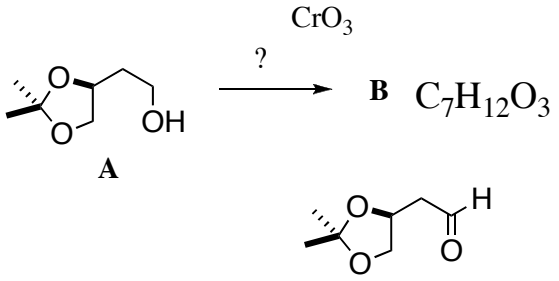
Chem 331
Exam #3
Friday, November 16, 2007

Name _____

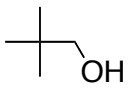
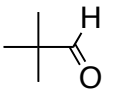
This is an open-book, open notes exam. Please show your work in detail.

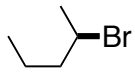
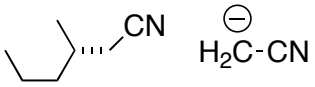
1. (20 points) Deduce the structure of **B**, and fill in the missing reagent(s). You do not need to show mechanisms.

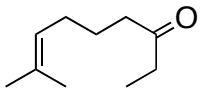
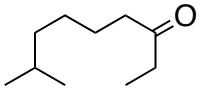


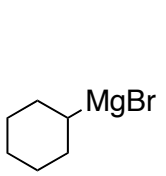
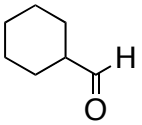
^{13}C NMR:	**^{1}H NMR:**
200.0, d	9.80 dd, 1H, J = 1.2, 2.0
109.2, s	4.55 tt, 1H, J = 6.0, 6.8
70.6, d	4.18 dd, 1H, J = 6.0; 8.4
69.1, t	3.58 dd, 1H, J = 6.8, 8.4
47.8, t	2.85 ddd, 1H, J = 2.0, 6.8, 17.2
26.8, q	2.65 ddd, 1H, J = 1.2, 6.0, 17.2
25.4, q	1.41 s, 3H
	1.36 s, 3H

3. (20 points) Fill in the missing starting material, reagent or product.

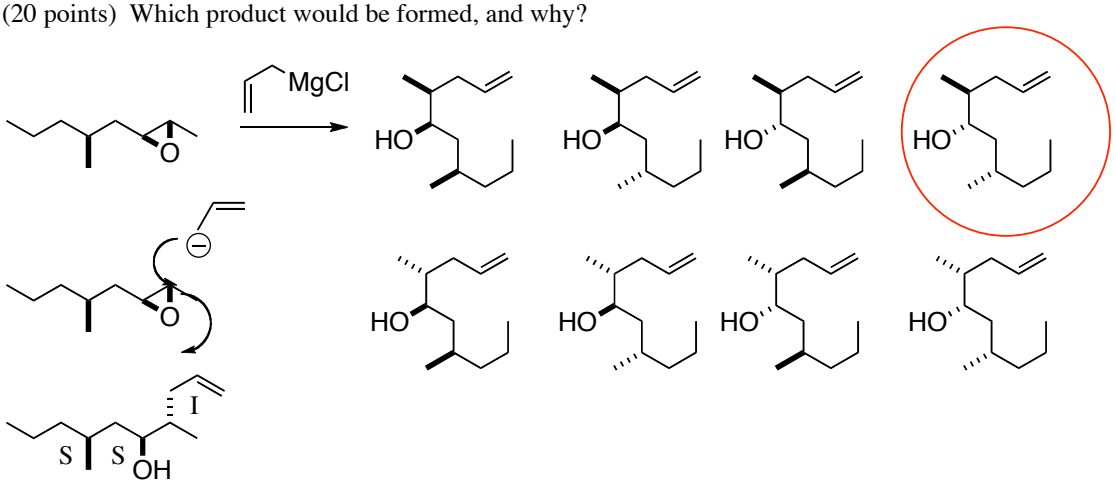
a. ? $\xrightarrow{NaBH_4}$  

b.  $\xrightarrow{?}$ 

c.  $\xrightarrow{?}$  H_2, Pd cat

d.  $\xrightarrow[\text{(then work up)}]{}$? $C_7H_{12}O$ 

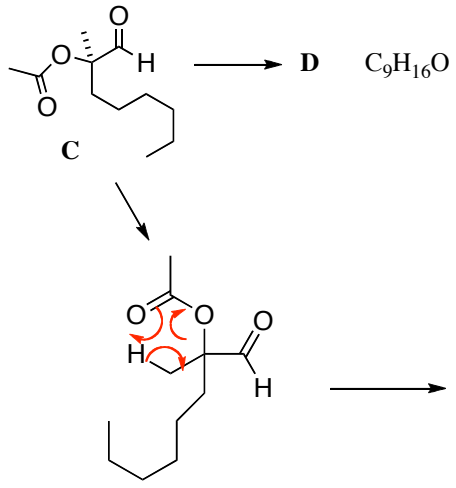
3. (20 points) Which product would be formed, and why?



S = same

I= inverted

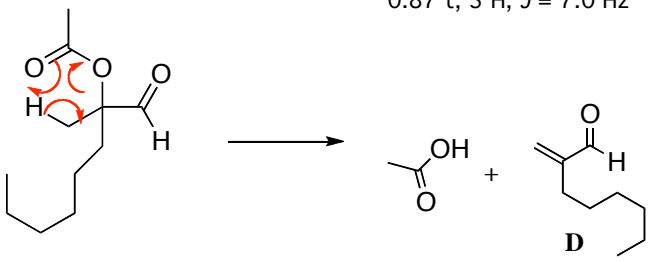
4. (20 points) Deduce the stucture of **D**, and draw an arrow-pushing mechanism for the transformation.



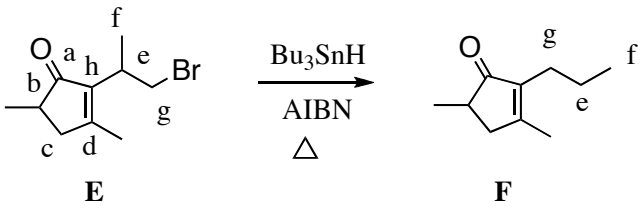
D $C_9H_{16}O$

^{1}H NMR:
9.48 s, 1H
6.19 s, 1H
5.93 s, 1H
2.18 t, 2H, *J* = 7.6 Hz
1.2-1.5 br m, 8 H
0.87 t, 3 H, *J* = 7.0 Hz

^{13}C NMR:
194.6, d
150.4, s
133.7, t
31.5, t
28.8, t
27.7, t
27.6, t
22.4, t
13.9, q



5. (20 points) Draw a detailed arrow-pushing mechanism for the transformation of **E** to **F**.



E **F**

bb	bf
Sn-H	Sn-Br
g-Br	e-H
h-e	h-g