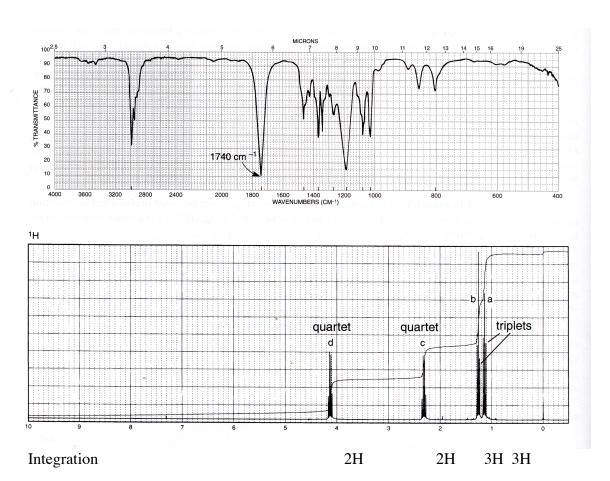
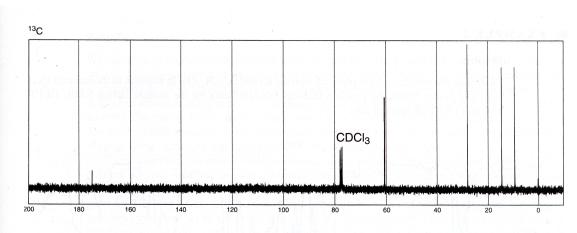
Spring 2016 Due: 04/01/16

## FEEL FREE TO PRINT THIS PAGE AND WRITE YOUR ANSWERS ON THIS SHEET

1. Determine the structure of a compound with the formula C<sub>5</sub>H<sub>10</sub>O<sub>2</sub> given the IR, <sup>1</sup>H-NMR, and <sup>13</sup>C-NMR provided below. Assign the appropriate peaks in the IR and NMR spectra (on the spectra below) and providing a short narrative (on the following page) describing what structural information each piece of data provided..



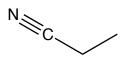


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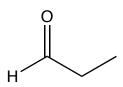
2. Provide the products produced from each of the following reactions.

a)



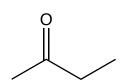
1) CH<sub>3</sub>CH<sub>2</sub>Li 2) HCl

b)



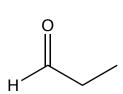
1) CH<sub>3</sub>MgBr

c)



1) NaBH<sub>4</sub>

d)



1) NaCN 2) HCl, H<sub>2</sub>O ➤

e)

1) NaC = CCH<sub>2</sub>CH<sub>3</sub> >