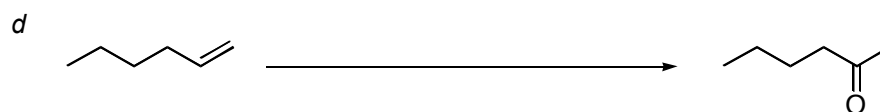
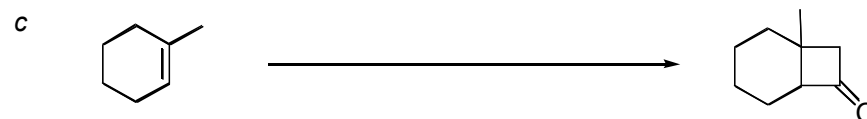
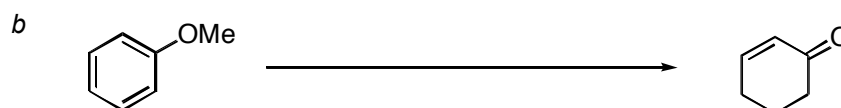


Chem 634
Exam 2
December 16, 2005
3 hours
Prof. Fox

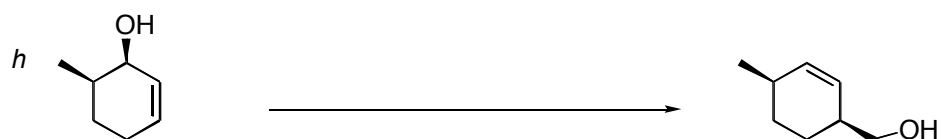
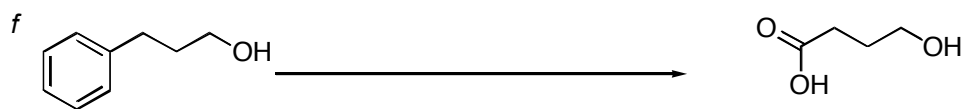
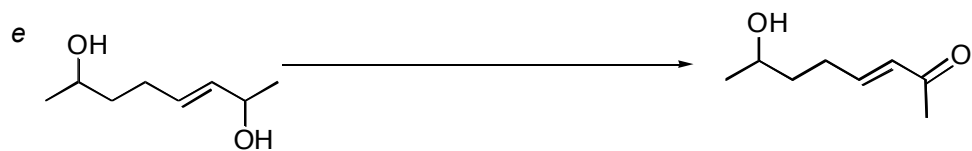
Your Name_____

1. Provide reagents for the following transformation. More than one step may be required.
Do not write mechanisms.

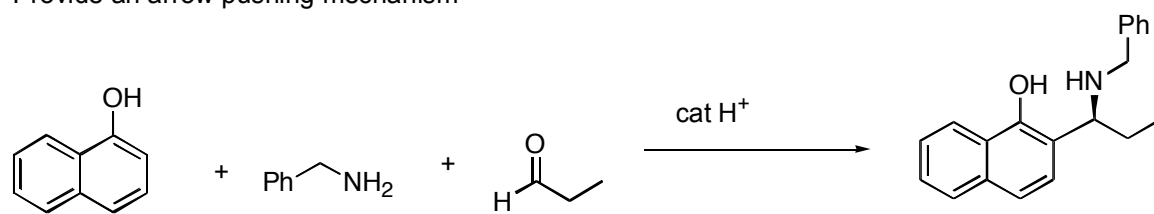
8 parts, 2 points each



Question 1 continued

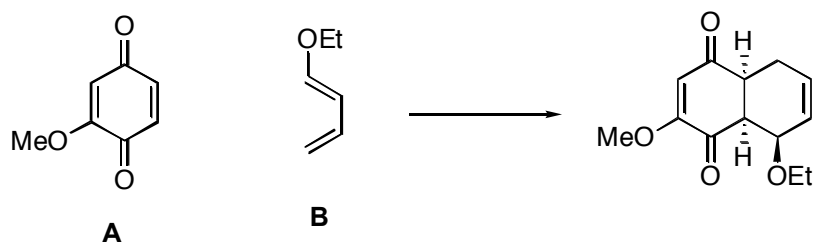


2. Provide an arrow pushing mechanism

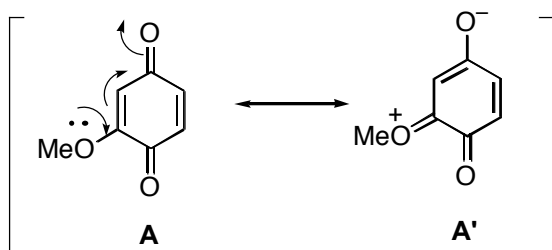


10 points

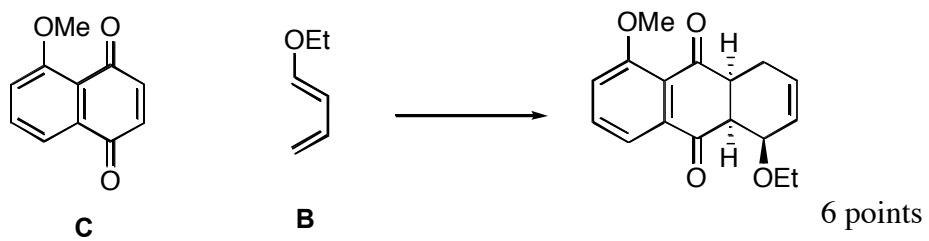
3(a) The reaction of diene **A** with dienophile **B** is regioselective. Explain.



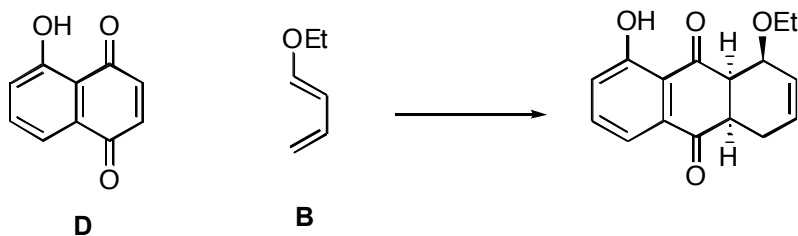
When preparing your answer, consider that the methoxy 'deactivates' the top carbonyl through resonance as shown below. You may assume that the resonance form **A'** is the dominating factor that guides the regioselectivity.



3(b) The reaction of diene **C** with dienophile **B** is also regioselective. Explain.



3(c) The reaction of diene **D** with dienophile **B** displays opposite regioselectivity as compared to **C**. Explain.

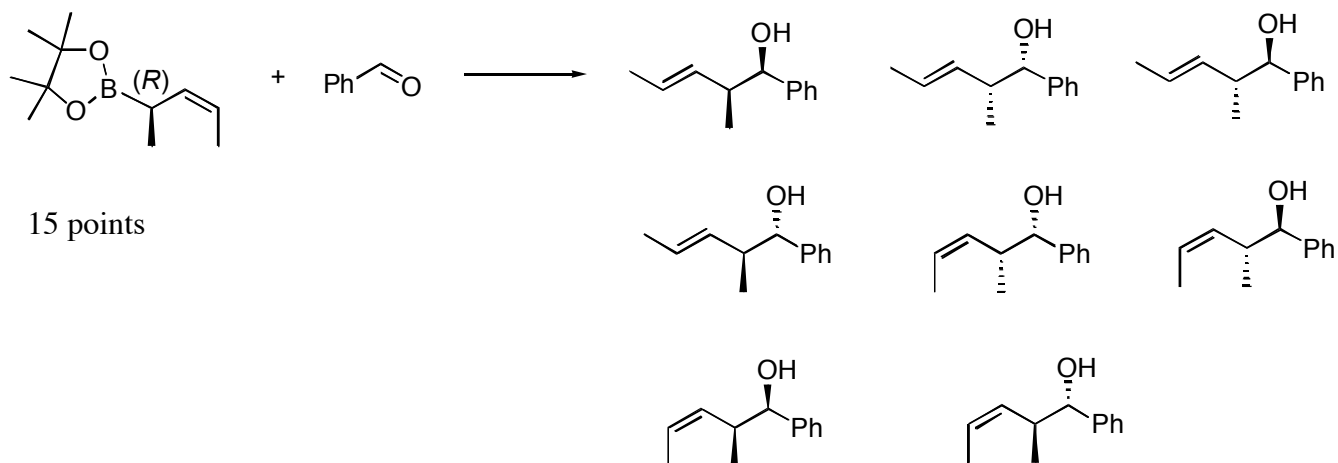


10 points

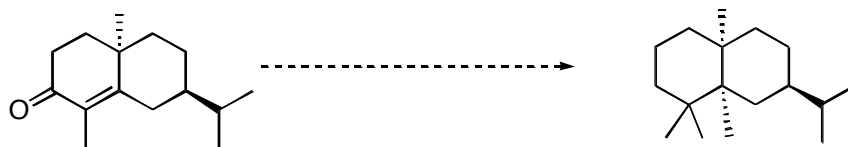
Hint 1: disregard what you wrote in parts (a) and (b) of this question. It is overwhelmed by another effect.

Hint 2: the phenolic hydrogen of **D** is acidic. Recall the effect that Lewis acids have on Diels Alder reactions

4. Circle the correct product. Explain your choice with a carefully drawn analysis of the transition state.

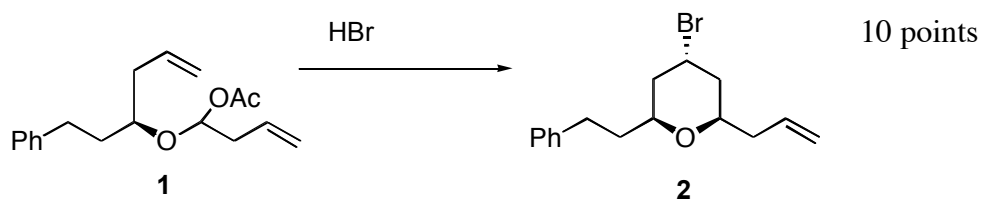


5. Propose a multistep synthesis



15 points

6(a) Propose an arrow pushing mechanism



6(b) When the reaction in 6(a) is carried out with enantiomerically enriched **1**, the product **2** that is obtained is nearly racemic. Propose an explanation

12 points

