1. (40 pts) On the second page of this problem set is a tandem mass spectrum of an unknown peptide that was acquired using collision-induced dissociation (CID) on a quadrupole ion trap. The m/z ratio of the precursor ion is 434.6. It is a doubly-charged ion. Determine the amino acid sequence of this peptide. Also, please label each peak that has a relative abundance above 10% with the standard product ion nomenclature.

2. (40 pts) On the third page of this problem set is a tandem mass spectrum of an unknown peptide that was acquired using collision-induced dissociation (CID) on a quadrupole ion trap. The m/z ratio of the precursor ion is 524.4. It is a doubly-charged ion. Determine the amino acid sequence of this peptide. The fourth page of the problem set also shows expanded regions of the spectrum on page 3. Please label each peak that has a relative abundance above 10% with the standard product ion nomenclature.

3. (20 pts) There is a text file on-line that contains a list of measured m/z ratios that were obtained by doing MALDI-MS on the digest of an unknown protein. Using one of the peptide mass fingerprinting servers indicated in class (i.e. MS-Fit, PROWL, etc.), determine the identity of the protein that gives rise to these m/z ratios. Assume the following about your measurement:

- Mass tolerance of 50 ppm
- Cysteines were alkylated with iodoacetamide, so that they are carbamidomethylated
- Oxidation can occur at methionine residues

Please make sure to include a print-out of the results from the protein identification using one of the on-line servers.

**Important Note 1:** You are to work on this problem set by yourself. You are welcome to use any resource you want EXCEPT for another person in the class. *If you need help, then please ask me.*

**Important Note 2:** This problem set is due *Friday April 15, 2016*. Any problem set turned in late will be subject to a 25% penalty for each day that it is late.
CID spectrum for problem #1
Precursor ion was m/z 434.6 (M+2H)^2+
CID spectrum for problem #2
Precursor ion was m/z 524.4 (M+2H)^2+
Expanded regions for spectrum associated with question #2