

Question

A parallel plate capacitor has an electric field of 20 N/C and a plate area of 0.5 m². What is the total charge on the capacitor?

Answer

The total charge on the capacitor

$$Q = CU,$$

$$U = Ed,$$

$$C = \frac{\epsilon_0 A}{d},$$

$$Q = \frac{\epsilon_0 A}{d} Ed = \epsilon_0 AE = 8.85 \times 10^{-12} \times 0.5 \times 20 = 88.5 \times 10^{-12} \text{ C} = 88.5 \text{ pC}$$

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