Question

A parallel plate capacitor has an electric field of 20 N/C and a plate area of 0.5 m^2. What is the total charge on the capacitor?

Answer

The total charge on the capacitor

$$Q = CU,$$

$$U = Ed,$$

$$C = \frac{\varepsilon_0 A}{d},$$

$$Q = \frac{\varepsilon_0 A}{d} Ed = \varepsilon_0 AE = 8.85 \times 10^{-12} \times 0.5 \times 20 = 88.5 \times 10^{-12} \text{ C} = 88.5 \text{ pC}$$