Homework #8 ; Due Wed. 4/15

1. Use Appendix 8 to determine the total energy released when ^{14}C beta-decays. (The table gives the mass of the neutral atom, not the mass of the nucleus.)

2. Table 12.3 lists four "parent" nuclei that decay into four different "end products". For each of the four cases, calculate the total number of alpha- and beta (minus) decays. (Assume that the entire decay chain is due to these to decays only). (Hint: the answer to the first one can be gleaned from a nearby figure.)

3. Chapter 13, Problem 26. (Same in both 3rd and 4th editions)

4. The isotope ^{18}F is used in medicine. If you want a patient to have 10^8 atoms of ^{18}F in their body 24 hours after it is injested, what activity should the patient ingest (24 hours earlier)? (The half-life is 110 minutes.) Give answer in Curies.

5. A radioactive chunk of material has an activity of 1.4mCi at Noon, and an activity of 0.25mCi at 1pm.

A) What is the half-life?

B) Deduce the **number** of radioactive atoms that remain at 2pm. (Not the activity!)