

Suggested Answers

NAME

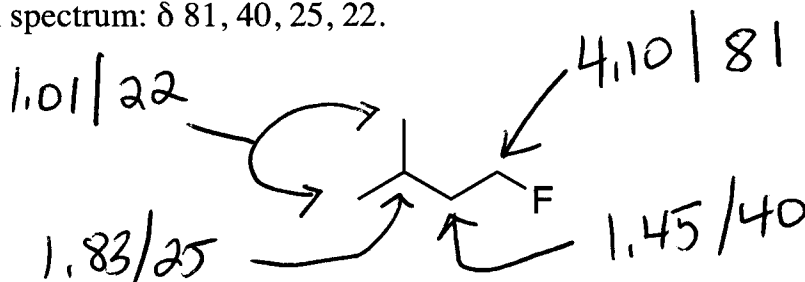
SIGNATURE

Interpretation of  $^{13}\text{C}$  and  $^1\text{H}$  NMR Spectra

1) Assign all the resonances for the  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra of the following compound and explain how you made each assignment (3 points).

$^1\text{H}$  NMR spectrum:  $\delta$  4.10 (t, 2 H), 1.83 (m, 1 H), 1.45 (q, 2 H), 1.01 (d, 6 H).

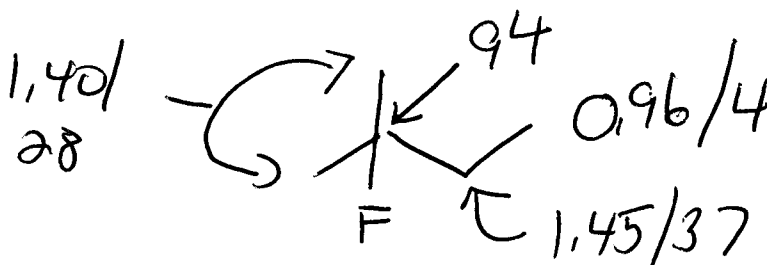
$^{13}\text{C}$  NMR spectrum:  $\delta$  81, 40, 25, 22.



2) An *isomer* of the compound in (1) exhibits the following spectra. Show the structure and explain how you assigned it from the data (3 points).

$^1\text{H}$  NMR spectrum:  $\delta$  1.45 (q, 2 H), 1.40 (s, 6 H), 0.96 (t, 3 H).

$^{13}\text{C}$  NMR spectrum:  $\delta$  94, 37, 28, 4.



3) On the next page are  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra of an unknown:  $\text{C}_4\text{H}_{10}\text{O}$ . What is its structure and how did you decide? (4 points)

