

Physics 225b Test 2 (Show your work!) Name:

$$E_{bind} = 15.6A - 16.8A^{2/3} - 0.72\frac{Z^2}{A^{1/3}} - 23.3\frac{(A - 2Z)^2}{A} + \frac{\delta}{A^{3/4}} \quad \left\{ \begin{array}{l} \delta = \\ 34(\text{even-even}) \\ -34(\text{odd-odd}) \\ 0(\text{even} \leftrightarrow \text{odd}) \end{array} \right\}$$

$$N(t) = N_0 e^{-\lambda t}, \quad R = \phi \sigma \frac{m}{M} N_A, \quad N_A = 6.02 \times 10^{23}, \quad I(x) = I_0 e^{-n\sigma x}$$

$$N(t) = \frac{R}{\lambda} (1 - e^{-\lambda t}), \quad E = mc^2, \quad hc = 1240 \text{ MeV fm}, \quad \frac{Ke^2}{\hbar c} = 1/137, \quad e = 1.6 \times 10^{-19} \text{ C}$$

$$\lambda = \frac{v}{2R} e^{-2kL}, \quad k = \sqrt{(2m/\hbar^2)(U_0 - E)}, \quad R = 1.4 \text{ fm} A^{1/3}, \quad R_{turning} = 2k(Z - 2)e^2 / E_{kinetic}$$