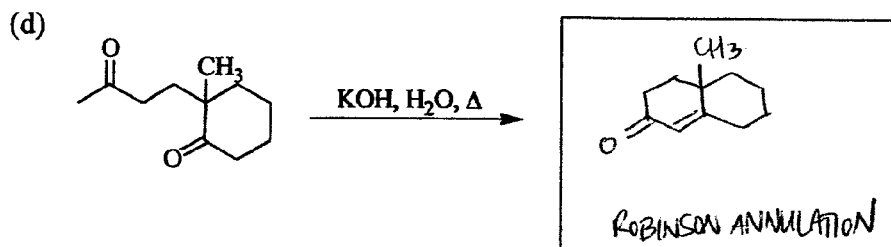
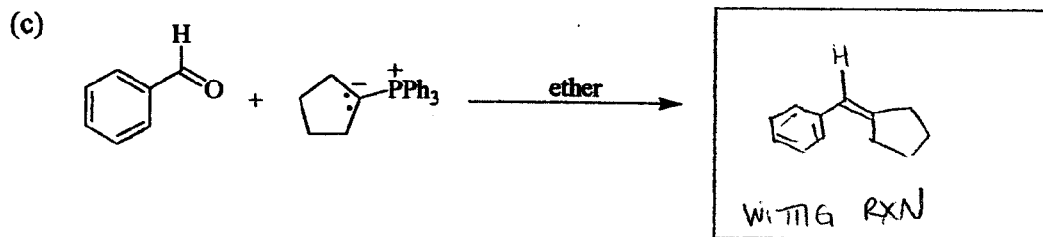
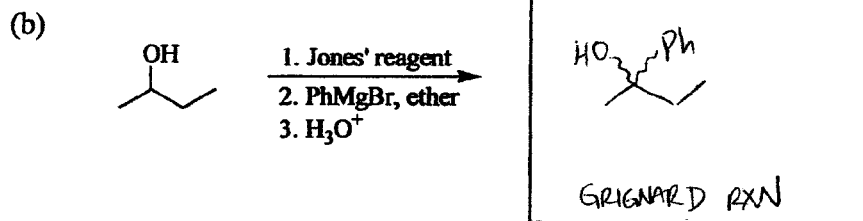
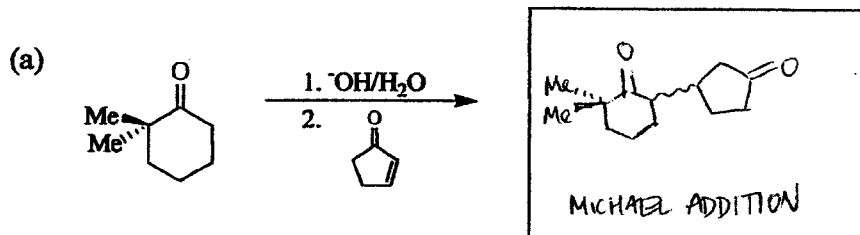


Name: KEY

ID #: \_\_\_\_\_

**Exam III**  
**Chemistry 3231**  
**November 19, 2001**

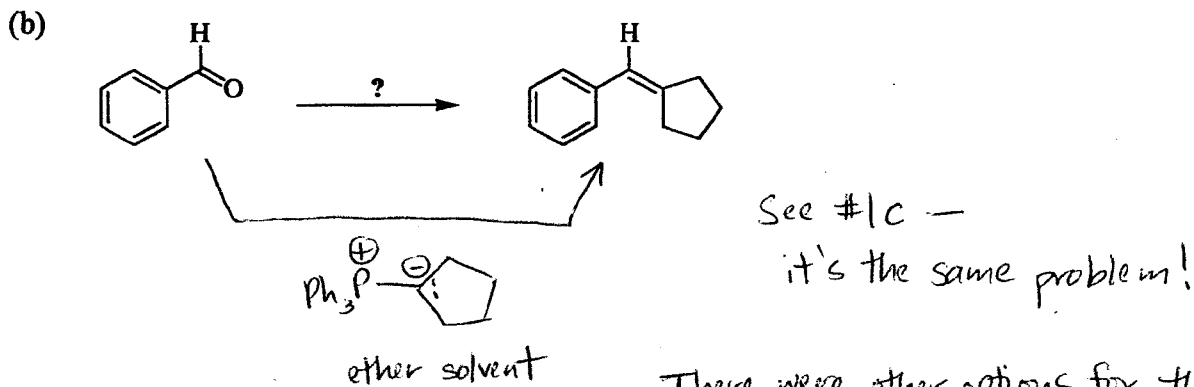
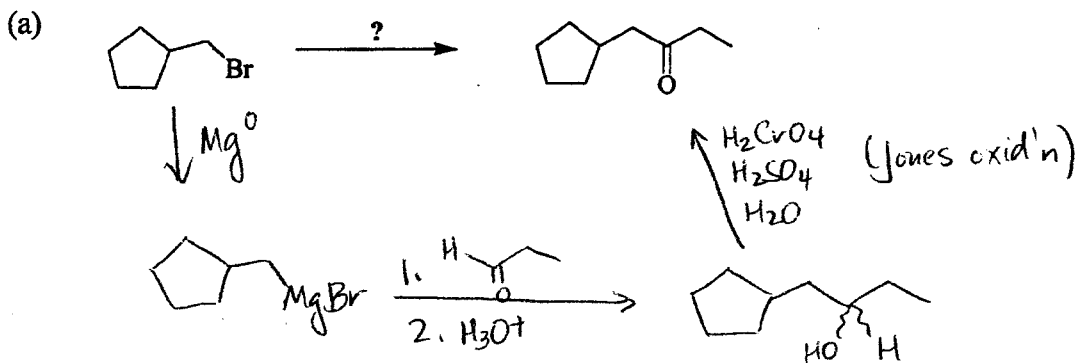
1. For each of the following, give the major organic product. Be sure to indicate stereochemistry where appropriate. Please draw your answers in the boxes provided. Only that which appears in the box will be graded. (7 pts. each, 28 pts. total)



Name: KEY

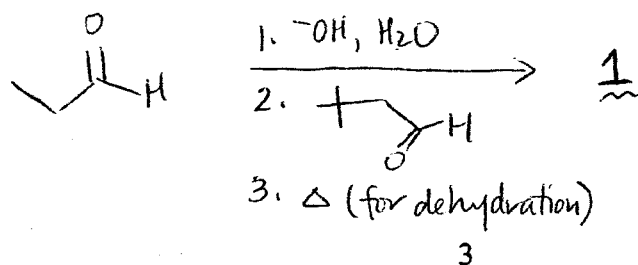
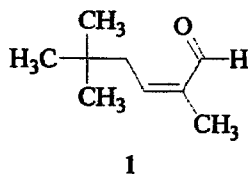
ID #: \_\_\_\_\_

2. Show the steps and intermediates for carrying out the following syntheses. You may use any necessary organic or inorganic materials. (10 pts. each, 30 pts. total)



There were other options for this synthesis, too (e.g. using Grignard chem).

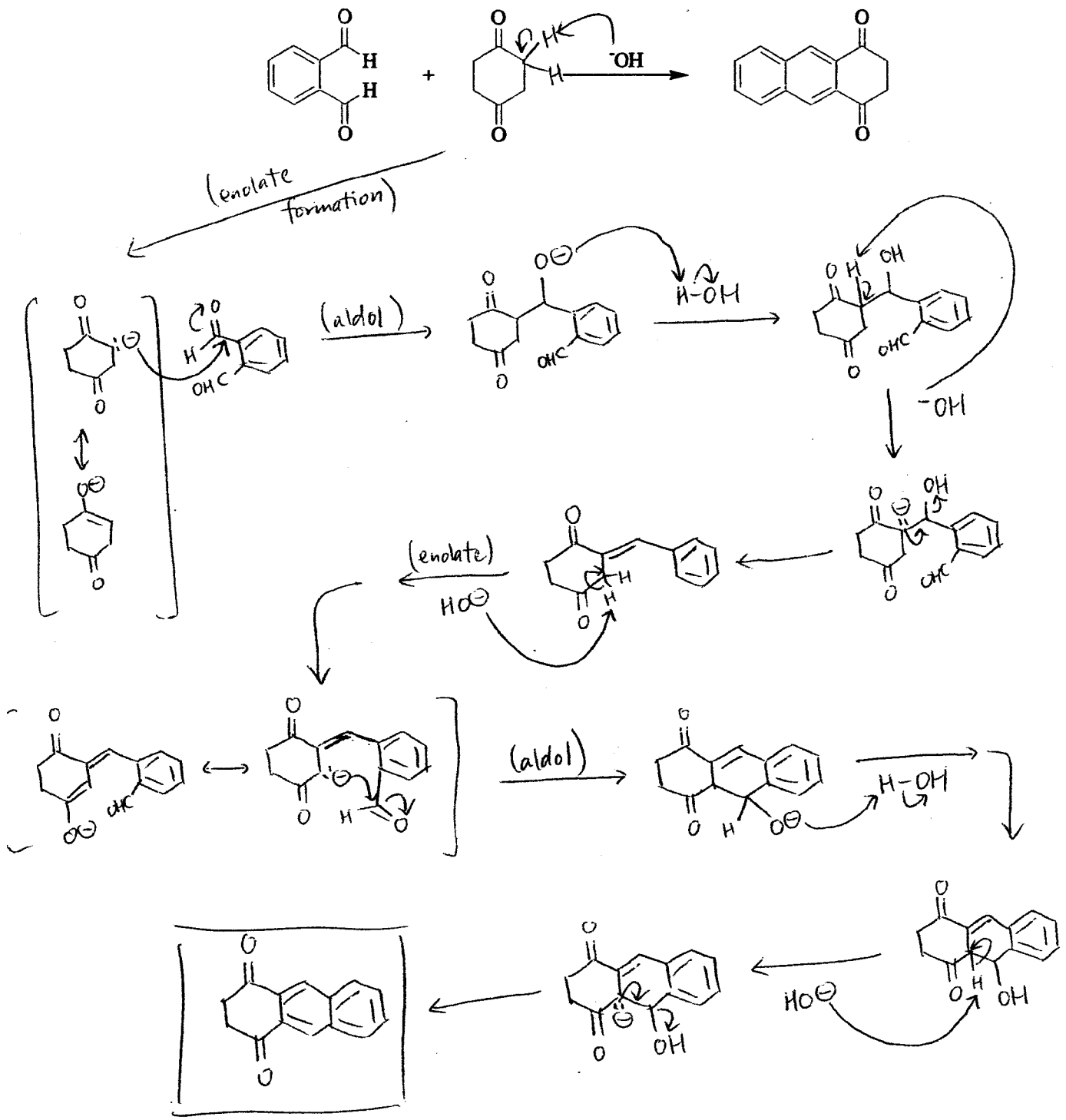
(c) Show the synthesis of 1 by an aldol condensation.



Name: KEY

ID #: \_\_\_\_\_

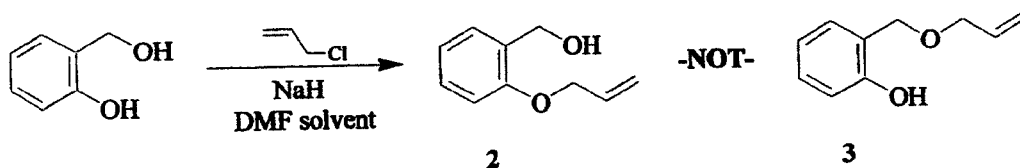
3. Write a detailed mechanism for the reaction shown below. Use curved arrows to illustrate electron pushing. Be sure to show any important resonance structures. (22 pts.)



Name: KEY

ID #: \_\_\_\_\_

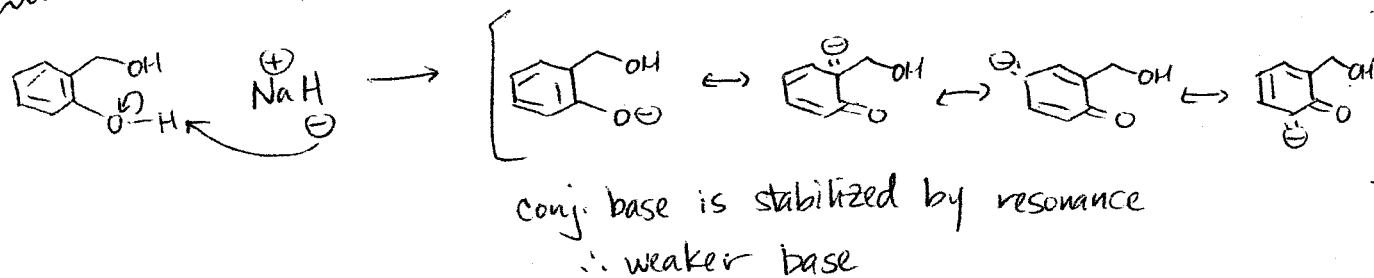
4. Ether 2 is formed preferentially over 3 in the following reaction.



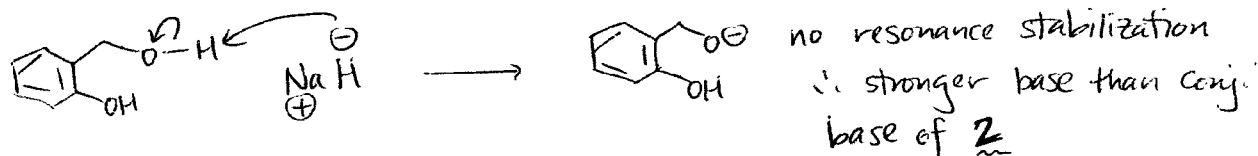
(a) What is the name of this reaction? (5 pts.) Williamson ether synthesis

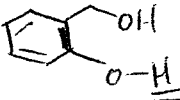
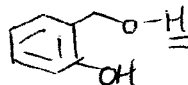
(b) Explain why 2 is formed over 3. Use pictures to support your argument. (15 pts.)

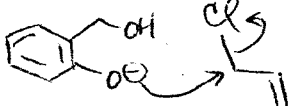
• 2 is formed by deprotonation of the phenolic H:



• 3 is formed by deprotonation of  $1^\circ$  ROH:



• Therefore,  is more acidic than 

so that reaction proceeds via   $\rightarrow$  product 2.  
(S<sub>N</sub>2)