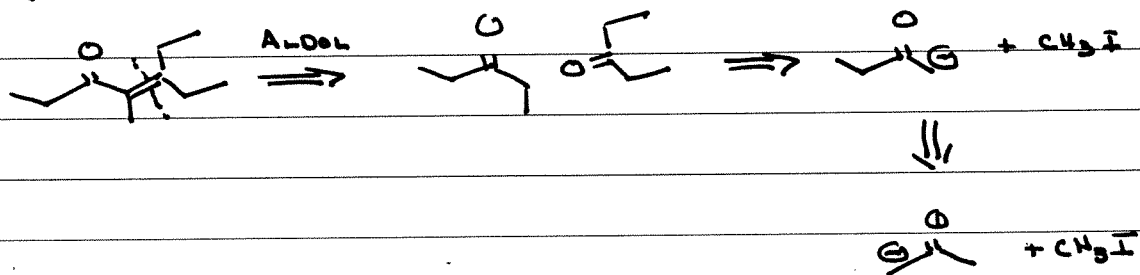
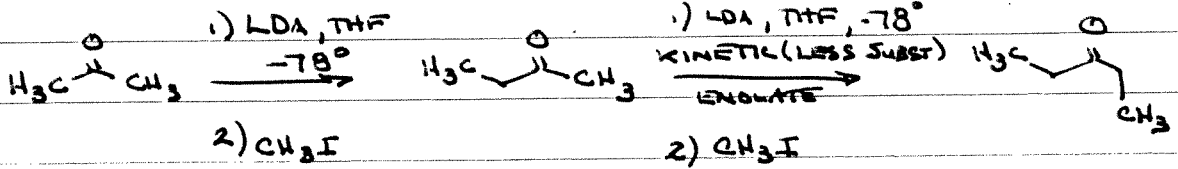


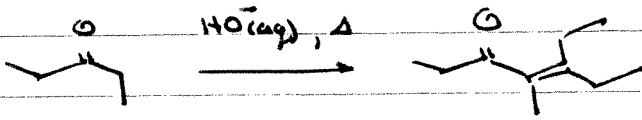
### 3a) RETROSYNTHETIC ANALYSIS



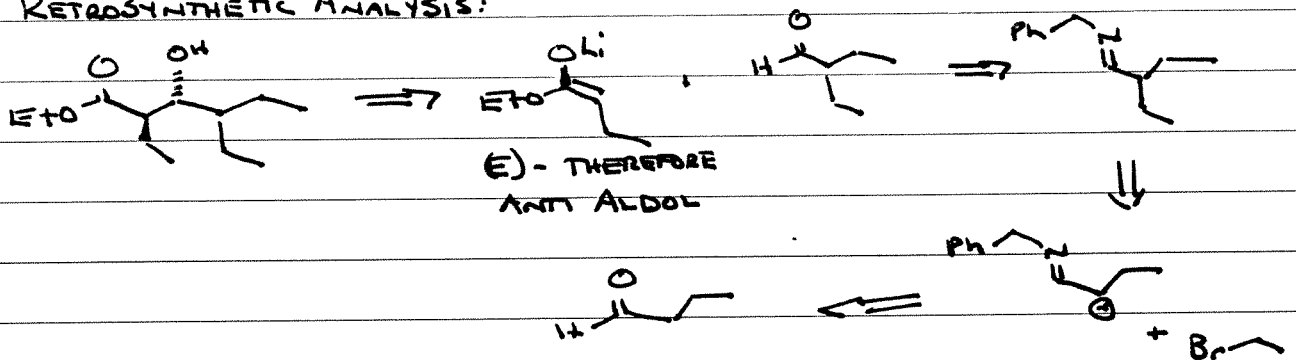
FORWARD SYNTHESIS - MANY WAYS TO ALKYLATE, BUT SIMPLEST IS:



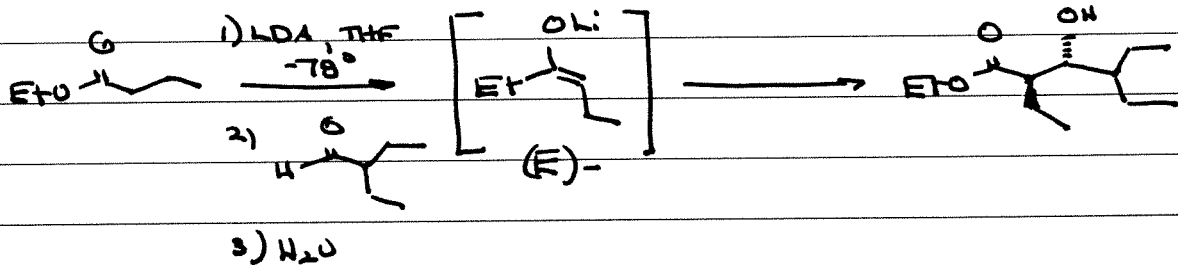
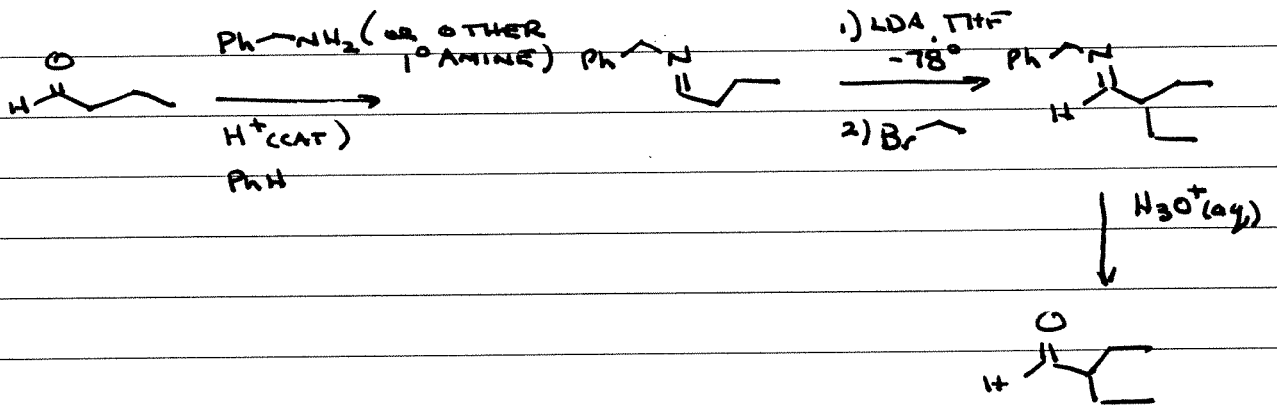
AND THEN



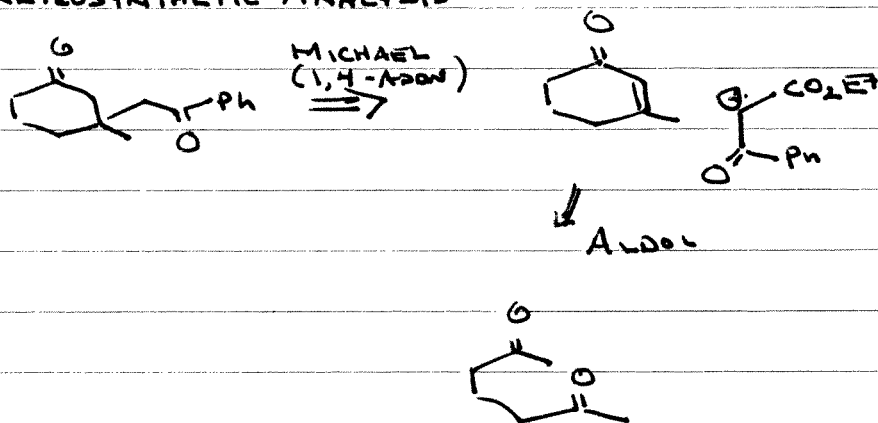
b) RETROSYNTHETIC ANALYSIS:



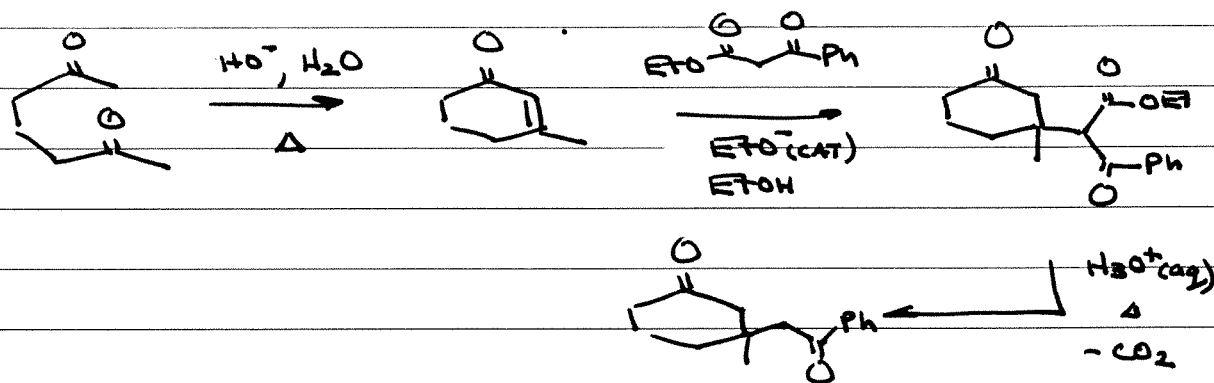
FORWARD SYNTHESIS:



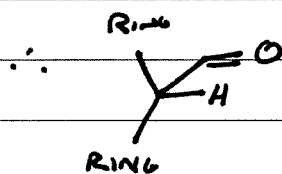
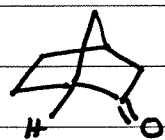
### c) RETROSYNTHETIC ANALYSIS



### FORWARD SYNTHESIS:



**BONUS:** THERE IS A C-H AT THE 'BRIDGEHEAD' CARBON NEXT TO THE KETONE, BUT IT IS ALIGNED ROUGHLY IN THE SAME PLANE AS THE C-O BOND. THEREFORE IT IS PERPENDICULAR TO THE p-ORBITALS OF THE  $\pi$  SYSTEM, AND DOESN'T OVERLAP AT ALL. AS A RESULT, IT IS NOT ACIDIC... THIS IS A GENERAL PROBLEM WITH BRIDGEHEAD p-ORBITALS /  $\pi$ -BONDS; THEY IMPOSSIBLE FOR SMALL/NORMAL RING SIZES - THIS IS OFTEN CALLED BREIT'S RULE.



WHAT YOU NEED FOR ACIDITY

