P #43 Ch 16 - pg 526

- Find C: $A = 2.00\ cm^2 \left(\frac{1\ m}{100\ cm}\right)^2 = 2.00 \times 10^{-4}\ m^2$

$d = 5.00\ mm = 5.00 \times 10^{-3}\ m$

$\varepsilon_0 = 8.85 \times 10^{-12}\ C^2/N \cdot m^2$

$$C = \frac{\varepsilon_0 \cdot A}{d} = \frac{(8.85 \times 10^{-12}\ C^2/N \cdot m^2)(2.00 \times 10^{-4}\ m^2)}{(5.00 \times 10^{-3}\ m)}$$

$$C = 3.54 \times 10^{-13}\ F$$

Find U: $U = \frac{1}{2} \cdot C \cdot V^2$

$$= \frac{1}{2} \cdot (3.54 \times 10^{-13}\ F)(12\ V)^2$$

$$\boxed{U = 2.55 \times 10^{-11}\ J}$$