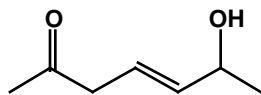
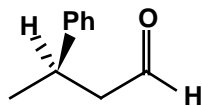


1. Nomenclature. Provide the structure or the name for the following. If stereochemistry is a factor, do not neglect it. (6 pt)

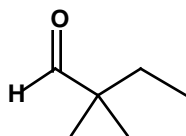
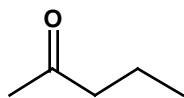
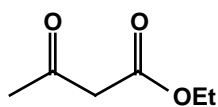


3-isopropylbenzaldehyde

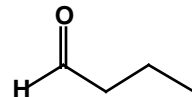
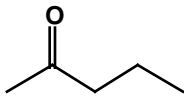
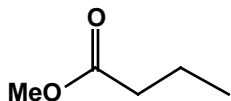


optically active

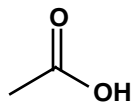
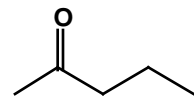
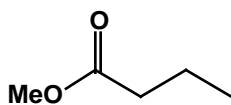
2. Rank the following, with 1 being highest, or most. (6 pt)



Equilibrium concentration of enol

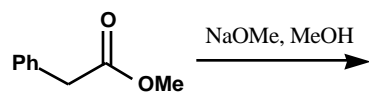
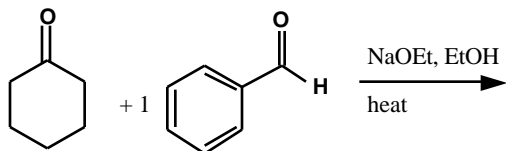
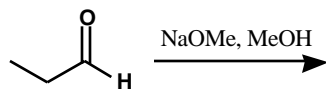
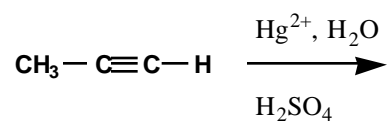
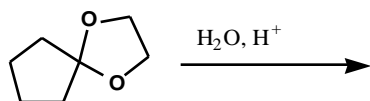
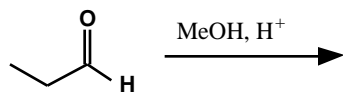
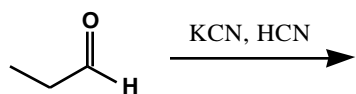


Reactivity toward MeMgBr

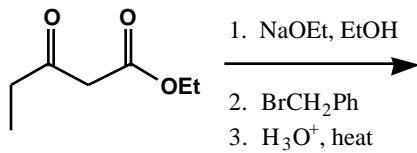
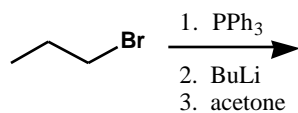
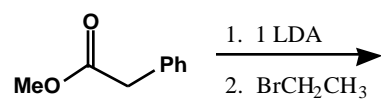
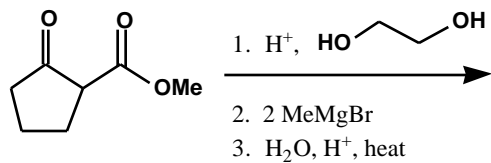


Acidity

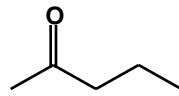
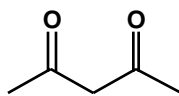
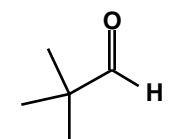
3. Draw the products for the following reactions (3 pt each)



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



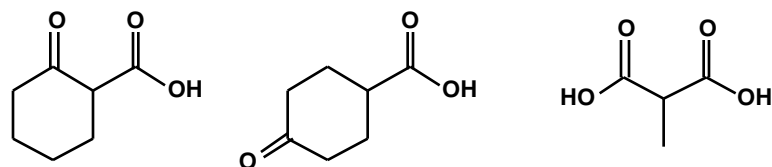
5. For the following chemicals, describe the extent to which each would be deprotonated by LDA (LiN-*i*Pr₂) or by NaOH at equilibrium. Fill in all 6 boxes. Options are complete deprotonation (A), a little deprotonation (B), and no deprotonation (C). (6 pt)

	LDA	NaOH	
	<input type="text"/>	<input type="text"/>	Options: A = completely (~100%) B = a little, but not much (< 10% but not 0%) C = none at all (0%)
	<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>	

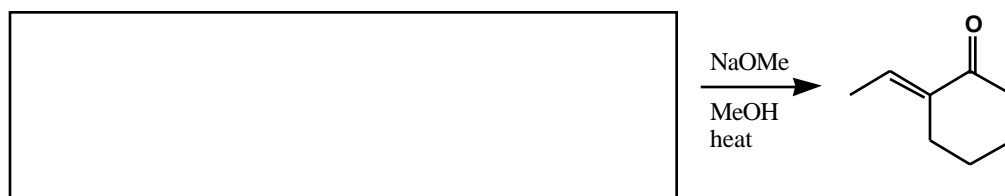
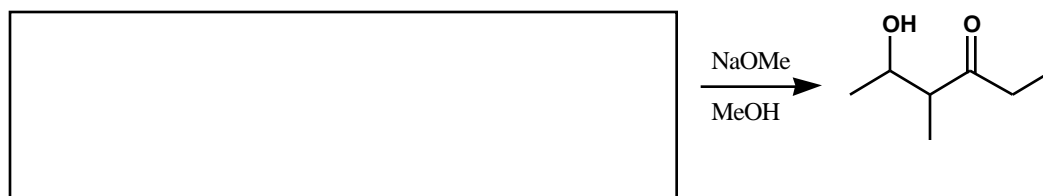
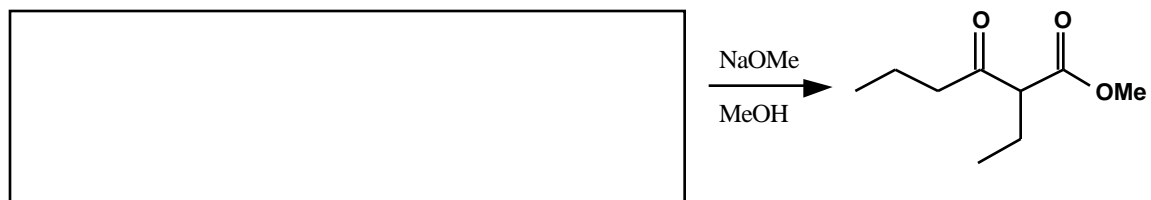
6. Suggest a plausible structure consistent with the following information. (5 pt)

- It reacts positively with 2,4-dinitrophenylhydrazine.
- It reacts positively with NaOH/I₂, the iodoform test
- It does not react with Tollen's reagent [Ag(NH₃)₂⁺OH⁻].
- It does not react with Br₂ in dichloromethane solvent.
- Chemical formula is **C₇H₁₂O**
- It's ¹³C spectrum shows 5 carbons (1 singlet, 1 doublet, 2 triplets, and 1 quartet)

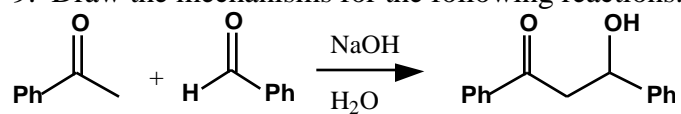
7. Which of the following would not undergo decarboxylation (loss of CO₂) upon heating? (2 pt)



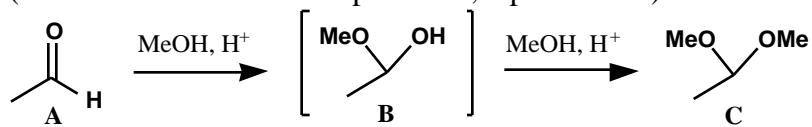
8. Put in the starting materials from which the following would be made. (3 each)



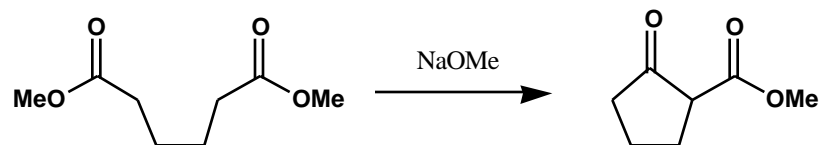
9. Draw the mechanisms for the following reactions. (4 pt each)



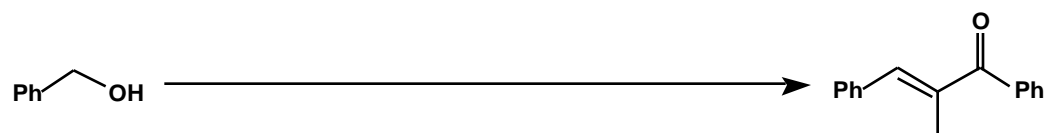
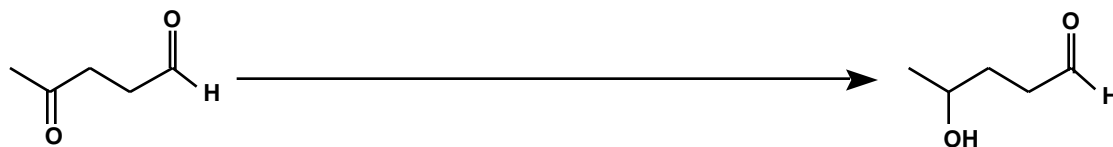
(Note: this one counts as 2 problems, 8 points total)



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)

