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**Course: Physics102**

**Course Title:**

**College: Medicine and Health Science**

**Department: Nursing**

**Matric no: 19/MHS02/085**

 **Covide19 Holiday Assignment**

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The presence of a + charge induces to move from spheres B to A. The two sphere system as polarized

(IV)

1. (B)

 The excess charge distributes itself uniformly over the surface of the spheres.

A

B

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Sphere B is separated from sphere A using the insulating stand the two spheres have opposite charges.

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(1)a A B (ii)

The metal spheres are mounted on insulating stands.

(III)

(1b) q1 +q 2 = 5.0 x 10-5C

 |q1|= q1 and |q2| = q2

 r2

 F= k q1 q2 = 1.0N

 K

 q1 q2 = (1.0N) r2

 q2 =5.0 x 10-5-q1

 q1 q2 = 4.449 x 10-10

 q1 (5.0 x 10-5-q1) = 4.449 x 10-10

 (5.0 x 10-5 q1-q12) = 4.449 x 10-10

 q12 – (5.0 x 10-5c) q1 + 4.449 x 10-10

 q1 q2 = (5 x 10-5) + (5 x 10-5)2 -4 (4.449 x 10-10)

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 ANS : q1 = 3.84 x 10-5 (q2 = 1.16 x 10-5c)

(2a) Electric field Electric field intensity

* Electric field is a vector, that both has a magnitude and a direction.
* It is a region around a charge in which an electric test charges would experience an electric force.
* Electric field intensity is the magnitude of vector.
* It is the strength of electric field at any point in space.

(3a) **. Volume charge density:**

 P=qv where q is the charge and v is the volume of the distribution. The SI unit is (C.M-3)

* **Surface charge density:**

o = qA where q is the charge and A is the area of the surface. The SI unit is (C.M-2)

* **Linear charge density:**

 = ql

 Is charge per unit length. The SI unit is (C.M-1)

(3b) The potential difference betwee points A and B, VB – VA, defined to be the change in p.e of a charge q moved from A to B, is equal to the charge, P.D is commonly called voltage, represented by the symbol V: V = pEq V = pEq and pE = q V

(3C) V = kx 10/x – k2/ (4+x)

 6r 2x = 10 (4+x)

 X = -40/8 = -5m

 In btw

 V = k10/ x – 2k/ (4-x) or O = 40 – x – 2x or x = 40/3 which is not in between the points.

 To the right

 V = 10k (x) -2k/ (( x-4) or

 10 x – 40 = 2x

 8x = 40 or x = 5m

(5a) Diot – savart law states that the magnetic flux density (magnetic induction) near a long straight conductor is directly proportional to the current in the conductor and inversely proportional to the distance from the conductor.

(5b)