Organic II Lecture
Fall 2002
Quiz #1
(10 points)

1. Using a 60 MHz spectrometer, a chemist observes the following absorption. (Homework problem 13-37)

   Doublet, J = 7 Hz, at \( \delta \) 4.00

   a) How many hertz from the TMS peak is this absorption? (1 point)

   b) In ppm units, where would this peak appear using a 300 MHz NMR? (1 point)

   c) What would be the J value for the doublet in the 300 MHz spectrum? (1 point)

2. Provide a molecular formula for the compound depicted in the following mass spectrum. (2 points)

- Turn page over -
3. Using the structure below, answer the following questions.

\[
\begin{align*}
\text{H} & \quad \text{H} & \quad \text{O} \\
\text{H} & \quad \text{C} & \quad \text{C} & \quad \text{H} \\
\text{H} & \quad \text{C} & \quad \text{C} & \quad \text{H} \\
\text{H} & \quad \text{O} & \quad \text{C} & \quad \text{H} \\
\end{align*}
\]

a) How many different \( ^1H \) chemical environments are represented? (2 points)

b) Predict the splitting pattern of each type of proton. (2 points)

c) Indicate the chemical shift range (ppm) of the peak occurring farthest downfield. (1 point)