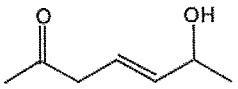
JASPERSE CHEM 342 TEST 3 VERSION 2
Ch 19 Ketones and Aldehydes
Ch 22, 23 Additions and Conensations of Enols and Enolate Ions

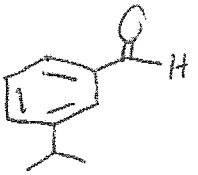
1. Nomenclature. Provide the structure or the name for the following. If stereochemistry is a factor, do not neglect it. (6 pt)

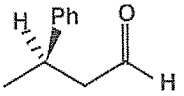
(E)-6-hydroxyhept-4-en-2-one



trans-6-hydroxy-4-hepten-2-one

3-isopropylbenzaldehyde

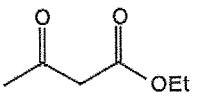




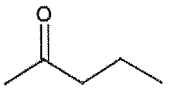
optically active

(R)-3-phenylbutanal

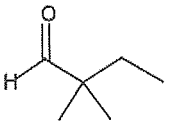
2. Rank the following, with 1 being highest, or most. (6 pt)



1

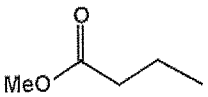


2

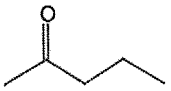


3

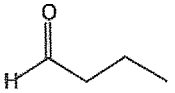
Equilibrium concentration of enol



3

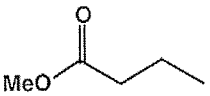


2

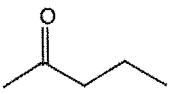


1

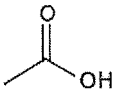
Reactivity toward MeMgBr



3



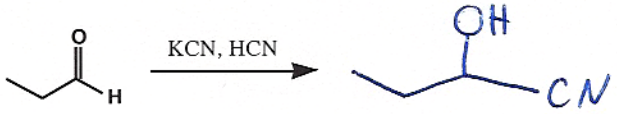
2

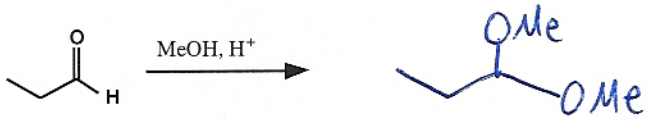


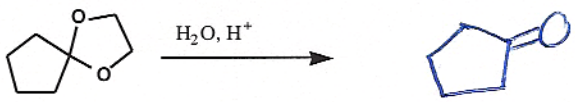
1

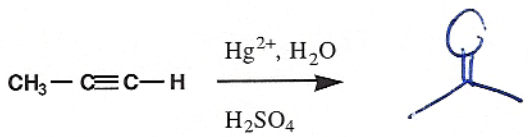
Acidity

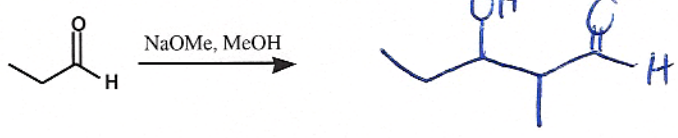
3. Draw the products for the following reactions (3 pt each)

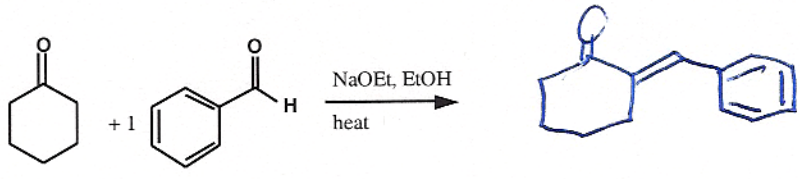


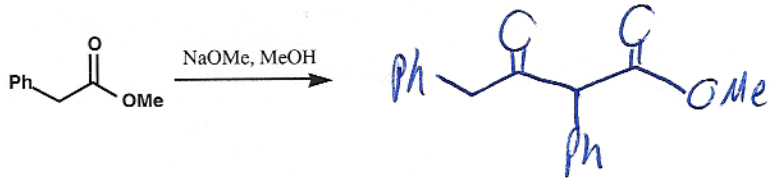




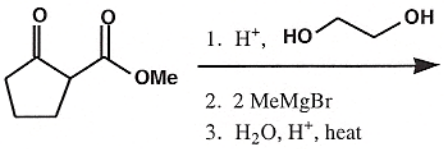


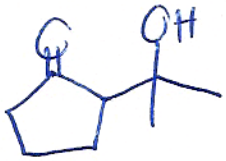




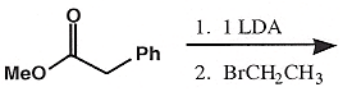


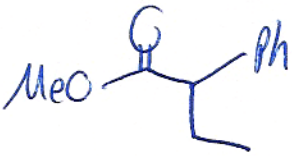
4. Draw the products for the following multistep reactions. (3 pt each)

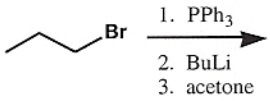


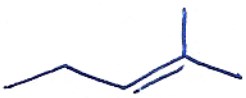


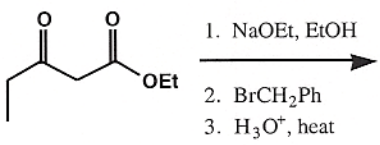
Protection Chemistry

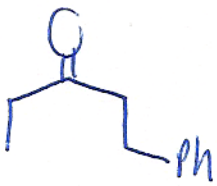




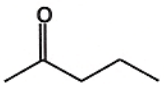


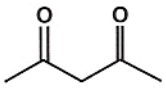


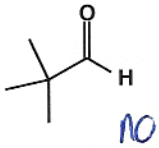




5. For the following chemicals, describe the extent to which each would be deprotonated by LDA (LiN-iPr_2) or by NaOH at equilibrium. Fill in all 6 boxes. Options are complete deprotonation (A), a little deprotonation (B), and no deprotonation (C). (6 pt)





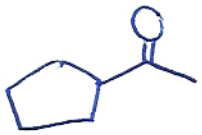


	LDA	NaOH
	A	B
	A	A
	C	C

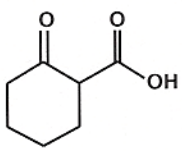
Options:
A = completely (~100%)
B = a little, but not much (< 10% but not 0%)
C = none at all (0%)

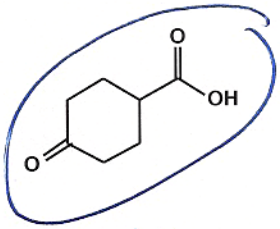
no α-H's to take off!

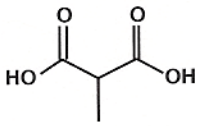
6. Suggest a plausible structure consistent with the following information. (5 pt)
a. It reacts positively with 2,4-dinitrophenylhydrazine.
b. It reacts positively with $NaOH/I_2$, the iodoform test
c. It does not react with Tollen's reagent [$Ag(NH_3)_2^+OH^-$].
d. It does not react with Br_2 in dichloromethane solvent.
e. Chemical formula is **$C_7H_{12}O$**
f. It's ^{13}C spectrum shows 5 carbons (1 singlet, 1 doublet, 2 triplets, and 1 quartet)



7. Which of the following would not undergo decarboxylation (loss of CO_2) upon heating? (2 pt)

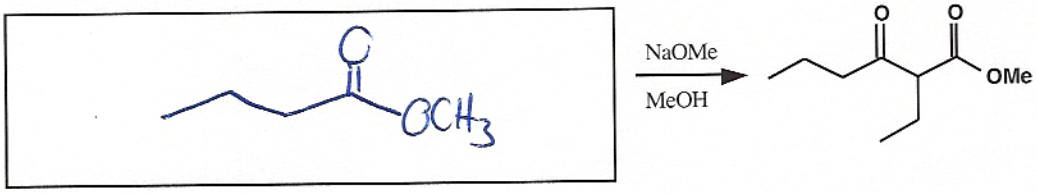


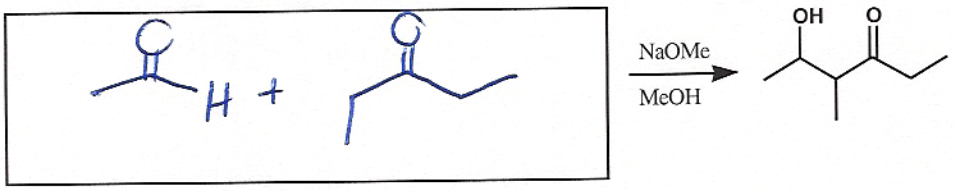


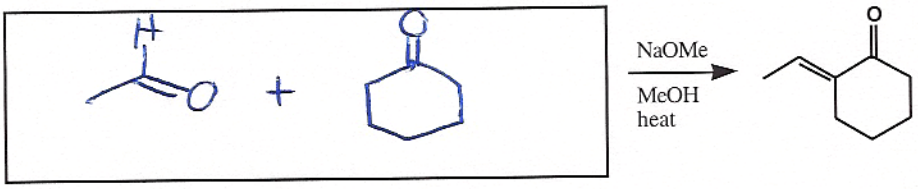


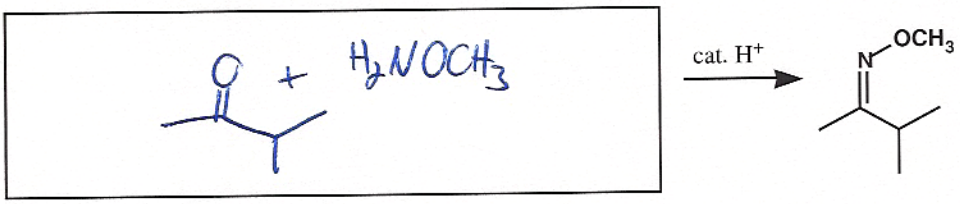
Not 1,3

8. Put in the starting materials from which the following would be made. (3 each)

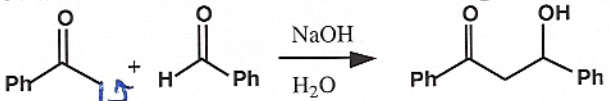


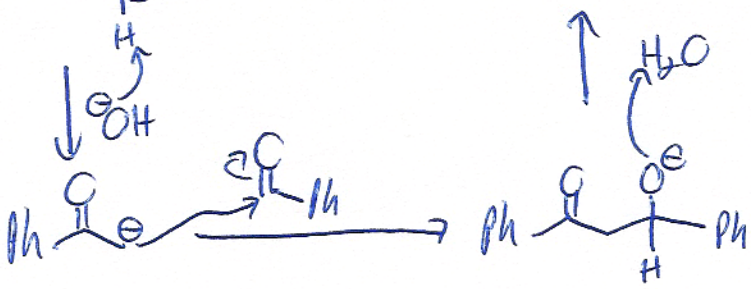




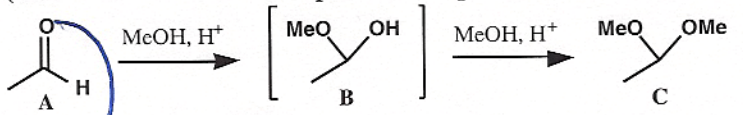


9. Draw the mechanisms for the following reactions. (4 pt each)

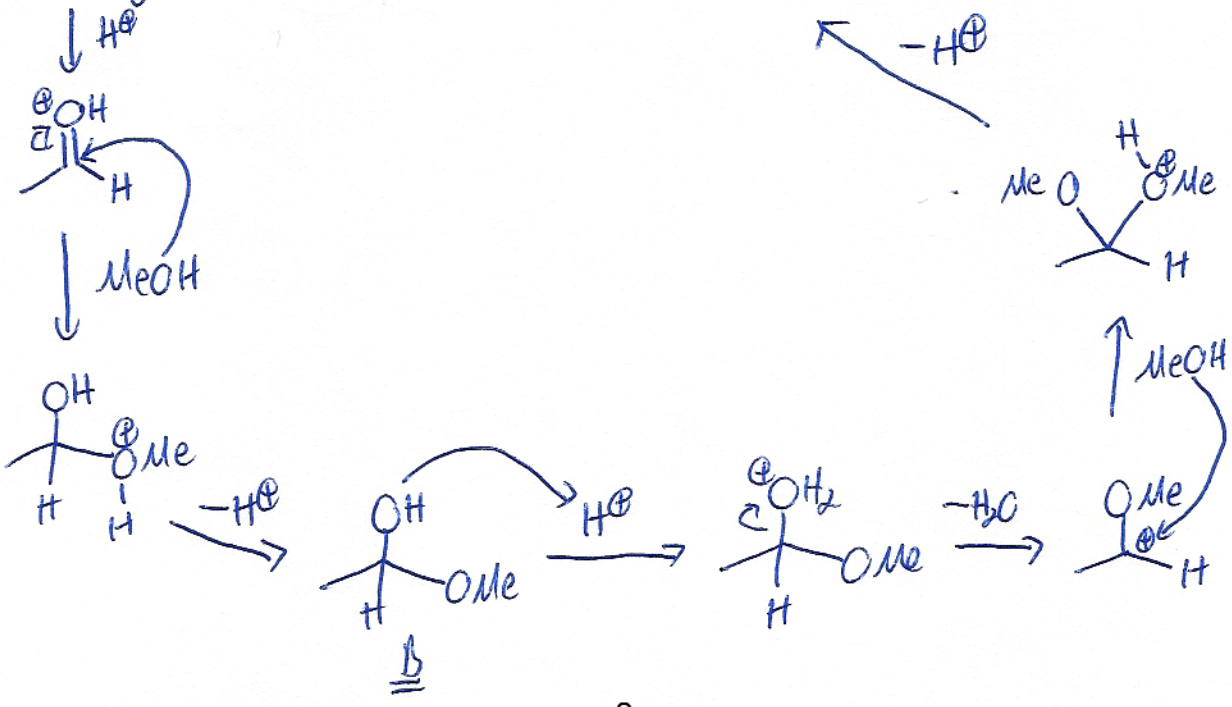


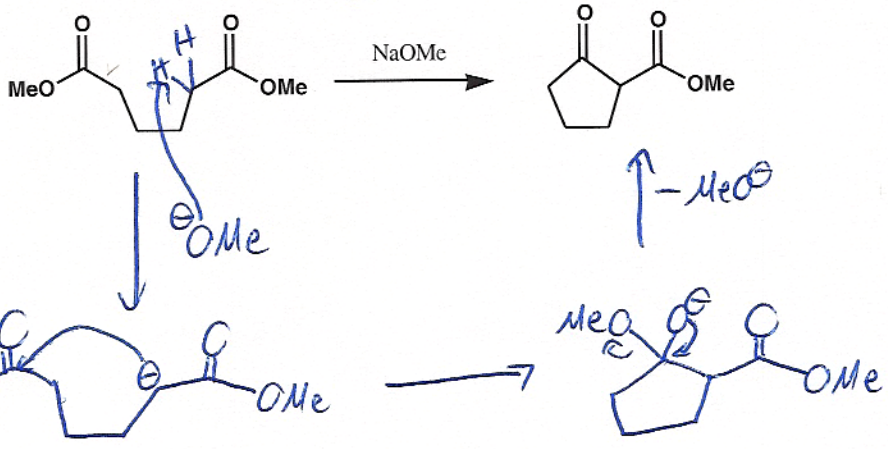


(Note: this one counts as 2 problems, 8 points total)

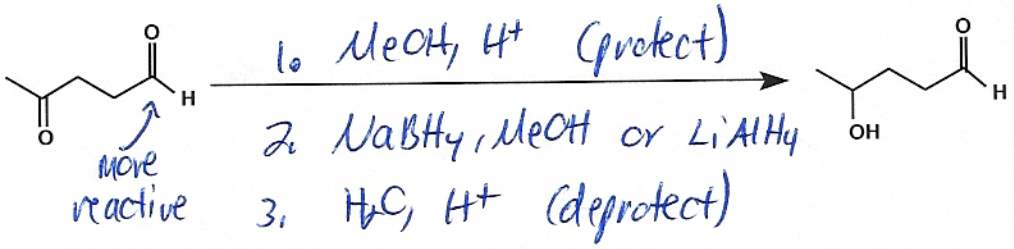


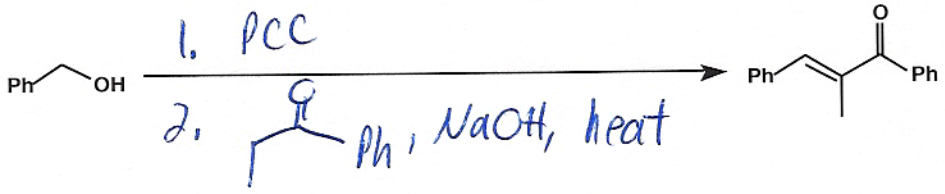
All steps are actually in equilibrium, but I only want you to show the forward direction





10. Provide reagents for the following transformations. (4 pt each)





11. Design a synthesis for the following alkene **FROM ALCOHOLS WITH NO MORE THAN 5 CARBONS**. (6 pt)