Name: _____ Class: _____ Date: _____ ID: A

## Preliminary Quiz Statics

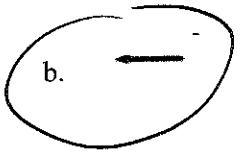
**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1.


+ + − attract

(#7) In the model above a proton is near a negatively charged particle, Which of the following vectors correctly describes the forces involved on particle P?

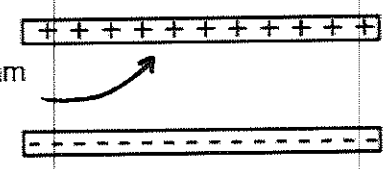
a. 

b. 

c. 

d. 

____ 2.




(#7) The electrostatic force exerted on the electrons by the electric field is directed
a. into the page
b. out of the page
c. toward the bottom of the page
d. toward the top of the page

____ 3. (#7) In an electric field, 0.90joules of work is required to bring 0.45C of charge from point A to point B. What is the potential difference between points A and B?
a. 5.0V
b. 2.0V
c. 0.50V
d. 0.41V

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____ 4. (#7-1) What quanity of excess electric charge could be found on an object?
a. 6.25E-19C
b. 4.80E-10C
c. 6.25 elementary charges
d. 1.60 elementary charges

$\frac{4.8}{1.6} = 3$

____ 5. (#7-1) The particles in a neucleaus are held together primarily by the
a. strong force
b. gravitational force
c. electrostatic force
d. magnetic force

____ 6. (#7-2) Which of the following is the units of an electric field?
a. ohm/m
b. eV
c. Cs
d. N/C

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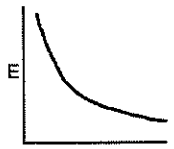
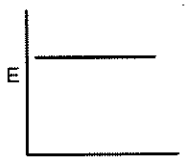
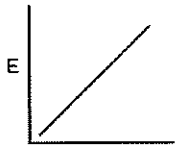
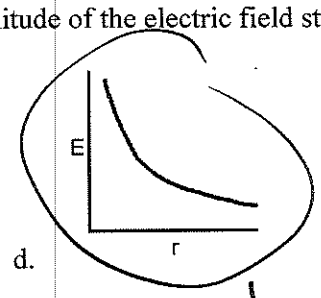
____ 7. (#7-2) Which graph best represents the relationship between the magnitude of the electric field strength (E) around the point charge and the distance ,r, fromt the point.

a. 


b. 

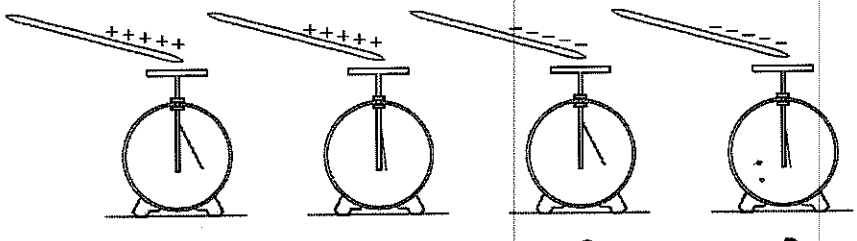

c. 


d. 


$\frac{1}{d^2}$

**Short Answer**

A charged rod is brought close to an electroscope that is initially uncharged. In Cases A and B, the rod is positively charged; in Cases C and D, the rod is negatively charged. In Cases A and C, the leaf of the electroscope is deflected the same amount, which is more than it is deflected in Cases B and D.

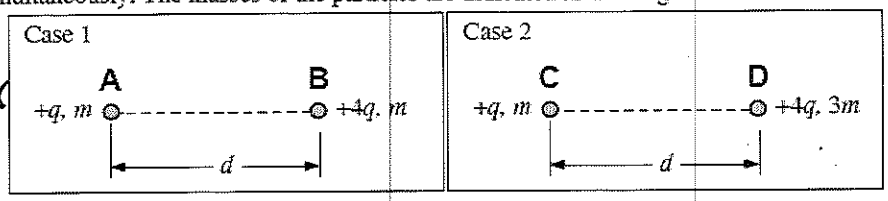



8. **Rank the net charge on the electroscope while the charged rod is near.** (The net charge will be a negative value if there is more negative than positive charge on the electroscope.)

| 1 Greatest | 2 | 3 | 4 Least | OR | All the same | All zero | Cannot determine |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

no charge was transferred

In each case shown, a particle of charge $+q$ is placed a distance $d$ from a particle of charge $+4q$. The particles are then released simultaneously. The masses of the particles are indicated in the diagram.



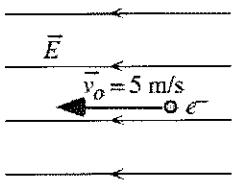

Left or Right does not matter

$F = ma$

9. **Rank the magnitude of the acceleration of each particle just after it is released.**

| 1 Greatest | 2 | 3 | 4 Least | OR | All the same | All zero | Cannot determine |
|---|---|---|---|---|---|---|---|
| A = C = B > D | | | | | | | |

10. An electron is placed in a uniform electric field with an initial velocity of 5 m/s as shown. A student makes the following statement:




*"The electron will continue to move in the same direction at a constant velocity because it is moving in the same direction as the electric force on it; since the electric field is constant, the force on the electron is constant."*

**What, if anything, is wrong with this statement? If something is wrong, explain the error and how to correct it. If the statement is valid, explain why.**

False, $F = ma$ a Force will cause an acceleration

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11. Two hydrogen atoms are bonded together seperated by a distance of 1 angstrom.(1.0E-10m)

a. What is the force of repulstion between the two protons (1 proton each) ?

$$F = \frac{(9.0E9)(1.6E-19)(1.6E-19)}{(1.0E-10)^2} = 2.3E-8N$$

b. What is the electric field strength at one hydrogen due to the other?

$$E = \frac{9.0E9\ 1.6E-19}{(1.0E-10)^2} = 1.44E11\ N/C$$

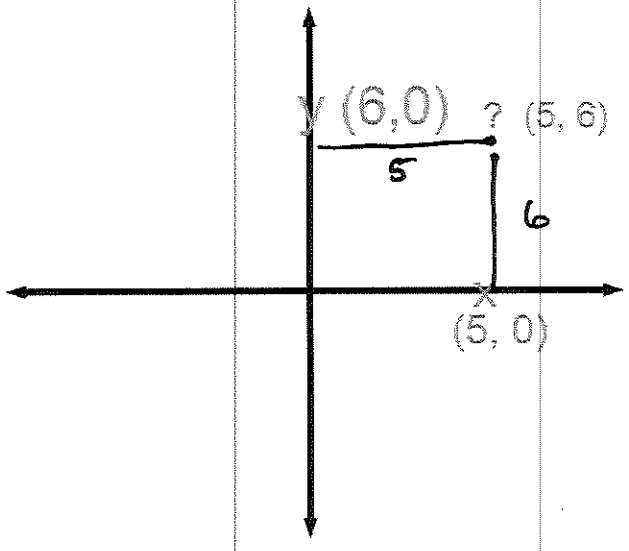
c. If the H were to bond to a Oxygen in stead at the same distance, calculate

- the new force ↳ 8pt $2.3E-8 \times 8 = 1.84E-7N$
- electric field produced by the hydrogen atom? No charge $1.44E11\ N/C$

d. At a distance of twice the bond length, what is the strength of the electric field of the hydrogen atom?

$1.44E11/4 = 3.6E-12\ N/C$

12. A 2C charge is placed at both x and y locations as seen on this graph below.



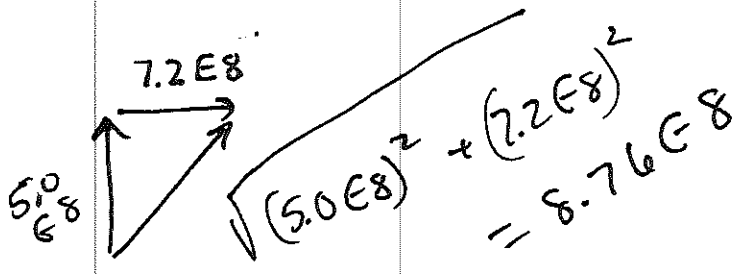

What is the electric field strenth at point (5,6)

Y

$$E = \frac{9.0E9(2)}{5^2} = 7.2E8\ N/C \rightarrow \text{Right}$$

X

$$E = \frac{9.0E9(2)}{6^2} = 5.0E8\ N/C \uparrow$$




$$\sqrt{(5.0E8)^2 + (7.2E8)^2} = 8.76E8$$