PS 303 — Modern Physics — Test #2

Name _____ Score: ____/100 Total points: ____/____

Approximate grade ____

Relax. Look over all questions before you begin, and attempt the easier ones first. Place your answers in the boxes provided. To receive full credit you must SHOW your work and EXPLAIN your method. You may work on the back of each sheet.

$$t = \gamma_r \left(t' + \beta_r \frac{x'}{c} \right) \quad \frac{x}{c} = \gamma_r \left(\beta_r t' + \frac{x'}{c} \right) \quad (\Delta t)^2 - \frac{(\Delta x)^2}{c^2} = (\Delta t')^2 - \frac{(\Delta x')^2}{c^2}$$

$$r_n = \left(\frac{4\pi\epsilon_0 \hbar^2}{m_e Z e^2} \right) n^2 \quad v_n^2 r_n = \frac{1}{4\pi\epsilon_0} \frac{Ze^2}{m_e} \quad E_n = -\left(\frac{m_e Z^2 e^4}{32\pi^2 \epsilon_0^2 \hbar^2} \right) \frac{1}{n^2} \quad E = h\nu \quad p = \frac{h}{\lambda}$$

$$E = \gamma m c^2 \quad \vec{p} = \gamma m \vec{v} \quad E^2 = p^2 c^2 + (mc^2)^2 \quad v_x = \frac{u + v_x'}{1 + \frac{u v_x'}{c^2}} \quad N = N_0 e^{-\lambda t}$$
