

3-1)

$$A) \ C = \frac{\epsilon_0 A}{d} = \frac{9 \times 10^{-12} (0.15)^2}{2.5 \times 10^{-3}} = 8.1 \times 10^{-11} \text{ F}$$

$$B) \ V = \frac{Q}{C} = \frac{20 \times 10^{-9}}{8.1 \times 10^{-11}} = 246.9 \text{ Volts}$$

$$C) \ E = \frac{V}{d} = \frac{246.9}{2.5 \times 10^{-3}} = 98,760 \frac{\text{N}}{\text{C}}$$

$$D) \ C = \frac{\kappa \epsilon_0 A}{d} = \frac{(1.7) 9 \times 10^{-12} (0.15)^2}{2.5 \times 10^{-3}} = 1.38 \times 10^{-10} \text{ F}$$

$$E) \ V = \frac{Q}{C} = \frac{20 \times 10^{-9}}{1.38 \times 10^{-10}} = 144.9 \text{ Volts}$$

$$F) \ E' = \frac{E_0}{\kappa} = \frac{98,760}{1.7} = 58,094 \frac{\text{N}}{\text{C}}$$