

# PHYS143

## Physics for Engineers

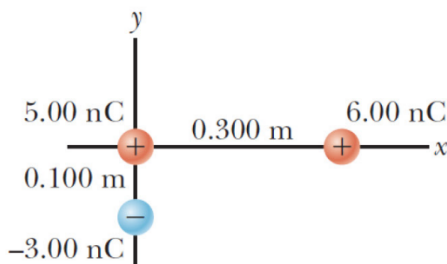
### Tutorial - Chapter 23

#### Question 1

An electron with a speed of  $3.00 \times 10^6$  m/s moves into a uniform electric field of magnitude  $1.00 \times 10^3$  N/C. The field lines are parallel to the electron's velocity and pointing in the same direction as the velocity. How far does the electron travel before it is brought to rest?

#### Question 2

Three point charges are arranged as shown in the Figure. Find (a) the magnitude and (b) the direction of the electric force on the particle at the origin.



#### Question 3

Two  $2.00\text{-}\mu\text{C}$  point charges are located on the  $x$  axis. One is at  $x = 1.00$  m, and the other is at  $x = -1.00$  m. (a) Determine the electric field on the  $y$  axis at  $y = 0.500$  m. (b) Calculate the electric force on a  $(-3.00\text{-}\mu\text{C})$  charge placed on the  $y$  axis at  $y = 0.500$  m.

#### Question 4

A proton accelerates from rest in a uniform electric field of 640 N/C. At one later moment, its speed is 1.20 Mm/s (nonrelativistic because  $v$  is much less than the speed of light). (a) Find the acceleration of the proton. (b) Over what time interval does the proton reach this speed? (c) How far does it move in this time interval?