P # 25

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$d = 1.80\ mm = .0018\ m$

$A = 7.60\ cm^2 \cdot \left(\frac{1\ m}{100\ cm}\right)^2 = 7.6 \times 10^{-4}\ m^2$

$V = 20.0\ V$

a) $E = \frac{V}{d}$

$= \frac{(20.0\ V)}{.0018\ m}$

$\boxed{E = 1.11 \times 10^4\ N/C}$

b) $C = \frac{\varepsilon_0 \cdot A}{d}$

$= \frac{(8.85 \times 10^{-12}\ C^2/N \cdot m^2)(7.6 \times 10^{-4}\ m^2)}{(.0018\ m)}$

$\boxed{C = 3.74 \times 10^{-12}\ F}$

c) $C = \frac{Q}{V}$ so $3.74 \times 10^{-12}\ F = \frac{Q}{20\ V}$

$\boxed{Q = 7.47 \times 10^{-11}\ C}$