Answers to Problem 75, Chemistry 301X - 2006

To the experienced NMR maven, that quartet at $\delta = 3.7$ and the triplet at $\delta = 1.2$ are a certain diagnostic of an OCH_2CH_3 group. You may have to get out your chemical shift chart and figure out coupling to be certain, but the pattern is a dead giveaway, and you might as well learn to recognize it.

So, compounds (a) and (c) are out (also for many other reasons). There is no signal in the spectrum for the ethyl group of compound (b), so, although the OCH_2CH_3 is there it must be rejected. In compound (d) there is only one other H (would appear as a singlet) besides the OCH_2CH_3, so this one must be wrong also. That leaves (e), which fits the spectrum perfectly.

There are also four different carbons, as the ^{13}C spectrum shows. Can you assign that spectrum?