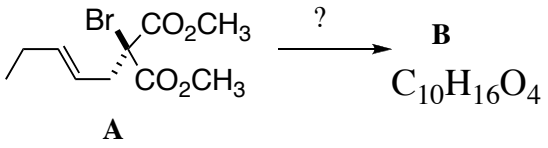
Chem 331
Exam #4
Friday, December 14, 2007

Name _____

This is an open-book, open notes exam. Please show your work in detail.

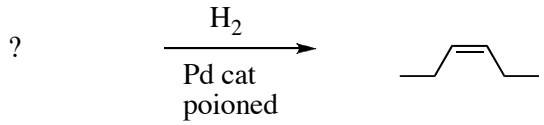
1. (20 points) Deduce the structure of **B**, and fill in the missing reagent(s). You do not need to show mechanisms.

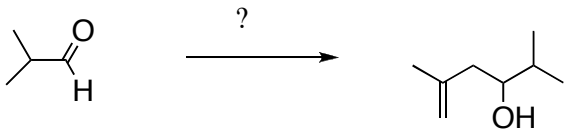


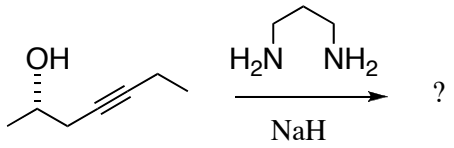
A

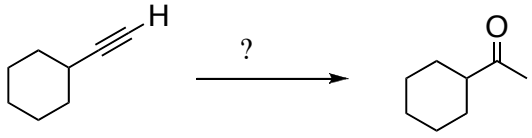
^{13}C NMR:	**^{1}H NMR:**
169.2, s (2)	5.56, ddd, J = 15.2, 6.8, 5.1 Hz, 1H
135.5, d	5.34, ddd, J= 15.2, 7.2, 5.2, Hz, 1H
123.9, d	3.73, s, 6H
52.4, q (2)	3.41, t, J = 7.6 Hz, 1H
52.0,d	2.58, m. 2H
31.9, t	1.9 - 2.1, m, 2H
25.6, t	0.94, t, J = 7.1 Hz, 3H
13.8, q	

2. (20 points) Fill in the missing starting material, reagent or product.

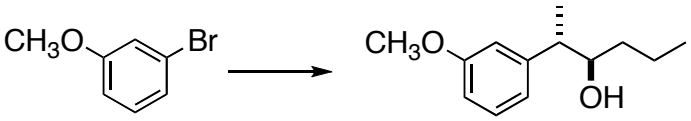
a. 

b. 

c. 

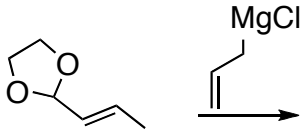
d. 

3. (20 points) Outline a synthesis of **D** from **C**. You may use any piece that contributes three or fewer carbons to the final product. Absolute configuration is not important, but relative configuration is.



C **D**

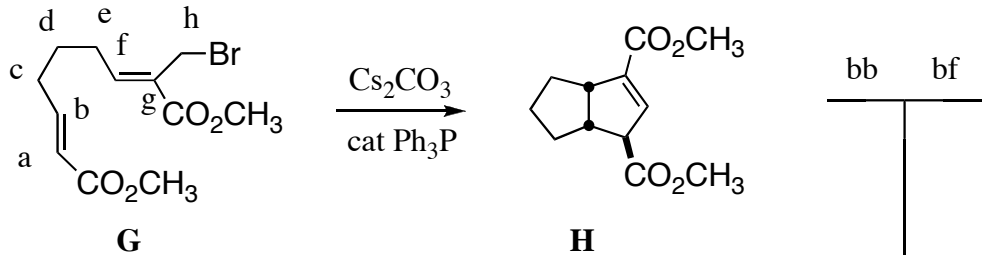
4. (20 points) Deduce the structure of **F**, and draw an arrow-pushing mechanism for the transformation.



E **F** $C_9H_{16}O_2$

^{13}C NMR:	**^{1}H NMR:**
144.9, d	6.26 d, J = 12.9 Hz, 1H
137.1, d	5.84-5.69 m, 1H
115.7, t	5.04-4.95 m, 2H
110.6, d	4.73 dd, J = 12.9, 8.4 Hz, 1H
70.1, t	3.85-3.73 m, 4H
61.4, t	2.2 bs, 1H (exchanges)
42.3, t	1.9 - 2.1 m, 3H
32.7, d	1.00 d, J = 6.6 Hz, 3H
21.2, q	

5. (20 points) Draw a detailed arrow-pushing mechanism for the transformation of **G** to **H**. 5 points for correctly labelling **H**.



G **H**

bb bf