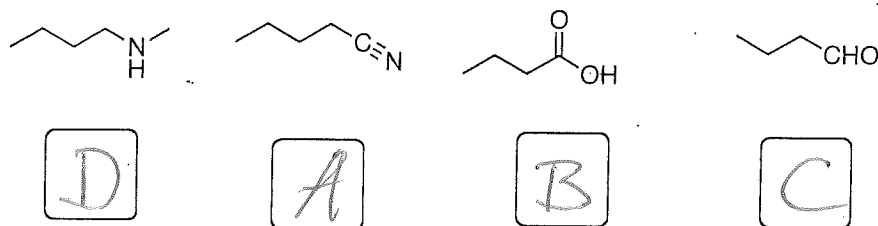
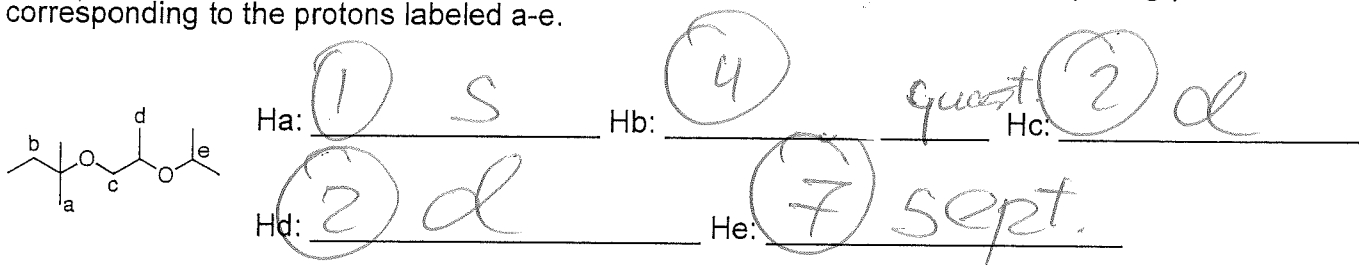


1. (8 pts) The compounds below were identified by IR spectroscopy. The following characteristic absorptions were obtained. Compound A: 2247 cm^{-1} (medium intensity). Compound B: two signals: 3002 cm^{-1} (strong intensity, broad) and 1722 cm^{-1} (strong intensity). Compound C: 1731 cm^{-1} (strong intensity). Compound D: 3326 cm^{-1} (medium intensity, broad). Assign these spectroscopic data by placing A, B, C, or D into the boxes.



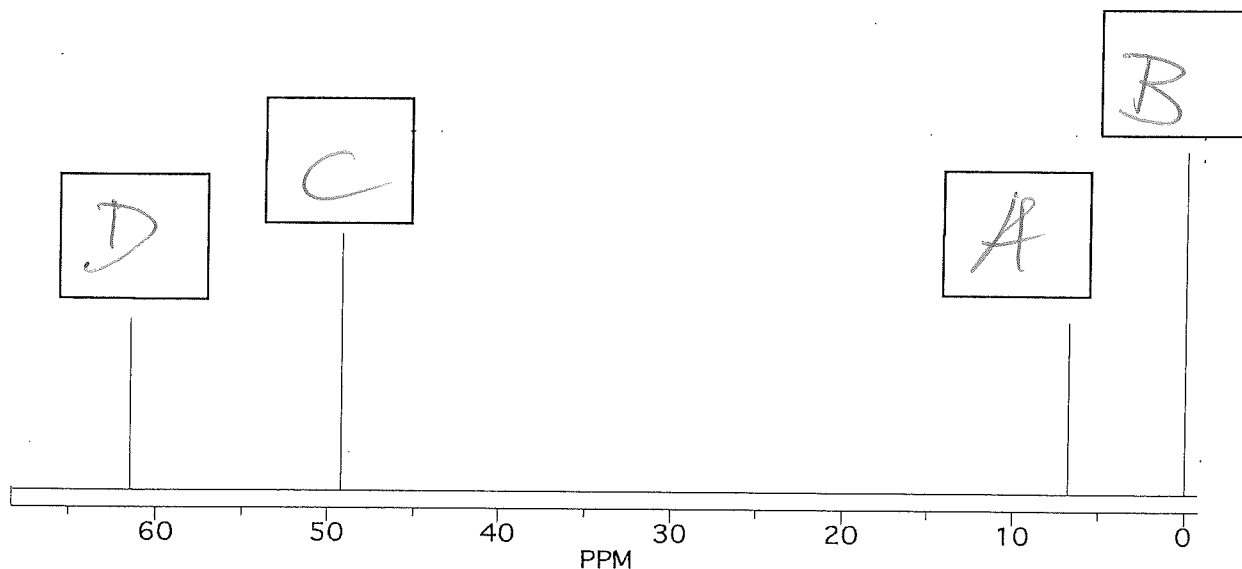
2. (5 pts) For the ^1H NMR spectrum of compound shown below, predict the splitting pattern of the signals corresponding to the protons labeled a-e.



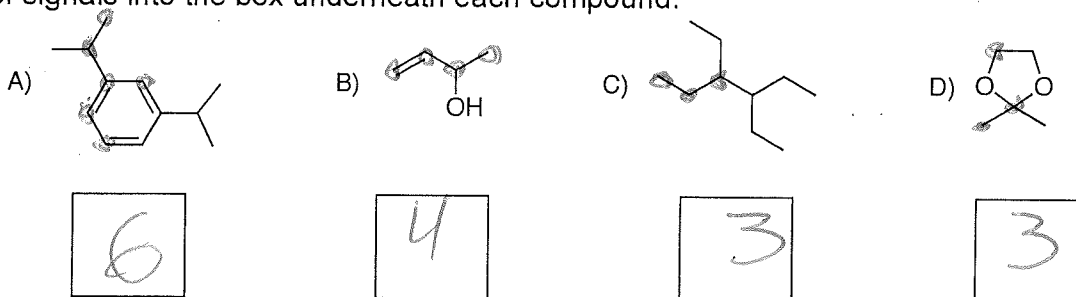
3. (4 pts) A sample whose ^{13}C NMR spectrum is shown below contains equimolar amounts of the following compounds:



Assign the peaks in the ^{13}C NMR spectrum by placing A, B, C or D into the appropriate boxes.



4. (4 pts) How many signal would you expect in the ^{13}C NMR spectrum of the following compounds? Write the number of signals into the box underneath each compound.



5. (4 pts) Refer to the ^1H NMR spectrum of ethyl isobutyrate shown below. Clearly assign all signals by writing their approximate chemical shifts into the appropriate box.

