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<p>CEM 352 –Quiz 3b</p> <p>Spring 2026</p>	
NAME	

Score		

1	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)
	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)
	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)

(0)	(0)	(0)
(1)	(1)	(1)
(2)	(2)	(2)
(3)	(3)	(3)
(4)	(4)	(4)
(5)	(5)	(5)
(6)	(6)	(6)
(7)	(7)	(7)
(8)	(8)	(8)
(9)	(9)	(9)

**READ THIS!**  
*Bubble in your PID in the space above. Write your answer for each question in the space provided.*

**LEAVE THIS COVER SHEET ATTACHED TO THE QUIZ!**

1. \_\_\_\_\_/8

2. \_\_\_\_\_/16

3. \_\_\_\_\_/16

4. \_\_\_\_\_/11

<p><b>CIRCLE THE 'H' BELOW</b></p> <p>If you are in the <u>Honors College</u> and/or <u>Registered</u> for the CEM352 Honors Option</p>
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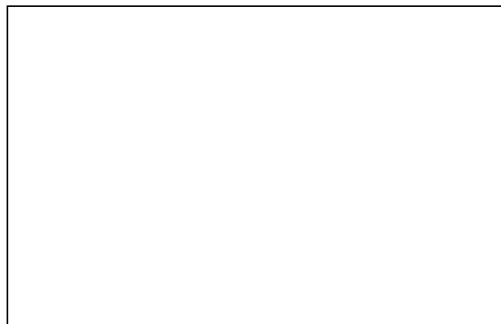
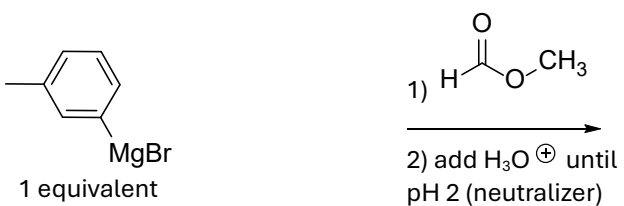
H

TOTAL: \_\_\_\_\_ / 50

HONORS OPTION \_\_\_\_\_/6

Show the reaction products.

1) (2 pts)



2) (2 pts)

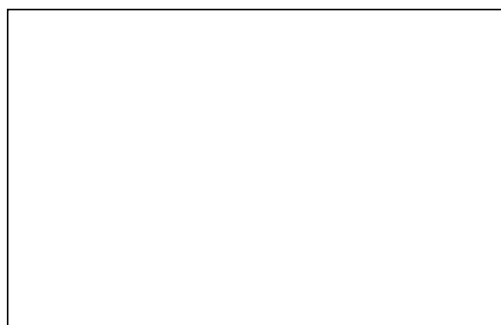
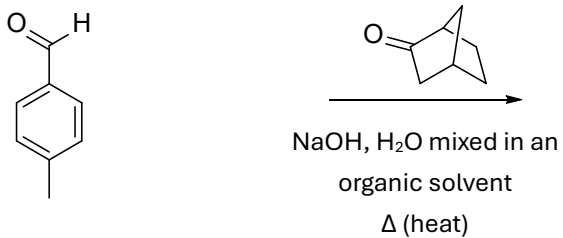


Draw a neutral product

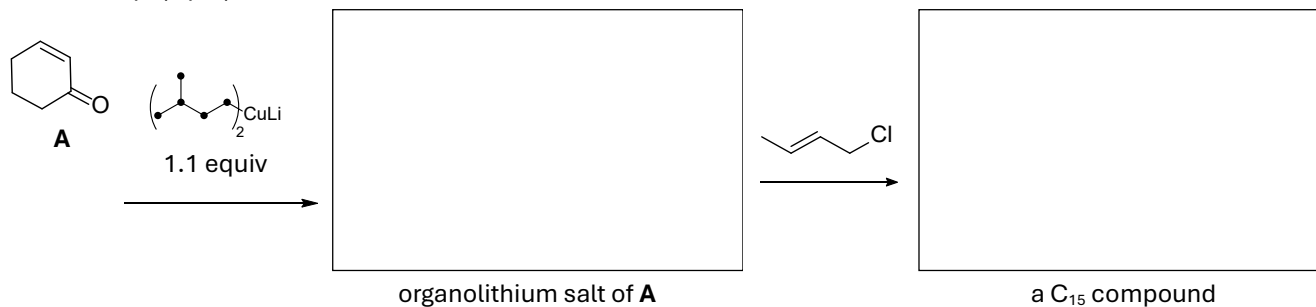
3) (2 pts)



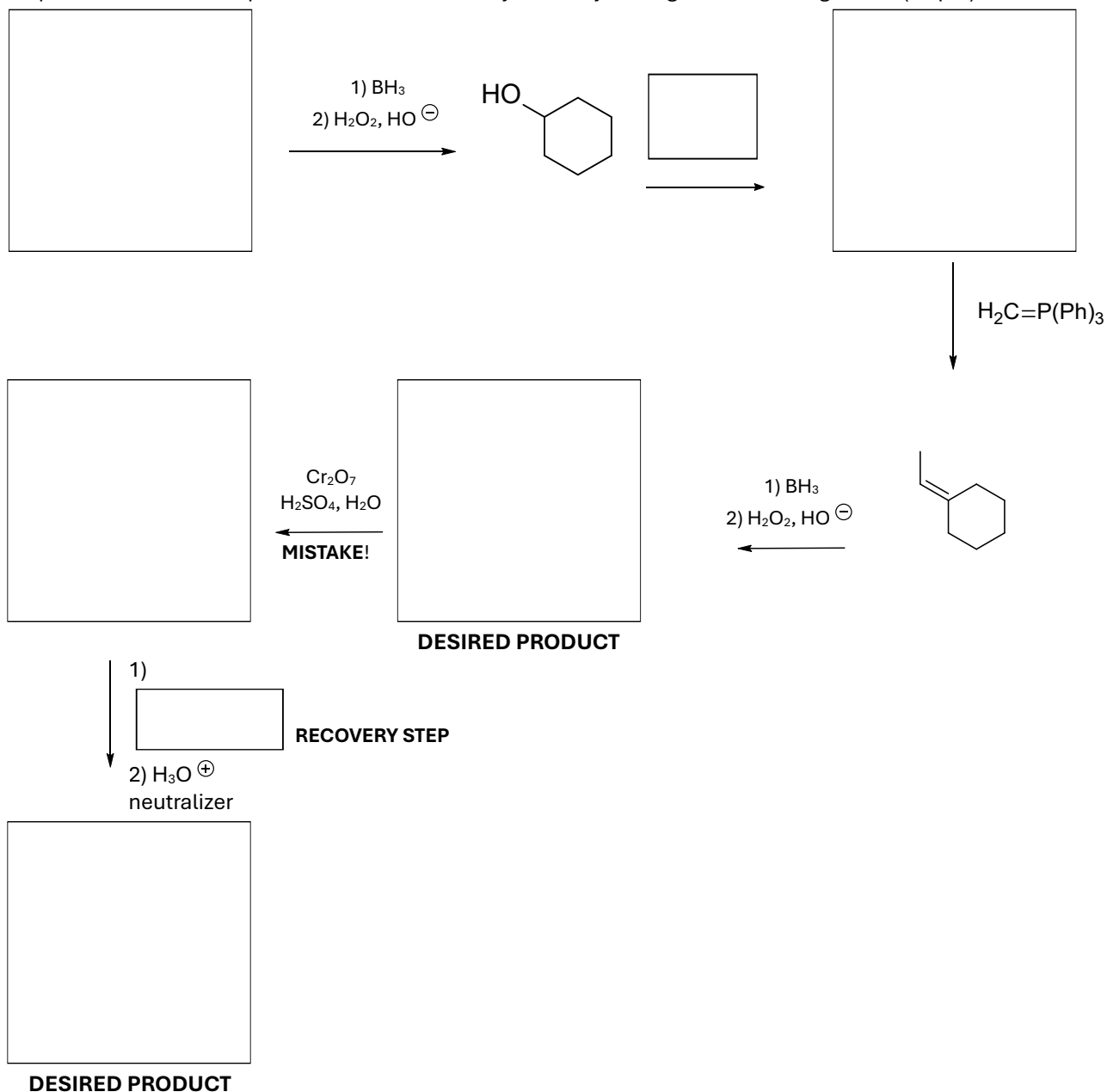
4) A sunscreen, 4-methylbenzylidene camphor, is prepared by a simple cross-aldol condensation using the reaction conditions below. (2 pts)



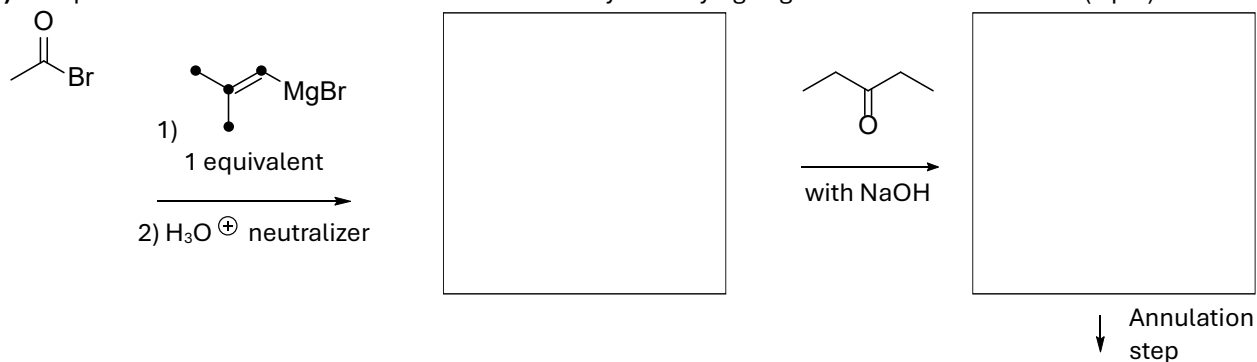
5) Complete the synthesis. The lithium cuprate below is used in slight excess in a reaction that does not contain water as a hydrogen source (i.e., it is an anhydrous solution). The slight excess of the "CuLi" compound traps an organolithium salt after the first step. (4 pts)



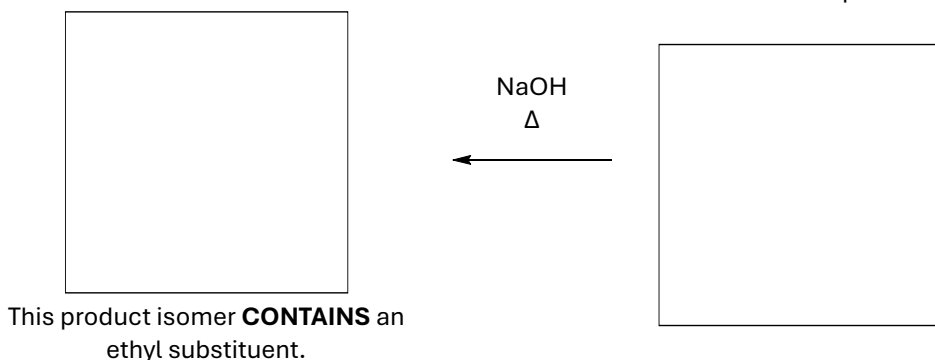
6) An undergraduate researcher was tasked with the following synthesis using principles learned in CEM 351 and 352, but made a mistake. Rather than seeking help from ChatGPT or feeling bad about the error, the student remedied the situation. Complete the reaction sequence below to see what your savvy undergraduate colleague did. (12 pts)



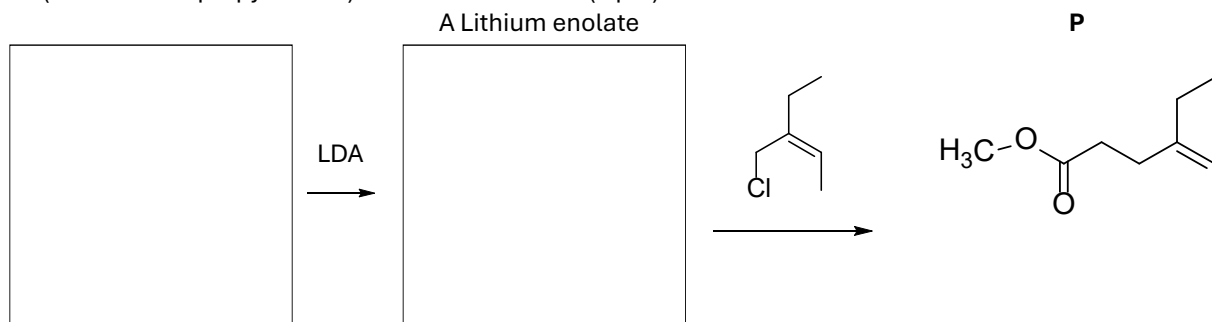
7) Complete the reaction scheme. HINT: Look at what you're trying to get to and think in reverse. (8 pts)



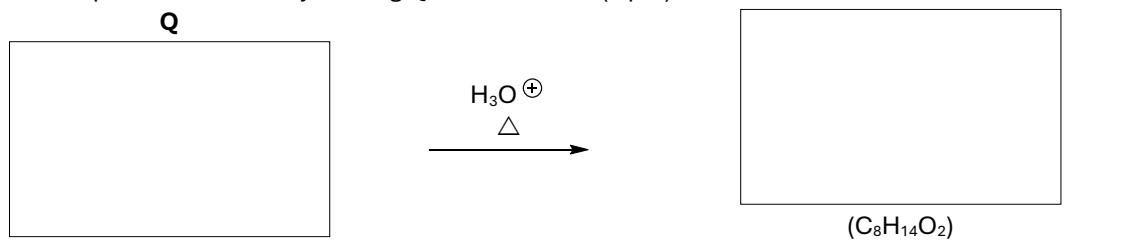
Workspace



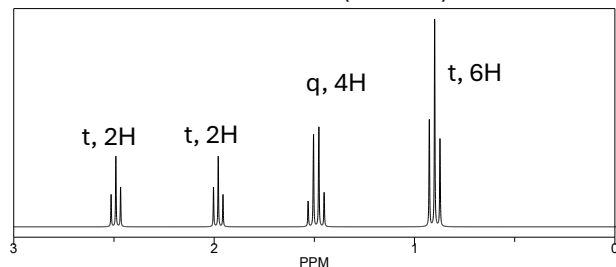
8) Complete the following reaction. HINT: Look “downstream” and infer earlier structures from those provided. LDA (Lithium diisopropyl amide) functions as a base (4 pts)



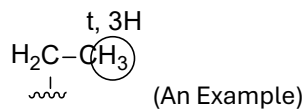
9) Product **P** above is treated with 1)  $\text{Hg}(\text{OAc})_2$ ,  $\text{H}_2\text{O}$ , then 2)  $\text{NaBH}_4$ . These steps convert **P** to **Q**. What is **Q**? The final product is made by heating **Q** in acidic  $\text{H}_2\text{O}$ ? (4 pts)



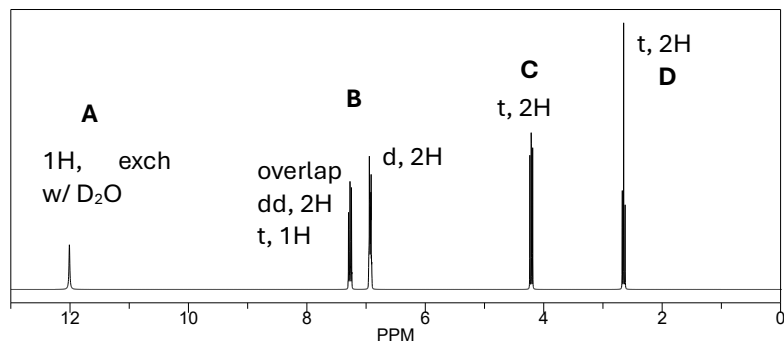
$^1\text{H}$  NMR of the Final Product to help verify your product






10)  $^1\text{H NMR}$ . CIRCLE THE OBSERVED EQUIVALENT H's [PROTONS], and show fragments/connectivities that yield the splitting patterns. (5 pts)



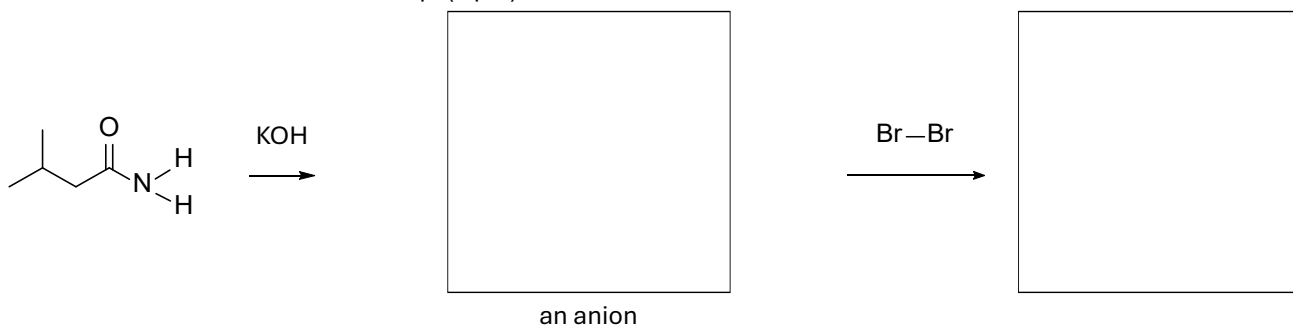
$\text{C}_9\text{H}_{10}\text{O}_3$



**B** (detail the **aromatic** ring H's by showing which is(are) the

<b>dd</b>	<b>t</b>	<b>d</b>	3 pts
			
<b>C</b>			1 pt
<b>D</b>			1 pt

11) These are the initial steps leading to a Hoffman Rearrangement product. Fill them in below, and include the curved arrows to show the mechanism of the last step. (6 pts)



**DRAW CURVED MECHANISM ARROWS TO SHOW HOW THE LAST PRODUCT IS MADE FROM THE ANION**

**Honors Question (FOR HONORS STUDENTS ONLY; NOT EXTRA CREDIT FOR NON-HONORS STUDENTS) (6 pts)**

**1) Reaction Medley.** By now, you are familiar with the reagents used in CEM 351 and 352 and their chemical transformations.

**NOTE: The early structures must be correct for the grader to continue.**

2-3 boxes correct: 1 pt

4-5 boxes correct: 2 pts

6-7 boxes correct: 3 pts

8 boxes correct: 4 pts

9 boxes correct: 5 pts

10-11 boxes correct: 6 pts.

