Chem 333
Fall 2012
Exam #1
October 1, 2012

Name_____

1. (20 points) $C_6H_{13}Br$

43.4, d
39.2, t
25.2, t (2)
11.6, q (2)

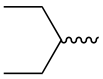
1. IHD = 0

all H's on C

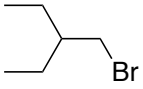
2. IHD = 0

3. There is a Br attached. Br has an alpha shift of + 20, so -CH_2-Br, 39.2, t

4. There are symmetrical CH_2's and CH_3's, so



5. Putting it all together:



2. (40 points) $C_7H_{14}O_2$

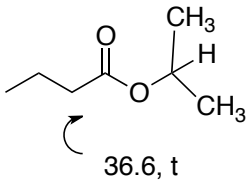
171.3, s
67.3, d
36.6, t
21.9, q (2)
18.6, t
13.6, q

1. IHD = 1

all H's attached to C

2. IHD = 1

171.3, singlet suggests a carboxylic acid derivative. Since all H's are on C, and the only other heteroatom is an O, this must be an ester:



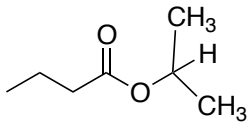
the alpha shift for -OCOR is + 45, so 67.3, d

The symmetrical methyls must be on this same C-H, since it is the only branch point in the molecule

3. No more heteroatoms

4. No more pieces

5. Putting it all together



3. (40 points) $C_7H_{12}O$

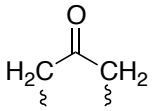
211.8, s
50.0, t
41.1, t
34.2, d
33.3, t
25.3, t
22.1, q

1. IHD = 2

All H's on carbon

2. IHD = 2

211.8, s suggests a ketone, a carbonyl flanked by two carbons. From 41.1, t and 50.0, these must both be CH_2's



note: no symmetry

There is still one more IHD. There are no alkene carbons (100-160), so it must be a ring. There is one branch point, so it must a ring with one branch coming off

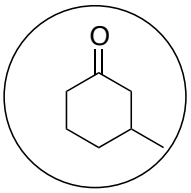
3. No more heteroatoms

4. One methyl group

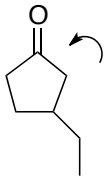
two more CH_2's

One C-H

5. Putting it all together



or



this carbonyl would come at 220
see p. 252