

Question 48423-08
1.50-44%

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?

- (a) $1.0 \times 10^{(-7)} \text{ C}$.
- (b) $8.0 \times 10^{(-9)} \text{ C}$.
- (c) $2.0 \times 10^{(-7)} \text{ C}$.
- (d) $3.0 \times 10^{(-7)} \text{ C}$.
- (e) $0.5 \times 10^{(-14)} \text{ C}$.

Question 48523-08
1.30-71%

A uniform electric field is set up between two large charged plates, see Figure 3. An electron is released from the negatively charged plate, and at the same time, a proton is released from the positively charged plate. They cross each other at a distance of $5.00 \times 10^{(-6)} \text{ m}$ from the positively charged plate. If only the field due to the charged plates is considered, find the distance between the two plates. [Take the ratio mass of the electron : mass of the proton = 1 : 1833]

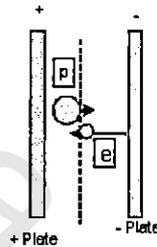


Figure 3

- (a) 2.34 mm.
- (b) 11.3 mm.
- (c) 14.6 mm.
- (d) 7.77 mm.
- (e) 9.19 mm.

Question 48623-08
1.55-55%

An electron is moving along the positive x-axis with a constant speed of $1.5 \times 10^{(8)} \text{ m/s}$. When it is at a point +500 m from the origin, an electric field of magnitude $2.0 \times 10^{(3)} \text{ N/C}$ and directed along the positive x-axis is switched on. How far will the electron reach in the field before stopping momentarily?

- (a) 511 m.
- (b) 468 m.
- (c) 502 m.
- (d) 551 m.
- (e) 532 m.

23-9 A Dipole in an Electric field**Question 487**

23-09

An electric dipole consists of a positive charge of magnitude $6.0 \times 10^{(-6)} \text{ C}$ at the origin and a negative charge of magnitude $6.0 \times 10^{(-6)} \text{ C}$ on the x-axis at $x = 3.0 \times 10^{(-3)} \text{ m}$. Its dipole moment is:

- (a) $1.8 \times 10^{(-8)} \text{ C.m}$, in the positive x direction.
- (b) $1.8 \times 10^{(-8)} \text{ C.m}$, in the negative x direction.
- (c) $1.8 \times 10^{(-8)} \text{ C.m}$, perpendicular to the x-axis.
- (d) $3.6 \times 10^{(-8)} \text{ C.m}$, in the negative x direction.
- (e) Zero because the net charge is Zero.

Question 48823-09
0.17-52%

Which of the following statements is WRONG:

- (a) A shell of uniform charge density exerts a constant force on a charge inside it.
- (b) Electric field lines extend away from a positive charge.
- (c) Electric field can exert a torque on an electric dipole.
- (d) A shell of uniform charge density exerts a constant force on a charge outside it.
- (e) The magnitude of the charge on a positive ion is an integer multiple of the electron charge.

Question 48923-09
0.55-53%

An electric dipole consists of charges $+2e$ and $-2e$ separated by 0.78×10^{-9} m. It is in an electric field of strength 3.0×10^6 N/C. Calculate the magnitude of the torque on the dipole when the dipole is perpendicular to the field. [e is the magnitude of the charge on the electron.]

- (a) 6.5×10^{-22} N.m.
- (b) 8.5×10^{-22} N.m.
- (c) 3.5×10^{-22} N.m.
- (d) 7.5×10^{-22} N.m.
- (e) 0 N.m.

Question 490

23-09

An electric dipole consists of two opposite charges, each of magnitude 5.0×10^{-19} C, separated by a distance of 1.00×10^{-9} m. The dipole is placed in an electric field of strength 2.45×10^5 N/C. Calculate the magnitude of the torque exerted on the dipole when the dipole moment is perpendicular to the electric field.

- (a) 1.2×10^{-22} N.m.
- (b) 3.5×10^{-22} N.m.
- (c) -2.0×10^{-22} N.m.
- (d) 2.0×10^{-22} N.m.
- (e) -5.2×10^{-19} N.m.

Question 491

23-09

Which statement is false:

- (a) The electric dipole consists of two charges of the same magnitude but opposite sign.
- (b) Electric field lines extend away from negative charge and toward positive charge.
- (c) The principle of superposition applies to electric fields as well as to electrostatic forces.
- (d) When an electric dipole is placed in a uniform electric field, the net force on the dipole is zero.
- (e) Electric fields are vector fields.

Question 49223-09
0.28-62%

An electric dipole has a dipole moment of magnitude 2.0×10^{-9} C.m. The dipole is placed in an external electric field whose strength is 300 N/C, with its dipole moment initially perpendicular to the field. The electric field rotates the dipole until it is aligned parallel to the field. How much work is done by the electric field?

- (a) -12×10^{-7} J
- (b) $+12 \times 10^{-7}$ J
- (c) zero
- (d) -6.0×10^{-7} J
- (e) $+6.0 \times 10^{-7}$ J