quiz1

Started: Jul 10 at 3:44pm

Quiz Instructions

Question 1 — 1 pts

Materials in which the electrons are bound very loosely to the nuclei and can move about freely within the material are referred to as

- ○ superconductors.
- ○ polar.
- ○ insulators.
- ◉ conductors.
- ○ semiconductors.

Question 2 — 1 pts

A negatively charged rod is brought near one end of an uncharged metal bar. The end of the metal bar farthest from the charged rod will be charged

- ◉ negative.
- ○ neutral.
- ○ positive.
- ○ none of the given answers

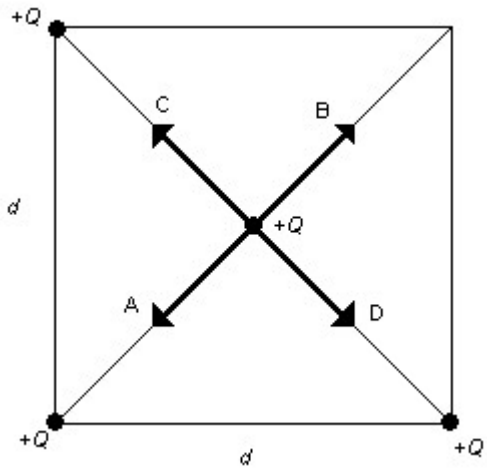
Question 3 1 pts

Two charged objects are separated by a distance *d*. The first charge is larger in magnitude than the second charge.

- (●) The charges exert forces on each other equal in magnitude and opposite in direction.
- ( ) The charges exert forces on each other equal in magnitude and pointing in the same direction.
- ( ) The first charge exerts a larger force on the second charge.
- ( ) The second charge exerts a larger force on the first charge.

Question 4 1 pts

FIGURE 21-1



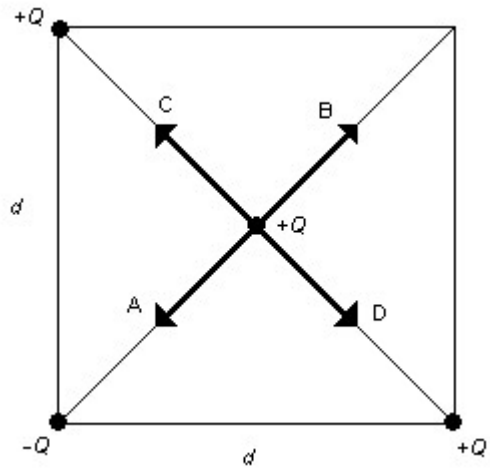
Three equal charges are at three of the corners of a square of side *d*. A fourth charge of equal magnitude is at the center of the square as shown in Fig. 21-1. Which of the arrows shown represents the net force acting on the charge at the center of the square?

- ( ) A

- (●) B
- ( ) C
- ( ) D
- ( ) none of the above

Question 5 1 pts

FIGURE 21-2

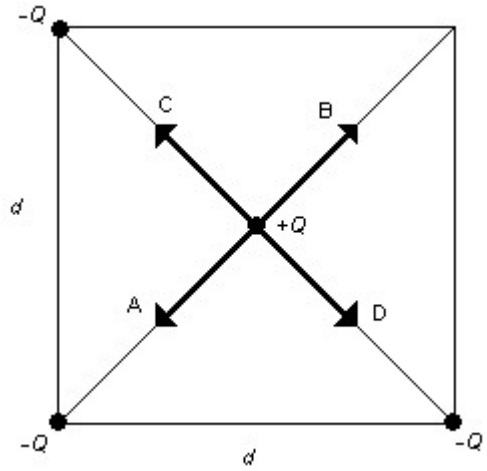


Four point charges of equal magnitudes but with varying signs are arranged on three of the corners and at the center of the square of side *d* as shown in Fig. 21-2. Which of the arrows shown represents the net force acting on the center charge?

- (●) A
- ( ) B
- ( ) C
- ( ) D
- ( ) none of the above

Question 6 — 1 pts

FIGURE 21-3

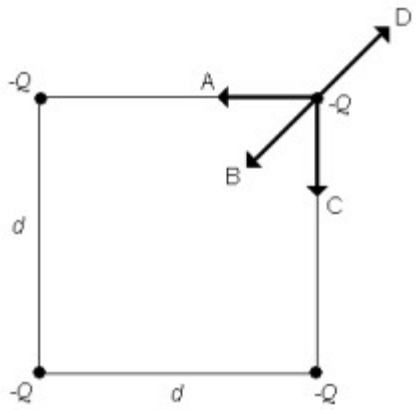


Four point charges of equal magnitude but with varying signs are arranged on three of the corners and at the center of the square of side *d* as shown in Fig. 21-3. Which of the arrows shown represents the net force acting on the center charge?

- (●) A
- ( ) B
- ( ) C
- ( ) D
- ( ) none of the above

Question 7 — 1 pts

FIGURE 21-5



Four point charges of equal magnitude and sign are arranged on the corners of the square of side *d* as shown in Fig. 21-5. Which of the arrows shown represents the net force acting on the charge at the upper right hand corner of the square?

- A
- B
- C
- D
- none of the above

Question 8 1 pts

The direction of the electric field halfway between an electron and a proton is

- perpendicular to the line from the electron to the proton.
- directed toward the electron.
- undefined since the electric field is zero.
- directed toward the proton.
- cannot be determined.

Question 9 — 1 pts

Is it possible to have a zero electric field value between a negative and positive charge along the line joining the two charges?

- (●) No, a zero electric field cannot exist between the two charges.
- ( ) Yes, if the two charges are equal in magnitude.
- ( ) Yes, regardless of the magnitude of the two charges.
- ( ) cannot be determined without knowing the separation between the two charges
- ( ) cannot be determined without knowing the magnitude of the charges

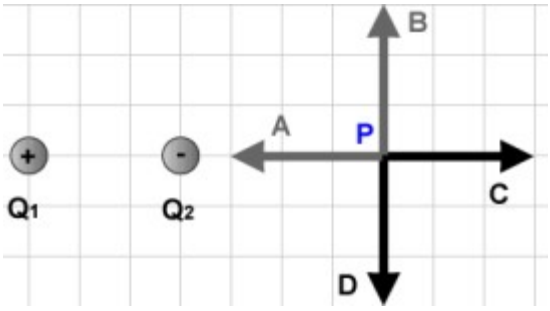
Question 10 — 1 pts

Is it possible to have a zero electric field value between two positive charges along the line joining the two charges?

- (●) Yes, regardless of the magnitude of the two charges.
- ( ) Yes, if the two charges are equal in magnitude.
- ( ) No, a zero electric field cannot exist between the two charges.
- ( ) cannot be determined without knowing the separation between the two charges
- ( ) cannot be determined without knowing the magnitude of the charges

Question 11 — 1 pts

FIGURE 21-7



Two charges Q_1 and Q_2 of equal magnitudes and opposite signs are positioned as shown in Fig. 21-7. Which of the shown arrows represents correctly the electric field at point P?

- (●) A
- ( ) B
- ( ) C
- ( ) D
- ( ) The field is equal to zero at point P.

Question 12 — 1 pts

Two large, flat, horizontally oriented plates are parallel to each other, a distance *d* apart. Half-way between the two plates the electric field field has a magnitude E. If the separation of the plates is reduced to *d*/2 what is the magnitude of the electric field half-way between the plates?

- (●) E
- ( ) 0
- ( ) 2E
- ( ) E/2

4E

Question 13 1 pts

FIGURE 21-11

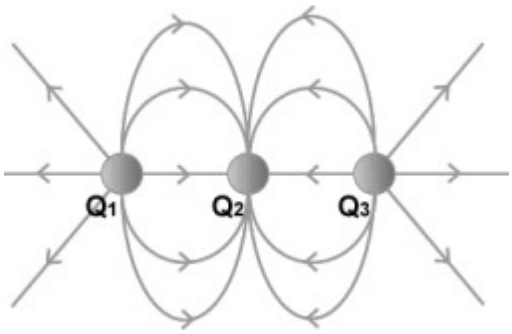


Fig. 21-11 shows 3 electric charges labeled Q_1, Q_2, Q_3 and some electric field lines in the region surrounding the charges. What are the signs of the 3 charges?

- Q_1 is positive, Q_2 is positive, Q_3 is negative.
- All 3 charges are negative.
- All 3 charges are positive.
- Q_1 is positive, Q_2 is negative, Q_3 is positive.
- Q_1 is negative, Q_2 is positive, Q_3 is negative.

Question 14 1 pts

FIGURE 21-12

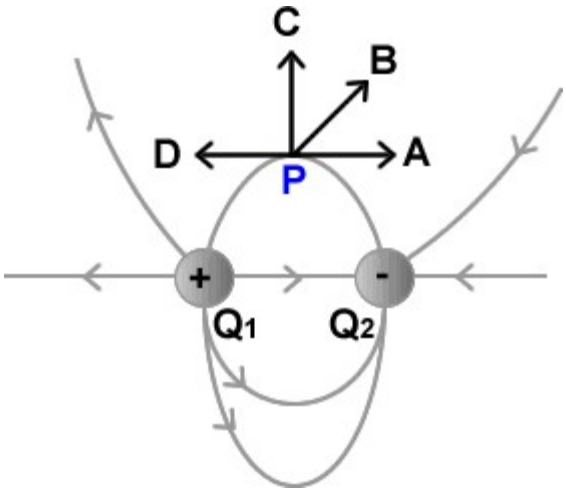


Fig. 21-12 shows two electric charges of equal magnitudes and opposite signs. Electric field lines surrounding the charges are also shown. Which of the shown arrows correctly represents the electric field vector at point P?

- (●) A
- ( ) B
- ( ) C
- ( ) D
- ( ) The electric field is zero at point P.

Question 15 1 pts

Can electric field lines intersect in free space?

- (●) No.
- ( ) Yes, but only at the centroid of an equilateral triangle with like charges at each corner.
- ( ) Yes, but only at the midpoint between two equal like charges.

- Yes, but only at the midpoint between a positive and a negative charge.

Question 16 — 1 pts

An electron and a proton, are released simultaneously from rest and start to move towards each other because of the attractive Coulomb force between them. They are initially separated by a distance *d*. The two particles eventually collide. When they collide,

- they are at the midpoint of their initial separation.
- they are closer to the electron's initial position.
- **they are closer to the proton's initial position.**
- Not enough data is given to predict where they collide.

Question 17 — 1 pts

If two uncharged objects are rubbed together and one of them acquires a positive charge then the other one

- may or may not acquire a positive charge.
- also acquires a positive charge.
- **may or may not acquire a negative charge.**
- acquires a negative charge.
- remains the same.

Question 18 — 1 pts

A charge +3q is placed at x = 0 and a charge +11q is placed at x = 5 units. Where, along the x-axis is the net force on a charge Q equal to zero?

- ○ x = 0.27 units
- ○ x = 0.52 units
- ○ x = 0.48 units
- ◉ x = 1.72 units
- ○ x = 0.21 units

Question 19 — 1 pts

A copper penny has a mass of 3.0 g. A total of 4.0×10^{12} electrons are transferred from one neutral penny to another. If the electrostatic force of attraction between the pennies is equal to the weight of a penny, what is the separation between them?

- ◉ 35 cm
- ○ 39 cm
- ○ 31 cm
- ○ 33 cm
- ○ 37 cm

Question 20 — 1 pts

A 5.0-C charge is 10 m from a small test charge. What is the magnitude of the force experienced by a 1.0 nC charge placed at the location of the test charge?

- ○ 450 N

- ○ 0.045 N
- ○ 45 N
- ◉ 0.45 N
- ○ 4.5 N

Question 21 — 1 pts

Two point charges of +20.0 μC and -8.00 μC are separated by a distance of 20.0 cm. What is the intensity of electric field *E* midway between these two charges?

- ○ 25.2×10^6 N/C directed towards the positive charge
- ○ 25.2×10^5 N/C directed towards the positive charge
- ○ 25.2×10^4 N/C directed towards the negative charge
- ○ 25.2×10^5 N/C directed towards the negative charge
- ◉ 25.2×10^6 N/C directed towards the negative charge

Question 22 — 1 pts

If the earth's electric field is 100 N/C downward, what must be the charge on a 1-kg object so that it would be "weightless"?

- 9.8 C
- -9.8×10^{-2} C
- 0.22 C
- 9.8×10^{-2} C
- 1.0 C

Question 23 — 1 pts

Two charges Q_1 = -3 μC and Q_2 = +3 μC are located on the y-axis at y_1 = -5 cm and $y_2 = +5$ cm respectively. A third charge Q_3 = +24 μC is added on the y-axis so that the electric field at the origin is equal to zero. What is the position of Q_3?

- y_3 = +5 cm
- y_3 = 0 cm
- y_3 = +10 cm
- y_3 = -12 cm
- y_3 = -10 cm

Question 24 — 1 pts

Two point charges each have a value of 3.0 C and are separated by a distance of 4.0 m. What is the electric field at a point midway between the two charges?

- 4.5×10^{7} N/C

- ○ 9.0×10^7 N/C
- ○ 18×10^7 N/C
- ◉ zero
- ○ 3.6×10^7 N/C

Question 25 — 1 pts

A thin, circular disk of radius R = 30 cm is oriented in the yz-plane with its center as the origin. The disk carries a total charge Q = +3 μC distributed uniformly over its surface. Calculate the magnitude of the electric field due to the disk at the point x = 15 cm along the x-axis.

- ○ 9.95×10^5 N/C
- ○ 2.49×10^5 N/C
- ○ 1.99×10^5 N/C
- ○ 4.98×10^5 N/C
- ◉ 3.32×10^5 N/C

Question 26 — 1 pts

An electric field is set up between two parallel plates, each of area 2.0 m^2, by putting 1.0 μC charge on one plate and a -1.0 μC charge on the other. The plates are separated by 4.0 mm. What is the magnitude of the electric field between the plates at a distance of 1.0 mm from the positive plate?

- ○ 3.1×10^4 N/C
- ◉ 5.6×10^4 N/C

- 1.4×10^4 N/C
- 4.2×10^4 N/C
- 0 N/C

Question 27 — 1 pts

A proton is placed in an electric field of intensity 700 N/C. What is the magnitude and direction of the acceleration of this proton due to this field?

- 67.1×10^{10} m/s^2 opposite to the electric field
- 6.71×10^{10} m/s^2 opposite to the electric field
- 67.1×10^{10} m/s^2 in the direction of the electric field
- (selected) 6.71×10^{10} m/s^2 in the direction of the electric field
- 6.71×10^{9} m/s^2 opposite to the electric field

Question 28 — 1 pts

An electric dipole of dipole moment $\vec{p} = (5 \times 10^{-10}\ \text{C.m})\,\hat{i}$ is placed in an electric field $\vec{E} = (2 \times 10^6\ \text{N/C})\,\hat{i} + (2 \times 10^6\ \text{N/C})\,\hat{j}$. What is the maximum torque experienced by the dipole?

- 0 N.m
- 2.80×10^{-3} N.m
- 2.00×10^{-3} N.m
- (selected) 1.00×10^{-3} N.m
- 1.40×10^{-3} N.m

Quiz saved at 4:33pm Submit Quiz