

32. We use  $E = q/4\pi\epsilon_0 R^2 = V/R$ . Thus

$$u = \frac{1}{2}\epsilon_0 E^2 = \frac{1}{2}\epsilon_0 \left(\frac{V}{R}\right)^2 = \frac{1}{2} \left(8.85 \times 10^{-12} \frac{\text{C}^2}{\text{N} \cdot \text{m}^2}\right) \left(\frac{8000 \text{ V}}{0.050 \text{ m}}\right)^2 = 0.11 \text{ J/m}^3.$$