CHEM105H Announced Quiz 2 ***Name on back only please……***

You must show all equations, all rearrangements of equations, and all work to receive any credit

1. Write the balanced nuclear equation for:

    a. An electron capture by a calcium-41 nucleus.

    b. A positron emission from a krypton-74 nucleus

    c. The expected radioactive decay of a copper-62 nucleus

    d. The expected radioactive decay of a radon-222 nucleus

2. Cobalt-67 has a half-life of 5.3 years. Calculate the number of days required for 20% of a 10.43 g sample of Cobalt-67 to decay.

3. When positrons are ejected from a radioactive nucleus, they each immediately collide with an electron and the two particles turn completely into electromagnetic radiation energy via a pair annihilation process producing two photons for each electron-positron pair annihilated. Calculate, in MeV, the energy of each of the two generated photons.

    1 amu = 1.6605 x 10^{-27} kg, 1 MeV = 1.602 x 10^{-13} J

    Electron Mass = Positron Mass = 9.109 x 10^{-31} kg