

Retest must *show work*
write 3-5 word explain
draw pic
 Due Wed
 Name _____ Period _____ Date _____

Unit 10 Electrostatics Comprehensive Quiz

1. A force of 12N is exerted by two similar charges that are 30cm apart. What is the force when the charges are 60cm apart?

- a. .25N
- b. 2N
- c. 3N
- d. 6N

$r \uparrow 2$
 $F_e = \frac{k q_1 q_2}{2r^2} = \frac{1}{2^2} = \frac{1}{4}$
 $12 \cdot \frac{1}{4} = 3\text{N}$

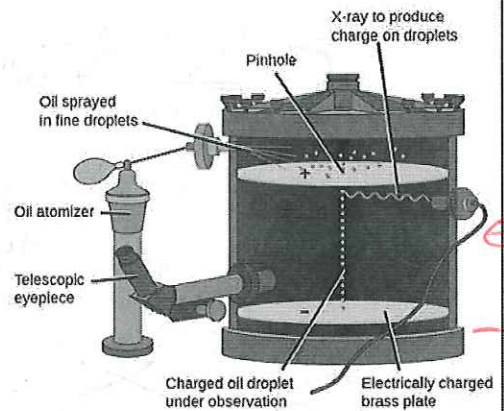
Milliken dropped negatively charged oil drops onto a negatively charge plate

2. What force did Milliken's Oil Drop experiment utilize?

- a. Repulsive force
- b. Attractive force
- c. Gravitational force
- d. Magnetic force

3. What did Milliken's Oil Drop Experiment determine?

- a. value of 1 coulomb
- b. mass of an electron
- c. charge of an electron
- d. attractive force of gravity



4. The tingly feeling on your skin when you stand next to a charged Van de Graaff generator without actually touching it is an example of

- a. Charging by friction *rubbing*
- b. Charging by induction *in vicinity/near*
- c. Charging by conduction *contact*
- d. None of these



5. A force of 14N is exerted by two similar charges that are 40cm apart. What is the force when the charges are 20cm apart?

- a. .25N
- b. 4N
- c. 28N
- d. 56N

$r \downarrow \frac{1}{2}$
 $F_e = \frac{k e q_1 q_2}{\frac{1}{2}r^2} = \frac{1}{\frac{1}{2}^2} = \frac{1}{\frac{1}{4}} = 1 \cdot \frac{4}{1} = 4$
 $14 \cdot 4 = 56$

6. Currently, what is the most common supplier of electricity to our homes

- a. conductors
- b. insulators
- c. semiconductors
- d. superconductors

7. Why are superconductors currently not the main supplier of electricity to our homes?

- a. Superconductors do not utilize green technology
- b. It is too difficult to supercool superconductors
- c. Superconductors use too much fossil fuels
- d. Superconductors increase our reliance on foreign oil

8. What is the force exerted by two $1.3 \times 10^{-6} \text{C}$ charges that are 5m apart?

- a. $6.08 \times 10^{-4} \text{N}$
- b. $3.04 \times 10^{-3} \text{N}$
- c. $1.52 \times 10^{-2} \text{N}$
- d. $4.68 \times 10^2 \text{N}$

$$F_e = \frac{k q_1 q_2}{r^2} = \frac{(9 \times 10^9) (1.3 \times 10^{-6}) (1.3 \times 10^{-6})}{5^2}$$

ans x

9. The development of semiconductors began the

- a. computer era + all tech
- b. fight for greener technology
- c. race for the atomic bomb
- d. had a negligible effect on society

$$\frac{0.015}{25} = .0006084$$

10. What type of energy causes two charges to repel?

- a. gravitational attractive energy
- b. gravitational potential energy
- c. electric kinetic energy
- d. electric potential energy

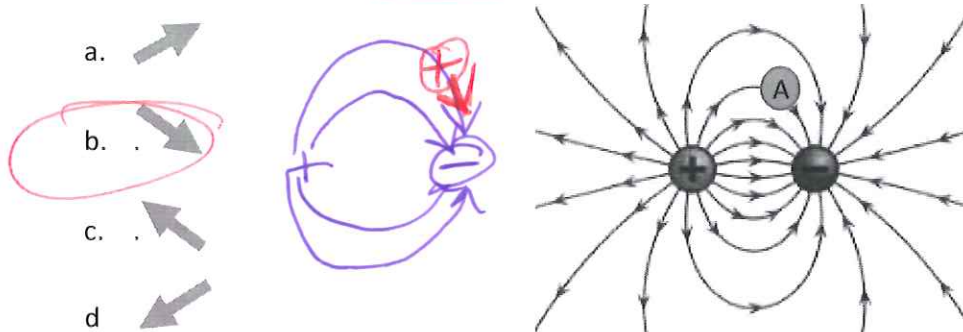
11. The transfer of charge between rabbit fur when rubbed on a balloon is an example of

- a. Charging by friction
- b. Charging by induction
- c. Charging by conduction contact
- d. None of these

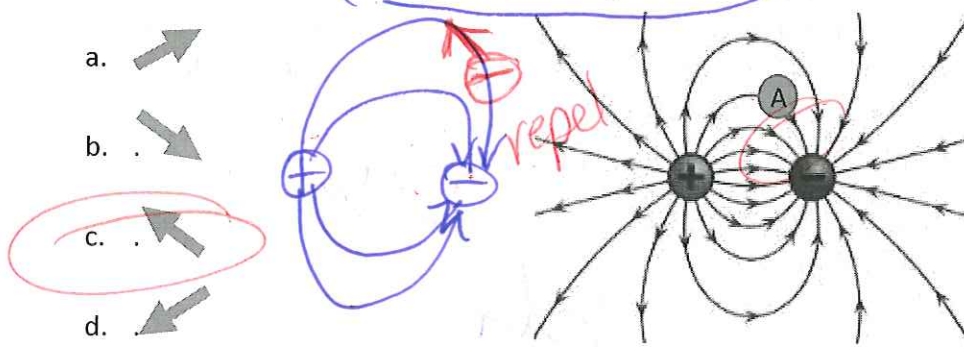
12. What detects charges qualitatively

- a. Ampmeter *evaluation not #*
- b. Ohmmeter
- c. Electroscope *charge exists*
- d. ~~Electrometer~~

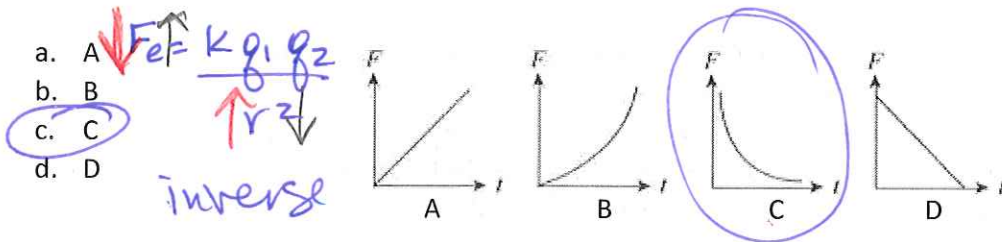
13. Predict the movement of the positive test charge at Point A in the electric field



14. Predict the movement of the negative test charge at Point A in the electric field



15. Graph the relationship of electromagnetic force and the distance between the charges



16. Electric field lines

- a. Point away from a positive charge
- b. Point towards a negative charge
- c. Never cross
- d. All of the above

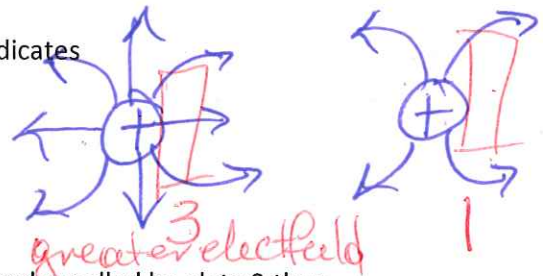


17. What does an electroscope do? *if there is a charge*

- a. measures the presented charge qualitatively not quantitatively
- b. measures the presented charge quantitatively not qualitatively
- c. measures the gravitational attraction qualitatively not quantitatively
- d. measures the gravitational attraction quantitatively not qualitatively

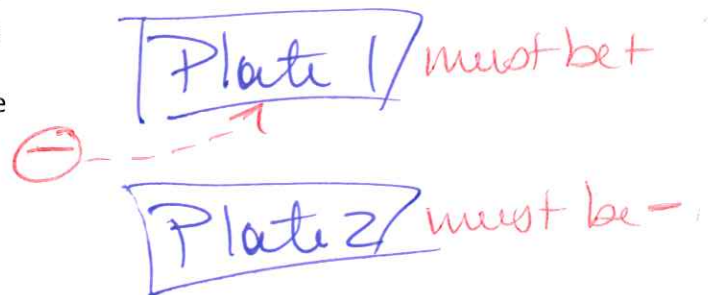
18. The number of electric field lines in a region of space indicates

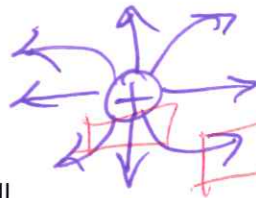
- a. The strength of electric field
 - b. The charge of particles
 - c. The mass of the charge
 - d. Whether the charge is spin-up or spin-down
- or how close to charge*



19. If a negatively charged particle is attracted to a plate 1 and repelled by plate 2 then

- a. Plate 1 is positive and Plate 2 is negative
- b. Plate 1 is negative and Plate 2 is positive
- c. Plate 1 is positive and Plate 2 is positive
- d. Plate 1 is negative and Plate 2 is negative





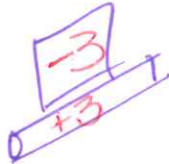
20. The electric field surrounding a charge object will

- a. Have fewer field lines closer to the charge and more field lines farther away
- b. Have more field lines closer to the charge and fewer field lines farther away
- c. Have the same number of field lines near the charge as far away
- d. Neither a nor b

Strength of elect field

21. A glass rod is charged with silk cloth charging the rod with a $+3nC$ charge. What charge does the silk cloth obtain from this interaction?

- a. $+3nC$
- b. $-3nC$
- c. $+6nC$
- d. $-6nC$



22. In electrostatic experiments, why is the charged rod never a conductor

- a. Conductors cannot be charged
- b. A charged conductor is too easily discharged by touching
- c. Charges on conductors do not radiate electric fields thus attracting objects
- d. Conducting rods are used in electrostatic experiments in the same way insulator rods are used.

23. Which of the following statements is true about insulators?

- a. Insulators are poor conductors of heat and electricity
- b. Insulators generally have more electrons than conductors
- c. Insulators general have more electrons than protons
- d. Insulating material is not attracted to charged objects

24. Draw electroscope when it is charged by a object with a positive charge. Show the positioning of the charges.

25. Draw electroscope when it is charged by a object with a negative charge. Show the positioning of the charges.

Draw answers on the answer document