Read sections 16.1-16.3 in the book.

1. Draw methyl hexyl ketone.

2. What is the IUPAC name for the molecule above?

3. Show how the ketone above could be prepared directly from an alcohol.

Read section 16.4 in the book.

4. Why is it unusual for ketones to be made directly from alkenes? What is "wrong" with that method? (this is a philosophical question, not a science issue)

5. Draw the mechanism for the preparation of a ketone from a nitrile and a Grignard reagent. Skip the steps involving the water and acid at the end of the reaction.

6. Draw a nitrile and Grignard reagent pair that you could use to prepare methyl hexyl ketone from a nitrile?

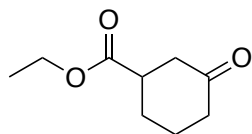| nitrile	Grignard reagent

7. draw 2-methylhexanal.

8. Show three different ways to make 2-methylhexanal.

a. begin with a carboxylic acid which you will need to convert to something else (see Section 16.4C)

b. begin with an alcohol

c. begin with an alkene

9. Consider this molecule.

a. draw the product that would be expected if this reactant is treated with an excess of LIAlH$_4$ in dry ether followed by water. (review section 12.3)

b. draw the product that would be expected if this reactant is treated with an excess of NaBH$_4$ in ethanol followed by water.

c. draw the product that would be expected if this reactant is treated with an excess of CH$_3$MgBr in dry ether followed by aqueous acid.

d. Read Section 16.7 (especially 16.7C) then repeat each of the steps above but begin with the formation of protecting group using $HOCH_2CH_3\,OH$ with HCl (gas) and then deprotect using H_3O^+ in the last step of each reaction.

e. Read section 16.8 (skip 16.8D) and complete the following reaction by drawing the product that would form.

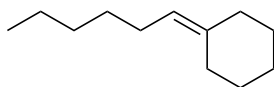|		
	NH_2OH ———→	
	H_2NNH_2 ———→	
	$CH_3CH_2NH_2$ ———→	
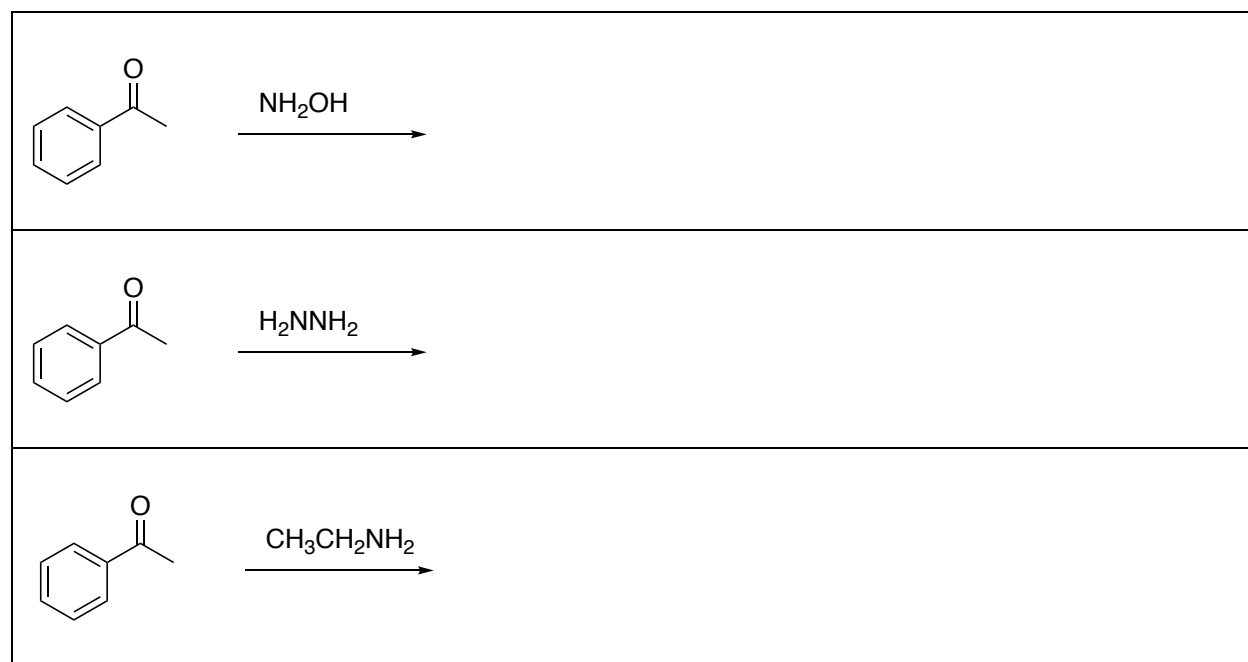
Read Section 16.10 (skip 16.10B)
10. THE WITTIG REACTION

What retrosynthetic fact applies to the reaction?

ALKENE => _____ & _____

11. Consider a Wittig synthesis of this alkene:

Suggest two organic starting materials each with no more than 6 c's.

| | |
| | |

12. Outline the synthesis using your two starting materials (on the back of the page).