McRoberts Secondary

Electricity Test 2025-12-01

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In this section **no** changes or modifications must be made!

Scrambling 0 0

Type: 015

Exam ID(Physics 12): 25120100002

Please mark the boxes carefully: ☒ Not marked: ☐ or ■

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Only clearly marked and positionally accurate crosses will be processed!

Answers 1 - 15

	a	b	c	d
1	☐	☐	☐	☐
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12	☐	☐	☐	☐
13	☐	☐	☐	☐
14	☐	☐	☐	☐
15	☐	☐	☐	☐
	a	b	c	d

1. Which of the following is a scalar? **Select all that apply.**
    a. Electric force.
    b. Electric charge.
    c. Electric potential.
    d. Electric potential energy.
2. What is always true of an electrically charged object?
    a. It has an unequal number of protons and electrons.
    b. It has no neutrons.
    c. It has more electrons than protons.
    d. It has more protons than electrons.
3. Electric field lines
    a. Circle clockwise around negative charges.
    b. Radiate outward from positive charges.
    c. Radiate outward from negative charges.
    d. Circle clockwise around positive charges.
4. The electron-volt (eV) is a unit of
    a. Current.
    b. Voltage.
    c. Energy.
    d. Power.
5. What is the magnitude of the coulomb force a $+5.6\,\mu$C charge exerts on a $+7.5\,\mu$C charge 33 cm away?
    a. 20 N
    b. 2.8 N
    c. 3.5 N
    d. 16 N
6. The magnitude of the electric field at a distance of 17 m from a point charge is 1 N/C. What is the magnitude of the electric field at a distance of 12 m from the point charge?
    a. $(17/12)^2$ N/C
    b. $(17/12)$ N/C
    c. $(12/17)^2$ N/C
    d. $(12/17)$ N/C
7. Two point charges are separated by a distance of 1 cm. Their electric potential energy is 1 J, relative to infinity. What would their electric potential energy be if the separation is changed to 4 cm?
    a. $(1/4)$ J
    b. $(4/1)$ J
    c. $(4/1)^2$ J
    d. $(1/4)^2$ J

8. The electric potential at a distance of 13 m from a point charge is 1 V. What is the electric potential at a distance of 12 m from the point charge?

   a. $(13/12)^2$ V
   b. $(12/13)$ V
   c. $(13/12)$ V
   d. $(12/13)^2$ V

9. Two charged objects repel each other with a force F. What is the force between them if one charge multiplied by 9, the other charge is multiplied by 5, and the distance between them is reduced to $1/3$ its original value?

   a. $(45/9)\,\mathrm{F}$
   b. $135\,\mathrm{F}$
   c. $405\,\mathrm{F}$
   d. $(45/3)\,\mathrm{F}$

10. What is the force on a $+5.7$ mC charge when placed in a uniform electric field of strength 491 N/C?

    a. 4.2 N
    b. 3.1 N
    c. 3.4 N
    d. 2.8 N

11. It takes 10 J of energy to move 9.1 C of charge from point A to point B. What is the potential difference between points A and B?

    a. 0.91 V
    b. 45 V
    c. 1.1 V
    d. 91 V

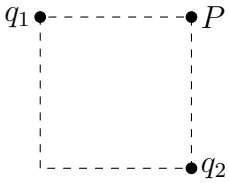
12. Consider a uniform electric field of 14.0 N/C pointing toward the east. If the voltage measured relative to ground at a given point in the field is 803 V, what is the voltage at a point 4.00 m directly west of the point?

    a. -1270 V
    b. 1060 V
    c. 741 V
    d. 859 V

13. What is the magnitude of the electric field 30 cm away from a $+4.7$ nC point charge?

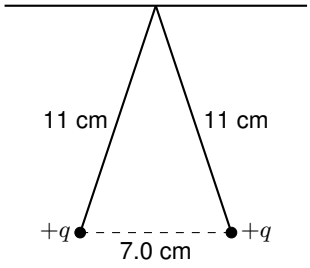
    a. 85 N/C
    b. 420 N/C
    c. 150 N/C
    d. 470 N/C

14. Two point charges, $\mathrm{q}_1 = 9.0\,\mu\mathrm{C}$ and $\mathrm{q}_2 = -2.0\,\mu\mathrm{C}$, are fixed at opposing corners of a square of side length 7.0 m. What is the electric field strength at one of unoccupied corners of the square (point P in the figure)?



a. 1700 N/C
b. 2500 N/C
c. 2100 N/C
d. 1100 N/C

15. Two balls, each of mass 1.0 kg, acquire the same electric charge. Each charge is suspended from the same point by a massless, electrically insulating string. They repel each other and hang with a separation of 7.0 cm. The length of the string from the point of support to the centre of a ball is 11 cm. What is the charge on each ball? (The figure is not drawn to scale.)



a. 2 μC
b. 0.88 μC
c. 2.4 μC
d. 1.3 μC