

Answer on Question #86939, Physics / Electric Circuits

Given:

$$D = 0.75 \text{ m. } F = 4.8 \times 10^{-16} \text{ N.}$$

To find:

- (a) The magnitude of the electric field at the position of the electron between the plates.
- (b) The potential difference between the plates.

Solution:

(a) Magnitude of electric field at the position of electron between the plates, we use $E = \frac{F}{q}$ where q is an elementary charge carried by single electron and F is the force. The elementary charge is $q = 1.6 \times 10^{-19} \text{ C}$.

Thus,

$$E = \frac{4.8 \times 10^{-16}}{1.6 \times 10^{-19}}$$

$$E = 3000 \text{ N/C}$$

(b) The potential difference between the plates, we multiply the electric field value by the distance between the plates.

$$V = E \cdot D$$

$$V = (3000 \text{ N/C}) \cdot (0.75 \text{ m})$$

$$V = 2250 \text{ V}$$