Homework 6

Problems 1-5. Consider the NMR of ethanol CH_3CH_2OH

1. The C-13 coupled spectrum will show a _____ for the CH_2 (methylene) group.

   a) singlet b) doublet **c) triplet** d) quartet e) multiplet

2. In the proton spectrum from the highest chemical shift to the lowest, the integration of the peaks will be:

   a) 1, 2, 3 b) 1, 1, 1 c) 3, 2, 1 d) 0, 4, 3 e) 2, 3, 1

3. In the proton spectrum, the peaks from highest to lowest chemical shift will be:

   a) singlet, doublet, triplet
   b) singlet, quartet, triplet
   c) singlet, triplet, quartet
   d) triplet, quartet doublet
   e) quartet, triplet singlet

4. In the **coupled** carbon spectrum, the peaks from highest to lowest chemical shift will be:

   a) singlet, doublet, triplet
   b) singlet, singlet
   c) triplet, quartet
   d) triplet, quartet, doublet
   e) quartet, triplet, singlet

5. The normal (decoupled) carbon-13 spectrum will consist of _____ different peaks.

   a) 1 **b) 2** c) 3 d) 6 e) more than 6

6. On a 60 MHz instrument, 0.50 ppm in the proton spectrum corresponds to _____ Hz. On the same instrument C-13 is run at a frequency of 15 MHz. On its spectrum, 0.50 ppm corresponds to _____ Hz.

   a) 60, 15 b) 15, 15 c) 7.5, 7.5 d) 7.5, 30 **e) 30, 7.5**