1. Given the following structure, answer the questions below:

a. How many carbon-13 signals should you see for this compound? (1 pt) What would their splitting patterns be? (3 pts)

b. How many proton signals should you see for this compound? (1 pt) What would their splitting patterns be? (3 pts)
2. If you have a compound which is 69.8% C, 11.6% H and given the following spectral information, answer the questions below.

**MS**

**IR**

$^1$H NMR
a. What is the molecular formula of this compound? How did you use the MS to help you with this? What are the units of unsaturation? (4 pts)

b. What information have you gotten from the IR spectrum? Give frequencies and what they told you about the compound. (3 pts)

c. What information does the $^{13}$C spectrum give you? What about the DEPT? What can you tell about your compound? Give details (chemical shift, what the signals in the DEPT spectrum are telling you, etc.). (4 pts)
d. What information does the $^1$H NMR give you? Give details like chemical shift, coupling patterns, integrations and your interpretation of these items. Remember, the data is nice, the interpretation shows you are thinking. (4 pts)

e. Given all the information above, give a reasonable prediction of the structure of this compound. (2 pts)