5. With $m_p = 1.67 \times 10^{-27}$ kg, we obtain

$$E_1 = \left(\frac{h^2}{8mL^2}\right) n^2 = \left(\frac{(6.63 \times 10^{-34}\,\mathrm{J\cdot s})^2}{8m_p(100\ \times 10^{12}\,\mathrm{m})^2}\right)(1)^2 = 3.29 \times 10^{-21}\,\mathrm{J} = 0.0206\ \mathrm{eV}\ .$$

Alternatively, we can use the $mc^2$ value for a proton from Table 38-3 ($938 \times 10^6\,\mathrm{eV}$) and the $hc = 1240\,\mathrm{eV\cdot nm}$ value developed in problem 3 of Chapter 39 by writing Eq. 40-4 as

$$E_n = \frac{n^2h^2}{8mL^2} = \frac{n^2(hc)^2}{8(m_pc^2)L^2}\ .$$

This alternative approach is perhaps easier to plug into, but it is recommended that both approaches be tried to find which is most convenient.