McRoberts Secondary

Electricity Retest 2025-01-20

Personal Data

Family Name:

Given Name:

Signature:

checked

Registration Number

0	☐	☐	☐	☐	☐	☐	☐	0
1	☐	☐	☐	☐	☐	☐	☐	1
2	☐	☐	☐	☐	☐	☐	☐	2
3	☐	☐	☐	☐	☐	☐	☐	3
4	☐	☐	☐	☐	☐	☐	☐	4
5	☐	☐	☐	☐	☐	☐	☐	5
6	☐	☐	☐	☐	☐	☐	☐	6
7	☐	☐	☐	☐	☐	☐	☐	7
8	☐	☐	☐	☐	☐	☐	☐	8
9	☐	☐	☐	☐	☐	☐	☐	9

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

Scrambling 0 0

Type: 015

Exam ID(Physics 12): 25012000001

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

This document is scanned automatically. Please keep clean and do not bend or fold. For filling in the document please use a **blue or black pen**.
Only clearly marked and positionally accurate crosses will be processed!

Answers 1 - 15

	a	b	c	d
1	☐	☐	☐	☐
2	☐	☐	☐	☐
3	☐	☐	☐	☐
4	☐	☐	☐	☐
5	☐	☐	☐	☐
6	☐	☐	☐	☐
7	☐	☐	☐	☐
8	☐	☐	☐	☐
9	☐	☐	☐	☐
10	☐	☐	☐	☐
11	☐	☐	☐	☐
12	☐	☐	☐	☐
13	☐	☐	☐	☐
14	☐	☐	☐	☐
15	☐	☐	☐	☐
	a	b	c	d

1. Which of the following are vector quantities? **Select all that apply.**
    a. Electric potential.
    b. Electric field.
    c. Electric force.
    d. Electric potential difference (voltage).
2. What is always true of an electrically neutral object?
    a. It has more neutrons than protons or electrons.
    b. It is made up of neutrons only.
    c. It is repelled by charged objects.
    d. It is attracted to charged objects.
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 $+9.1\,\mu$C charge exerts on a $+7\,\mu$C charge 34 cm away?
    a. 5 N
    b. 24 N
    c. 43 N
    d. 19 N
6. The magnitude of the electric field at a distance of 14 m from a point charge is 1 N/C. What is the magnitude of the electric field at a distance of 3 m from the point charge?
    a. $(3/14)$ N/C
    b. $(3/14)^2$ N/C
    c. $(14/3)^2$ N/C
    d. $(14/3)$ N/C
7. Two point charges are separated by a distance of 17 cm. Their electric potential energy is 1 J, relative to infinity. What would their electric potential energy be if the separation is changed to 2 cm?
    a. $(2/17)$ J
    b. $(17/2)^2$ J
    c. $(17/2)$ J
    d. $(2/17)^2$ J

8. The electric potential at a distance of 2 m from a point charge is 1 V. What is the electric potential at a distance of 1 m from the point charge?

   a. $(2/1)$ V
   b. $(2/1)^2$ V
   c. $(1/2)^2$ V
   d. $(1/2)$ V

9. Two charged objects repel each other with a force F. What is the force between them if one of the charges is multiplied by 9, the other charge is multiplied by 7, and the distance between them is reduced to $1/6$ its original value?

   a. $(63/6)\,\mathrm{F}$
   b. $(63/36)\,\mathrm{F}$
   c. $2268\,\mathrm{F}$
   d. $378\,\mathrm{F}$

10. What is the force on a $+7.3$ mC charge when placed in a uniform electric field of strength 682 N/C?

    a. 6.4 N
    b. 5 N
    c. 3.7 N
    d. 3.1 N

11. It takes 25 J of energy to move 1.9 C of charge from point A to point B. What is the potential difference between points A and B?

    a. 48 V
    b. 22 V
    c. 13 V
    d. 0.08 V

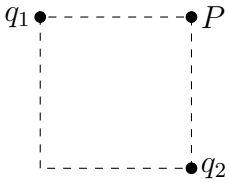
12. Consider a uniform electric field of 47.0 N/C pointing toward the east. If the voltage measured relative to ground at a given point in the field is 318 V, what is the voltage 6.00 m directly south of the point?

    a. -23.7 V
    b. -388 V
    c. 318 V
    d. 142 V

13. What is the electric field strength 37 cm away from a $+5$ nC point charge?

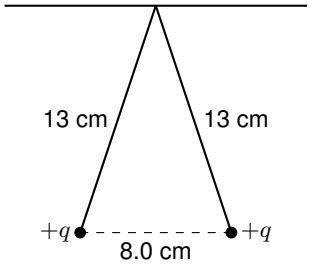
    a. 1300 N/C
    b. 95 N/C
    c. 330 N/C
    d. 2800 N/C

14. Two point charges, $q_1 = -2.0\,\mu$C and $q_2 = -6.0\,\mu$C, are fixed at opposing corners of a square of side length 3.0 m as shown in the figure. What is the electric field strength at one of the unoccupied corners of the square (point P in the figure)?



a. 9200 N/C
b. 7100 N/C
c. 6300 N/C
d. 8500 N/C

15. Two balls, each of mass 0.99 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 8.0 cm. The length of the string from the point of support to the centre of a ball is 13 cm. What is the charge on each ball? (The figure is not drawn to scale.)



a. 0.07 μC
b. 1.1 μC
c. 1.5 μC
d. 0.37 μC