Name: _____ SID: _____

Signature: _____

PRINT YOUR NAME CLEARLY!!

Chem 3B Su10 **Midterm 1** **12JUL10**
Neil O.L. Viernes

This exam has 11 pages; **make sure you have them all.** Page 11 is blank. Use as scratch paper, anything written on it will NOT be graded.

Please place answers in designated spaces. **Please write clearly.** Messy or ambiguous answers will not be graded.

This exam is 90 minutes long. No clarifying questions will be answered by the GSI's after the exam begins.

Mark one of the following. If you are enrolled in Chem 3BL, mark off your laboratory section.

___ Lecture Only

___ Completing I Grade
(Professor Name _____)

___ 101 – Michael Chiang

___ 102 – Amy McCarthy

___ 103 – Rob Padilla

___ 107 – Rob Padilla (Evening)

___ 108 – Kevin Zhao

___ 109 – Katherine He

___ 201 – David Nagle

___ 202 – Greg Dallinger

___ 203 – Reyu Sakakibara

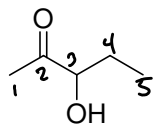
___ 204 – Susan Kim

___ 207 – Arash Nayeri

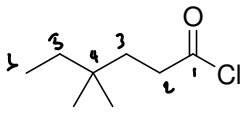
___ 208 – Philip Chung

Do not write in this box	
1) _____	**(12)**
2) _____	**(27)**
3) _____	**(18)**
4) _____	**(18)**
5) _____	**(15)**
6) _____	**(18)**
7) _____	**(17)**
8) _____	**(20)**
9) _____	**(14)**
Total: _____	**(160)**

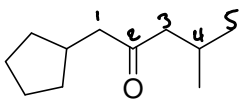
1) (12 pts)
Provide nomenclature or structures for the following:



3-Hydroxy-2-pentanone ok

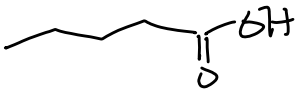


4,4-Dimethyl hexanoyl Chloride

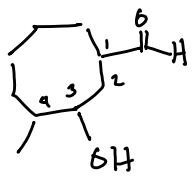


1-Cyclopentyl-4-methyl-2-pentanone ok.

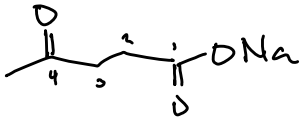
Valeric Acid



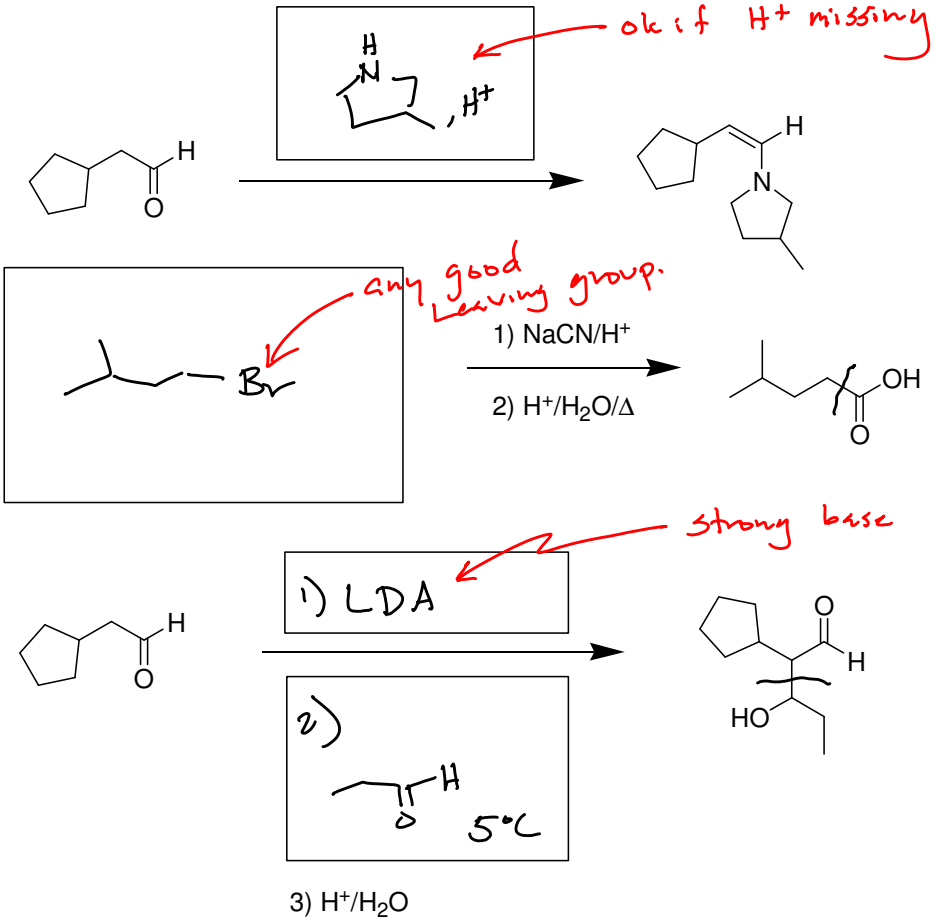
3-hydroxy-4-methyl cyclooctanecarbaldehyde

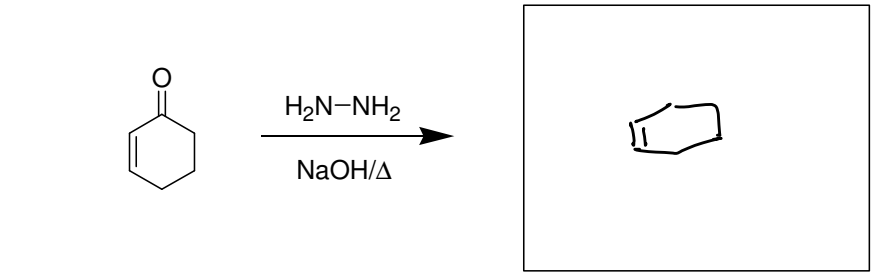


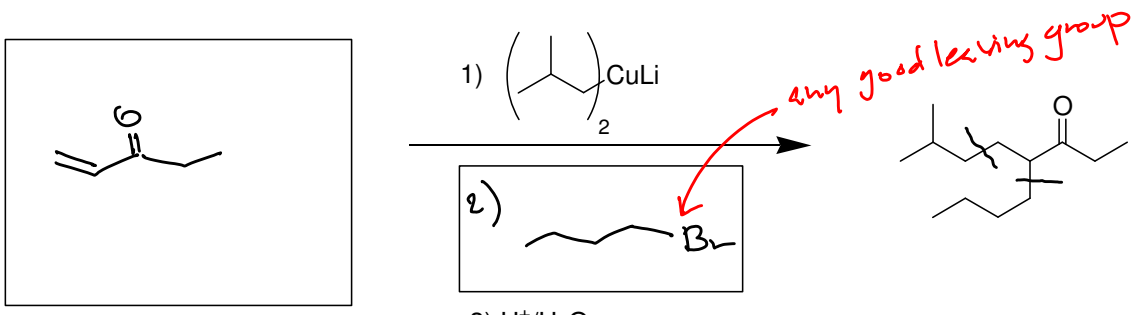
Sodium 4-oxo-pentanoate

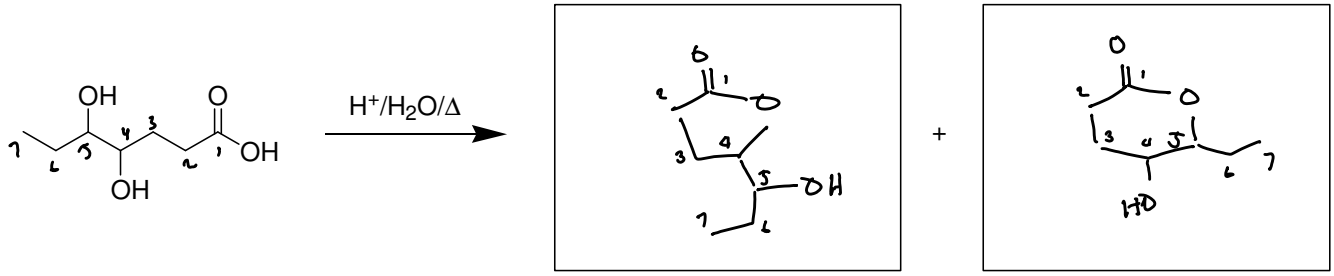


2) (27 pts)
Fill in the boxes. One compound or reaction step per box.

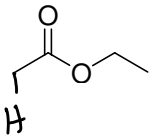


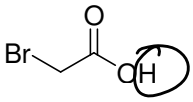


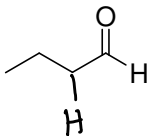




3) (18 pts)
Identify the most acidic proton on each of the following molecules.



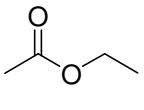




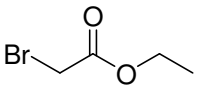
3 1 2

Rank the protons identified above by acidity (1= most acidic)

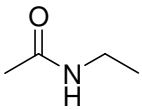
Rank the following molecules by basicity (1= most basic)



2



3



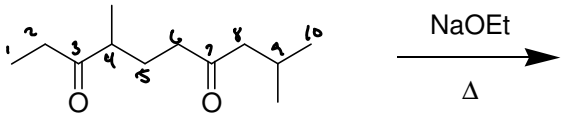
1

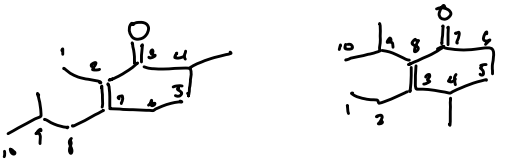
Provide an explanation for your reasoning.

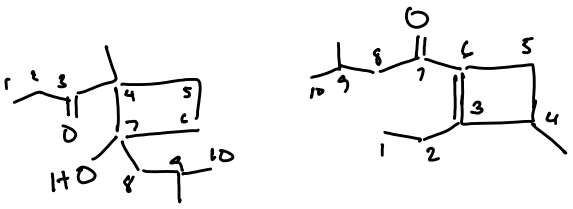
The amide is more basic than an ester because it has a greater contribution of resonance structure above, thus stabilizing the protonated carbonyl.

Addition of the electron withdrawing Br group draws e^- density away from the carbonyl oxygen, making it less likely to become protonated

4) (18 pts)
Provide the structures of the two compounds that can be formed by the following reaction.

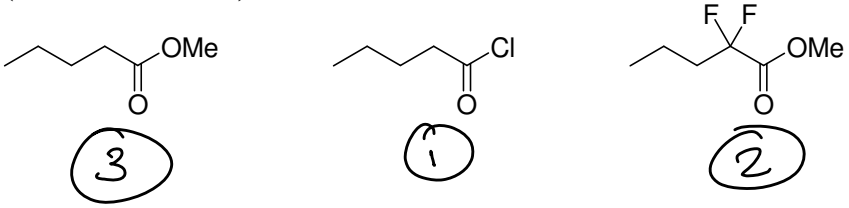




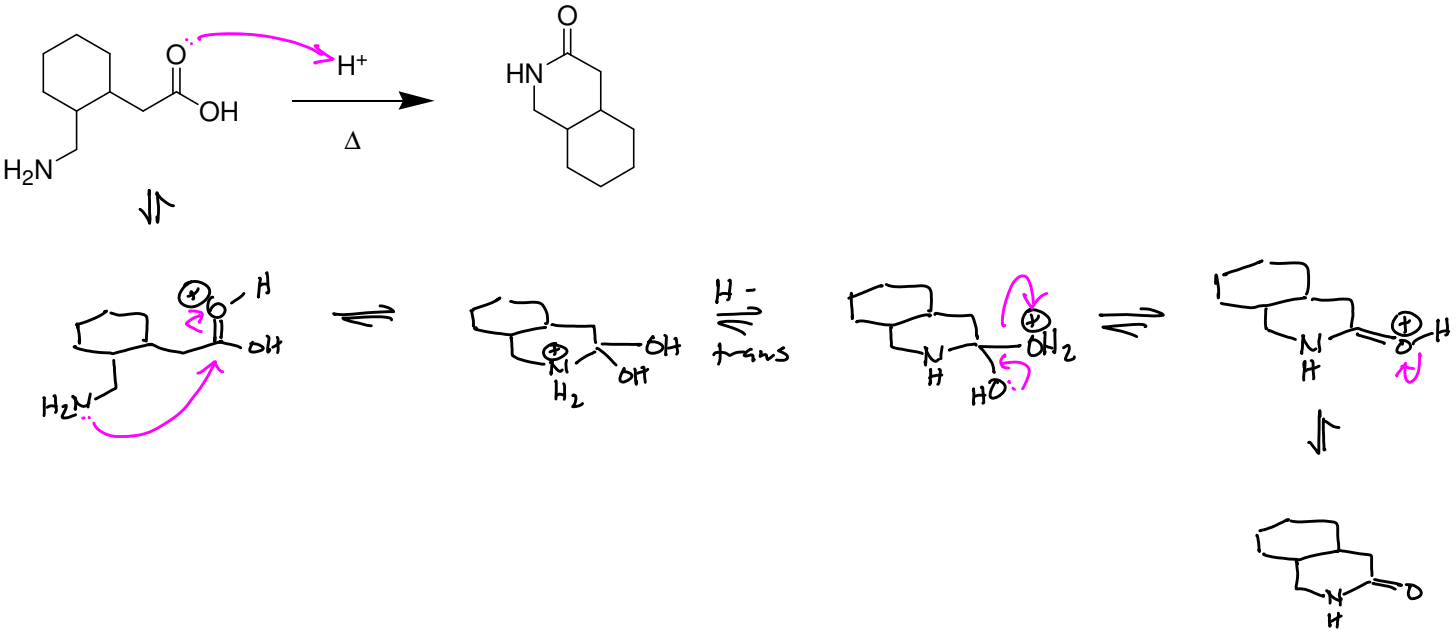


Provide the structures of the starting materials to synthesize the dicarbonyl above.

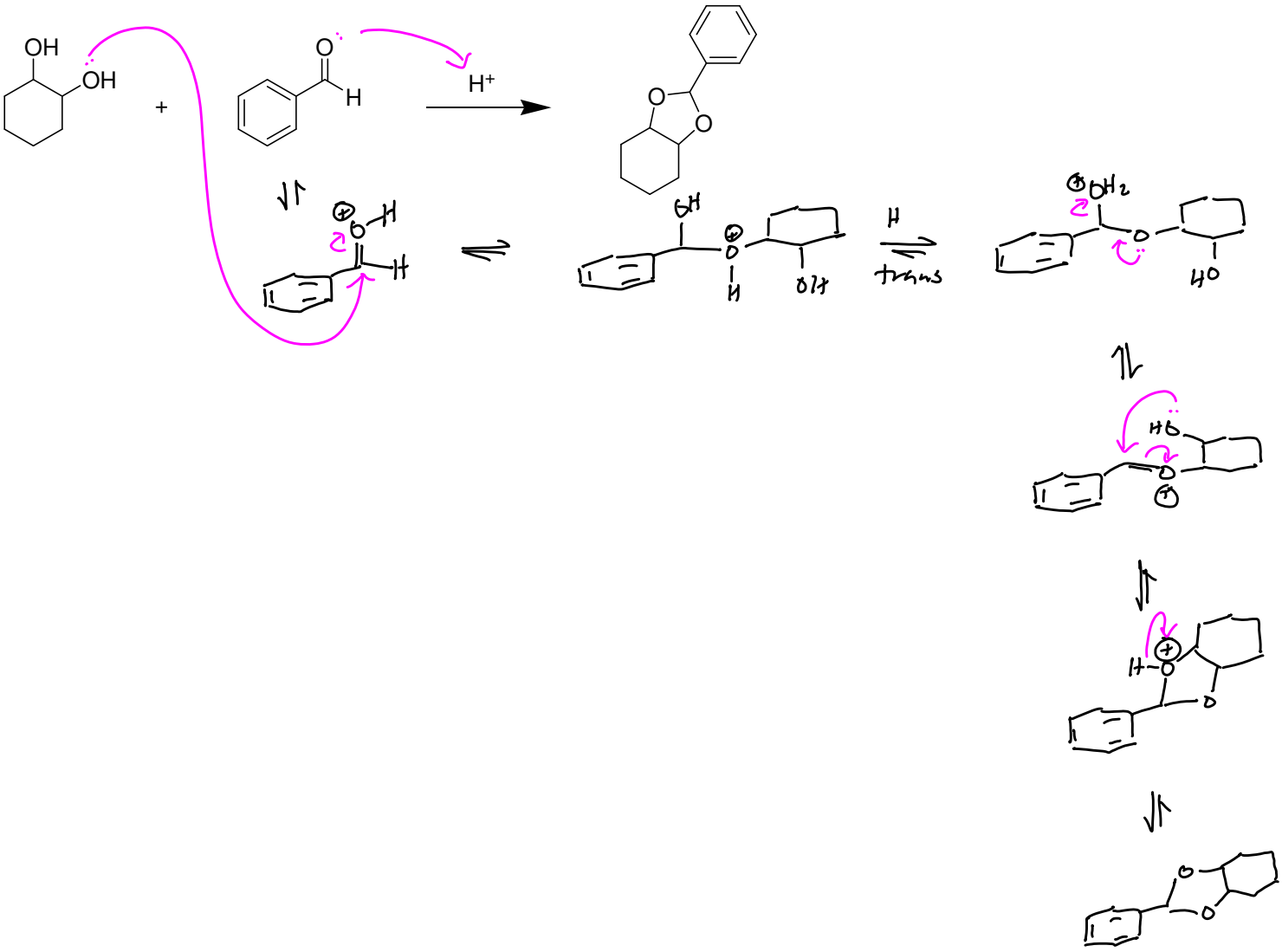
Rank the following molecules by decreasing reactivity toward addition-elimination mechanisms.
(1= most reactive)



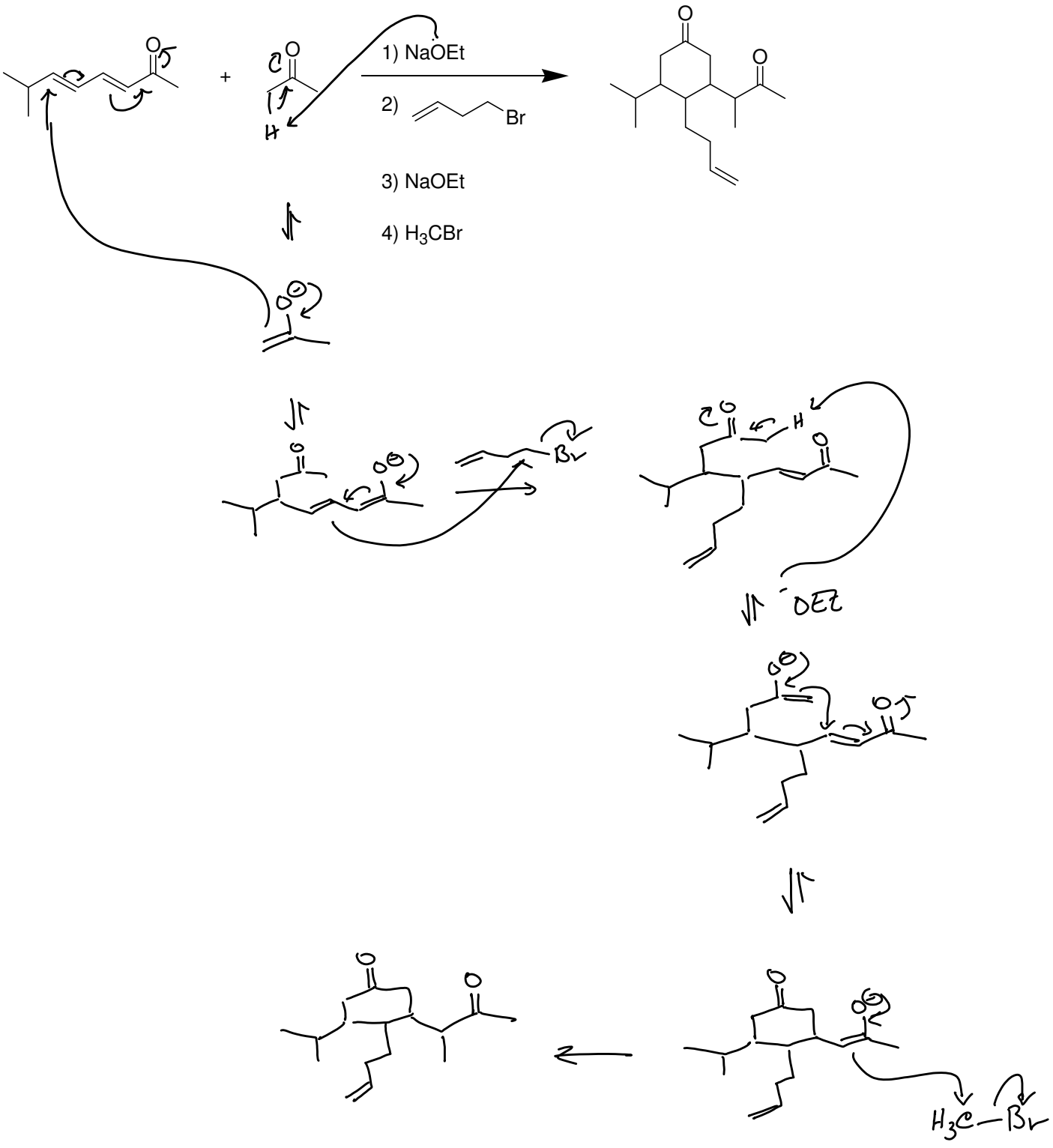
5) (15 pts)
Provide a mechanism for the following transformation.



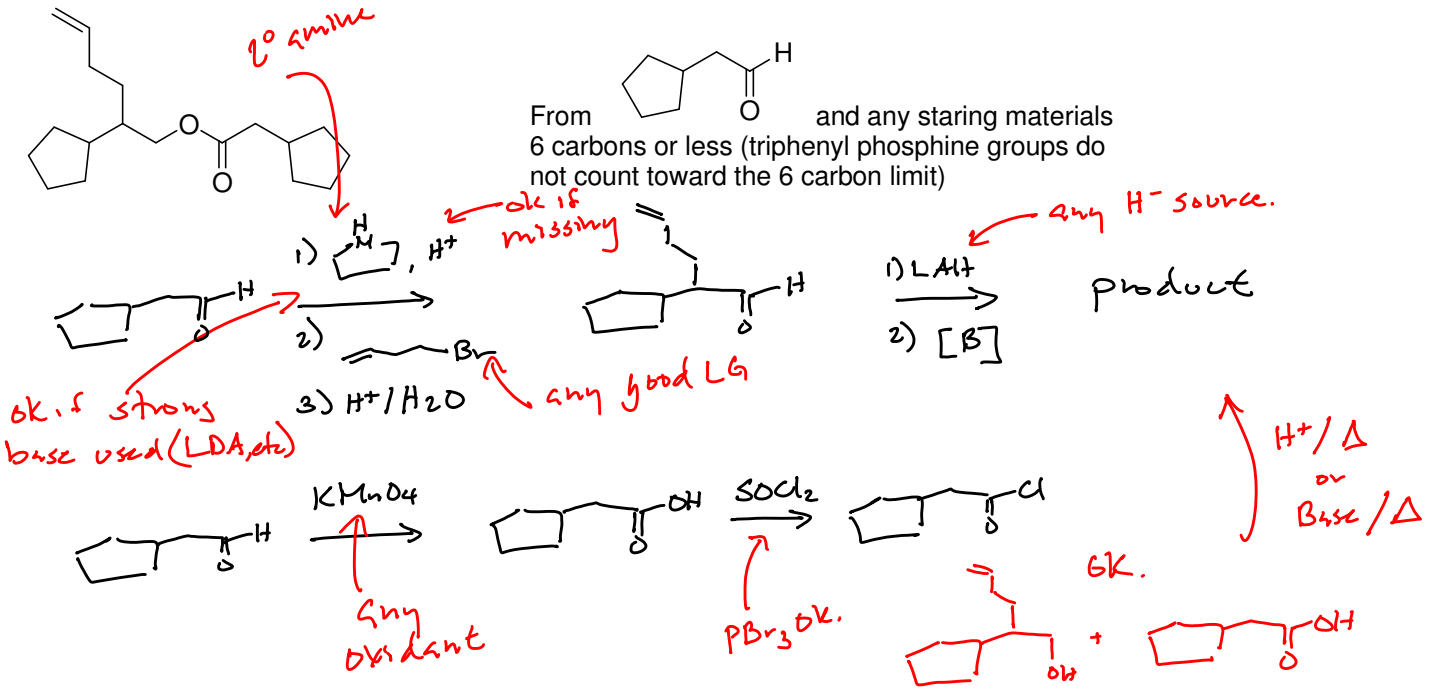
6) (18 pts)
Provide a mechanism for the following transformation.



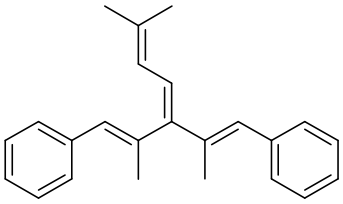
7) (18 pts)
Provide a mechanism for the following transformation.

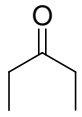


8) (20 pts)
Provide the best synthetic route to the following molecule.



9) (14 pts)
Provide the best synthetic route to the following molecule.



From  and any starting materials 7 carbons or less (triphenyl phosphine groups do not count toward the 7 carbon limit)