23-04
0.48-39%

Question 472

Three charges +2.00*10**(-8) C, +2.00*10**(-8) C, and -4.00*10**(-8) C are respectively arranged at the corners F, G, and H of a right-angle triangle as shown in figure 2. Find the magnitude and direction of the resultant electric field at point P due to the three charges.

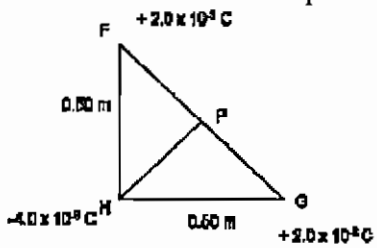


Figure 2

(a) 2.88*10**3 N/C away from H.
(b) 2.88*10**3 N/C towards H.
(c) 5.37*10**3 N/C away from H.
(d) 5.37*10**3 N/C towards H.
(e) 1.09*10**5 N/C towards F.

23-04
0.46-47%

Question 473

In figure 9, a small ball of mass m=2.0 g is hanging from a fixed point by a non-conducting string of length 1.00 m. The ball carries a charge q=25.0*10**(-9) C. The mass of the string is negligible. An electric field E with magnitude E=2.0*10**5 N/C, in the positive x-direction, causes the ball to be in an equilibrium position with an angle Theta. Find the angle Theta. [Take g = 9.80 m/s**2].

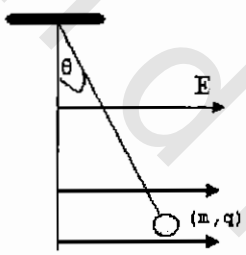


Figure 9

(a) 7.1 degrees.
(b) 14.3 degrees.
(c) 75.7 degrees.
(d) 10.0 degrees.
(e) 0.2 degrees.

## 23-3 A Point Charge in an Electric field

23-08

Question 474

A particle (m =1.0*10**-2 g, q = -4.0 micro C) is moving with a velocity of 20 m/s in the positive x-direction. If the particle enters a uniform electric field of 20 N/C in the positive x-direction, what is the particle's speed after 5.0 s?

(a) 30 m/s , in negative x-direction.
(b) 50 m/s , in negative x-direction.
(c) 30 m/s , in positive x-direction.
(d) 20 m/s , in positive x-direction.
(e) 20 m/s , in negative x-direction.

23-08

Question 475 0.60-53%

An electron enters a region of a uniform electric field directed along the positive x-axis and of magnitude 5 kN/C. The initial velocity of the electron is 10**4 km/s in the positive x direction. What is the speed of the electron 1.5 nano-seconds after entering this region?

(a) 2.1*10**3 km/s
(b) 1.1*10**3 km/s
(c) 2.4*10**4 km/s
(d) 8.7*10**3 km/s
(e) 1.1*10**4 km/s

23-08

Question 476

An electron starts from point P (at t = 0) with an initial velocity vo =(8.6*10**5)i m/s in an electric field E =(4.1*10**3)i N/C. Find the time it takes the electron to return to point P. (i is the unit vector along the positive x-axis.)

(a) 2.4*10**(-9) sec
(b) 1.2*10**(-9) sec
(c) 1.19*10**(-8) sec
(d) 2.4*10**(-8) sec
(e) 3.5*10**(-9) sec

23-08

Question 477

A proton enters a region of uniform electric field (E = 80 N/C) with an initial velocity of 20 km/s directed perpendicularly to the electric field. What is the speed of the proton 2.0 micro-seconds after entering this region?

(a) 25 km/s
(b) 35 km/s
(c) 42 km/s
(d) 4.7 km/s
(e) 15 km/s

23-08

Question 478

An electron, traveling with initial velocity 10**5 i m/s, enters a region of a uniform electric field given by E = 4.0*10**3 i N/C. Determine the time it takes for the electron to come to rest momentarily. (i is a unit vector in the positive x-direction)

(a) It does not come to rest because time would then be negative.
(b) 4.0*10**(-10) s.
(c) 1.4*10**(-10) s.
(d) 2.0*10**(-10) s.
(e) t=0, i.e. it immediately turns to the negative x-direction.

23-08

Question 479 0.41-60%

A proton is shot out along the +x-axis from the origin with a speed of 1.0*10**6 m/s. In this region a uniform electric field of 2500 N/C exits in the negative x-direction. Find the distance traveled by the proton before it momentarily comes to rest.

(a) 8.9 m.
(b) 1.0 m.
(c) 4.2 m.
(d) 2.1 m.
(e) 2.9 m.

23-08

Question 480 0.65-40%

A uniform electric field exists in a region between two oppositely charged plates. An electron, released from rest from the negative plate, strikes the other plate with a speed of 1.2*10**6 m/s, 15 nanoseconds after its release. What is the distance between the plates ?

(a) 2.0 cm
(b) 0.90 cm
(c) 1.4 cm
(d) 1.7 cm
(e) 1.1 cm

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23-08

Question 481 0.39-35%

An electron with an initial velocity of 3.5*10**5 i (m/s) enters a region in which the electric field is 400 i (N/C). What is the speed of the electron two nano-seconds after it enters the electric field ? (i is a unit vector in the x direction)

(a) 3.5*10**5 m/s
(b) 2.8*10**5 m/s
(c) 4.9*10**5 m/s
(d) 2.1*10**5 m/s
(e) 5.6*10**5 m/s

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23-08

Question 482 0.44-67%

A particle of mass 5.0 g and charge 40 mili-C moves in a region of space where the electric field is uniform and given by E = -5.5 i (N/C). If the velocity of the particle at t = 0 is given by v = 50 j (m/s), find the speed of the particle at t = 2 s. [i, and j are the unit vectors in the directions of x, and y respectively].

(a) 150 m/s.
(b) 101 m/s.
(c) 65 m/s.
(d) 34 m/s.
(e) 35 m/s.

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23-08

Question 483 0.60-32%

Two particles of the same mass carrying charges +3Q and -2Q are shot into a region that contains a uniform electric field as in figure 2. The particles have the same initial velocities in the + x direction. The direction of the electric field is as shown. What will be the resulting paths for the particles?

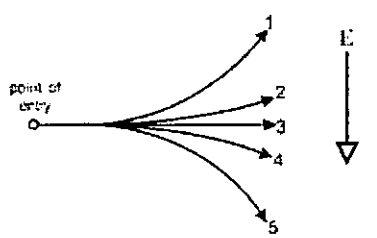


FIGURE 2

(a) path 5 for +3Q and path 2 for -2Q
(b) path 2 for +3Q and path 5 for -2Q
(c) path 1 for +3Q and path 4 for -2Q
(d) path 3 for +3Q and path 2 for -2Q
(e) path 4 for +3Q and path 3 for -2Q

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