

75. (a) The work done by the battery relates to the potential energy change:

$$q\Delta V = eV = e(12\text{ V}) = 12\text{ eV} = (12\text{ eV})(1.6 \times 10^{-19}\text{ J/eV}) = 1.9 \times 10^{-18}\text{ J} .$$

(b)  $P = iV = neV = (3.4 \times 10^{18}/\text{s})(1.6 \times 10^{-19}\text{ C})(12\text{ V}) = 6.5\text{ W}.$