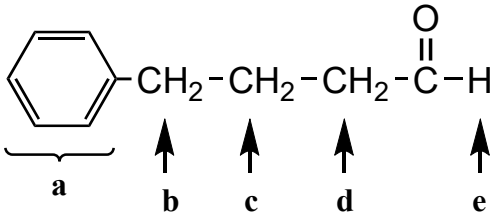
CHM 3150L Organic Laboratory, Dr. Laurie S. Starkey
NMR Problem Set #1: Predicting IR and ^{1}H NMR Spectra

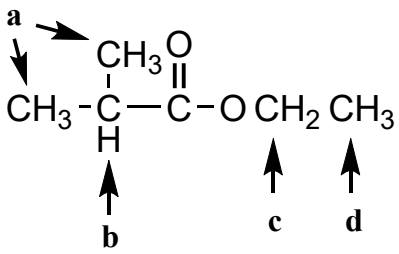
Name:_____

For each of the following molecules, predict what you would find in its IR spectrum and its ^{1}H NMR spectrum. For the IR, list the significant peaks which are expected, and indicate which functional group is responsible for that peak (e.g., O-H stretch around 3300 cm^{-1}). For the ^{1}H NMR, each unique type of proton has already been indicated (a, b, etc.). For each signal, determine how many H's (peak integration) and what the splitting pattern would be, and then estimate and/or calculate the expected chemical shift (δ value in ppm, **show your work**).



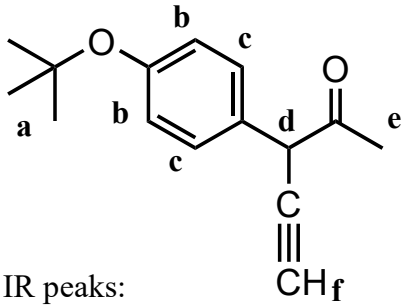
proton	#H, split	δ (ppm)
a	5H, singlet	~ 7ppm (aromatic)
b	2H, triplet	~ 2.3 ppm (benzylic) *or calculate* δ = 1.2 + 1.4 (Ar) + 0.0 (R) = 2.6 ppm
c		
d		
e		

IR peaks:



proton	#H, split	δ (ppm)
a		
b		
c		
d		

IR peaks:



proton	#H, split	δ (ppm)
a		
b		
c		
d		
e		
f		

IR peaks: