## Question.

A uniform electric field of 200 N/C is in the x-direction. A point charge of  $3\mu$ C is released from rest at the origin. What is the kinetic energy of the charge when it is at x = 4 m?

a.  $2.4 \times 10 - 2J$ b.  $1.6 \times 10 - 2J$ c.  $3.6 \times 10 - 2J$ d.  $4.8 \times 10 - 2J$ Given:  $E = 200 \frac{N}{C}$   $q = 3 \mu C = 3 \cdot 10^{-6} C$  l = 4 mFind: W = ?

## Solution.

By definition the kinetic energy is:

$$W = F \cdot l$$

We consider that l = 4 m, because the distance from the origin to x = 4 will be 4 meters.

Force, which acts on the charge q by the electric field, is equal to:

$$F = qE$$

So, the kinetic energy of the charge is equal to:

$$W = F \cdot l = q \cdot E \cdot l$$

Calculate:

$$W = 3 \cdot 10^{-6} \cdot 200 \cdot 4 = 2.4 \cdot 10^{-3} I$$

## Answer.

 $W = 2.4 \cdot 10^{-3} J$ 

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