SUMMER ASSIGNMENT
Class xii (PHYSICS)

Q1.What is the force between two small charged spheres having charges of 2 × 10−7 C and 3 × 10−7 C placed 30 cm apart in air?

Q2.The electrostatic force on a small sphere of charge 0.4 μC due to another small sphere of charge − 0.8 μC in air is 0.2 N. (a) What is the distance between the two spheres? (b) What is the force on the second sphere due to the first?

Q3. Check that the ratio ke2/G memp is dimensionless. Look up a Table of Physical Constants and determine the value of this ratio. What does the ratio signify?

Q4. (a) Explain the meaning of the statement 'electric charge of a body is quantized'.

(b) Why can one ignore quantization of electric charge when dealing with macroscopic i.e., large scale charges?

Q5.Four-point charges qA = 2 μC, qB = −5 μC, qC = 2 μC, and qD = −5 μC are located at the corners of a square ABCD of side 10 cm. What is the force on a charge of 1 μC placed at the centre of the square?

Q6. (a) An electrostatic field line is a continuous curve. That is, a field line cannot have sudden breaks. Why not?

(b) Explain why two field lines never cross each other at any point?

Q7. Two-point charges qA = 3 μC and qB = −3 μC are located 20 cm apart in vacuum.

(a) What is the electric field at the midpoint O of the line AB joining the two charges?

(b) If a negative test charge of magnitude 1.5 × 10−9 C is placed at this point, what is the force experienced by the test charge?

Q8. A system has two charges qA = 2.5 × 10−7 C and qB = −2.5 × 10−7 C located at points A: (0, 0, − 15 cm) and B: (0, 0, + 15 cm), respectively. What are the total charge and electric dipole moment of the system?

Question9. (a) Two insulated charged copper spheres A and B have their centers separated by a distance of 50 cm. What is the mutual force of electrostatic repulsion if the charge on each is 6.5 × 10−7 C? The radii of A and B are negligible compared to the distance of separation.

(b) What is the force of repulsion if each sphere is charged double the above amount, and the distance between them is halved?

Q10.(a) Why do the electrostatic field lines not form closed loops?

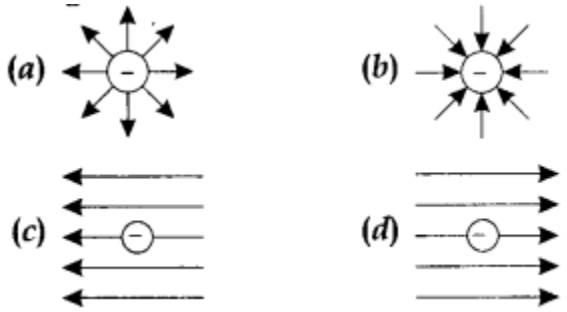
(b)Why is electric field zero inside a charged conductor?

(c) Why should a test charge be of negligibly small magnitude?

Mcq

1.Electric field lines provide information about
(a) field strength (b) direction c) nature of charged) all of these

2.Which of the following figures represent the electric field lines due to a single negative charge?



3.The SI unit of electric flux is
(a) $N\ C^{-1}\ m^{-2}$ (b) $N\ C\ m^{-2}$ (c) $N\ C^{-2}\ m^{2}$ (d) $N\ C^{-1}\ m^{2}$

4.The unit of electric dipole moment is
(a) newton (b) coulomb (c) farad d) debye

5.SI unit of permittivity of free space is
(a) Farad (b) Weber (c) $C^2N^{-1}\ m^{-2}$ (d) $C^2N^{-1}\ m^{-2}$

6.Two-point charges A and B, having charges +Q and – Q respectively are placed at a certain distance apart, and force acting between them is F. If 25% charge of A is transferred to B, then the force between the charges becomes?

1. 4F/3 2. F 3. 9F/16 4. 16F/9

7.Two charged spheres separated at a distance exert a force F on each other. If they are immersed in a liquid of dielectric constant 2, then what is the net force (if all conditions are the same) on each space?

1. F/2 2. F 3.2F 4. 4F