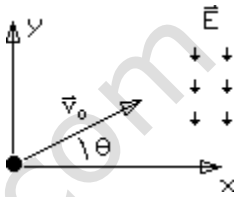
Q- Throughout space there is a uniform electric field in the -*y* direction of strength E = 550 N/C. There is no gravity. At t = 0, a particle with mass m = 2 g charge q = -11 μC is at the origin moving with a velocity v_0 = 45 m/sat an angle θ = 25° above the *x*-axis.

(a) What is the magnitude of the force acting on this particle?

The force on the particle will be

$F = q*E = (-11*10^{-6})*(-550) = 6.05*10^{-3}$ N (in positive y direction)



(b) At t = 6 s, what are the *x*- and *y*-coordinates of the position of the particle?

Initial velocity in x direction will be $v_x = v_0*\cos25^0 = 45*0.906 = 40.78$ m/s

As there is no force and acceleration on the particle in x direction the distance covered will be

$x = v*t = 40.78*6 = 244.7$ m

Initial velocity of the particle in y direction will be $v_y = v_0*\sin25^0 = 45*0.423 = 19.0$ m/s

The acceleration of the particle in + y direction will be $a_y = 6.05*10^{-3}/0.002 = 3.025$ m/s^2

hence the distance covered in y direction in 6 secs will be

$y = v_y*t + ½\ a_y*t^2 = 114 + 54.45 = 168.45$ m