HW Questions-Chapter 22 (Dr. Gondal- Phys102)

T042

1) Two positively charged particles q1 and q2 (with q2>q1) are fixed in place on the x-axis at the positions shown in figure 1. A third charge q3 is to be placed somewhere on the x-axis such that the net electrostatic force on q3 is zero. Which one of the following statements is TRUE?

A1 q3 should be placed at a point between q1 and q2 but

2)Two 1.0 g spheres are charged equally and placed 2.0 cm apart. When released, each one begins to accelerate at 225 m/s**2. What is the magnitude of the charge on each sphere?

A1 1.0*10** (-7) C.

T041

Q#1: What is the electric force between two protons which are separated by 1.6*10**(-15) m. (Ans: 90 N, repulsive.)

Q#2: Two positive charges (+8.0 C and +2.0 C) are separated by 300 m. A third charge is placed a distance r from the +8.0 C charge so that the resultant electric force on the third charge due to the other two charges is zero. The distance r is (Ans: 200 m.)

T032

HW☞Q#1: In figure 3, Q = 60 micro-C, q = 20 micro-C, a = 3.0 m, and b = 4.0 m. Calculate the total electric force on q. [i and j are the unit vectors in the positive direction of x-axis and y-axis, respectively].

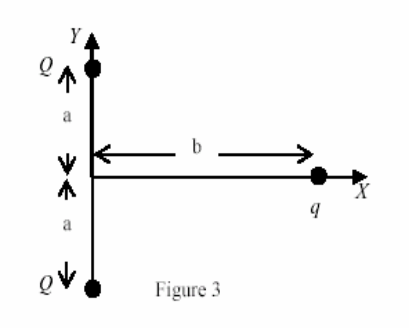

Figure 3

T031

Q#1: As in figure (1), a charge Q is fixed at each of two opposite corners of a square. A charge q is fixed at each of the other two corners. If the resultant electrical force on Q is zero, then Q and q are related as:` (Ans: Q = - 2 Sqrt(2) q)

HW☞Q#2: Consider two identical conductor spheres, A and B. Initially, sphere A has a charge of -80 Q and Sphere B has a charge of +20 Q. If the spheres touched and then are separated by a distance of 0.3 m, what is the resultant force between them? [Take Q = 5.7*10**(-8) C] (Ans: 0.3 N.)

T012

Q#1: Two fixed particles, of charges q1 = + 1.0*10**(-6) C and q2= - 9.0*10**(-6) C, are 10 cm apart. How far from each should a third charge be located so that no net electrostatic force acts on it? (Ans: 5 cm from q1 and 15 cm from)

T011

Q#1: A charge of + 3.2*10**(-6) C is placed at the origin. A second charge (q2) is placed at x= 3.0 m. If a charge of 1.0*10**(-6) C experiences no force if placed at x= 4.0 m, then q2 is: (Ans: + 2.1*10**(-6) C.)

T002

HW☞Q#1: A negative charge is placed at the center of a square. Each corner of the square has a fixed charge of 1.00*10**(-6) C. If the resulting force acting on each charge is zero, the magnitude of the negative charge is: (Ans: 0.96*10**(-6) C.)

Q#2: Two neutral metal sphere are separated by 0.3 km. How much electric charge must be transferred from one sphere to the other so that their electrical attraction is 10**3 N? (Ans: 0.1 C.)

T001

Q#1; A 2.0 micro-C charge is placed at the origin. An identical charge is placed 2.0 m from the origin on the x-axis, and a third identical charge is placed 2 m from the origin on the y-axis. The magnitude of the force on the charge at the origin is: (Ans:1.3*10**(-2) N)

T992

HW☞ Q#2: A 2.0 micro-C charge is placed at the origin. An identical charge is placed 2.0 m from the origin on the x-axis, and a third identical charge is placed 2 m from the origin on the y-axis. The magnitude of the force on the charge at the origin is: (Ans: 1.3*10**(-2) N)

Q#3: 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) (Ans: 1.4*10**(-10) s.)

Final-032

Q#1: In figure (1), if Q = 30 micro-C, q = 5.0 micro-C and d = 0.3 m, find the net force on q. [i and j are the unit vectors in the positive direction of x-axis and y-axis, respectively]. (Ans: zero)

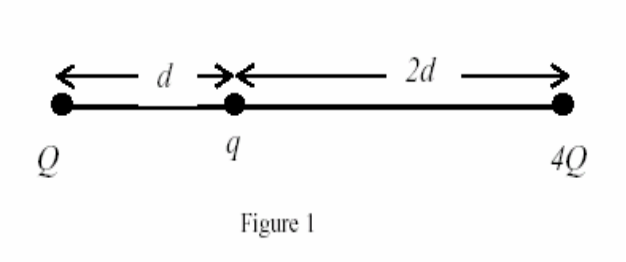

Figure 1