HW 4 Phys 3446

1.) a) Use Equation 2.3 to compute the total binding energy and the binding energy per Nucleon for $^{8}BE^{4}$, $^{12}C^{6}$ and $^{56}FE^{26}$

2) From the previous problem , one might conclude that $^{8}BE^{4}$ is stable, but it's not; can you explain this (hint see problem 2.2).

3) Calculate the binding energy of the last neutron in $^{15}N^{7}$ and of the last proton in $^{15}O^{8}$, and contrast with the last neutron in $^{16}N^{7}$ and $^{16}O^{8}$.

4) Calculate the Q values for the following α-decays between Ground state levels of the nuclei (a) $^{208}Po^{82}$ -> $^{204}Pb^{80}$ and for (b) ^{243}Am-> ? (b) Is this the Americium isotope used in smoke detectors? C) What is the atomic mass of Americium? (d) For parts a+b What are the kinetic energies of the α-particles and of the nuclei in the final state if the decays proceed from rest?

5) Book problem 4.4

6) Book problem 4.6