**IB Physics**

**FA 30.1 - Radioactive Decay**

Name

What you will miss least about TuHS

**Show your work, circle your answers, and use sig figs to receive full credit.**

1 u = 1.6605x10-27 kg = 931.5 MeV, 10n = 1.008665 u

1. Find the missing particle or nucleus in these decays: (These are fictitious - ignore neutrinos for now)

|  |  |  |  |
| --- | --- | --- | --- |
| 8339Y →  7937Rb | → 4922Ti   4921Sc | 5024Cr→5023V   β+ | 5426Fe→  5426Fe |

2. What is the kinetic energy of the alpha particle that 208Po (m = 207.981222 u) gives off becoming 204Pb (m = 203.973020) in MeV?

3. Imagine it is possible for undergo both β- and β+ decay. Write the complete decay equation below for each (complete with neutrino or anti-neutrino)

→ + β- +

→ + β+ + υe

4. You have 24.0 grams of a radioactive substance with a half life of 14.0 minutes. In what time will you have 3.00 grams of it left?

5.The activity of a sample with a half-life of 23.5 minutes is initially 3.412x106 counts/second. What will it be in 6.00 hours?

If K-40(m = 39.964 u) had a half life of 14.0 hours, (It's actually stable) what would be the activity of 0.0240 grams of it?