

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Part I**

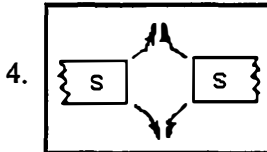
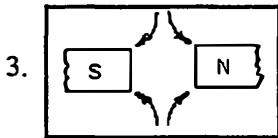
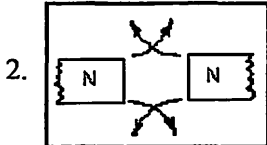
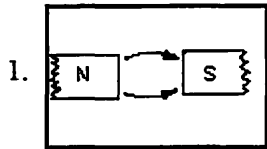
1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_

**PART II (answer 1 or 2 everyone is to complete 3&4 (show all work including equation and substitution with units))**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

Name: \_\_\_\_\_

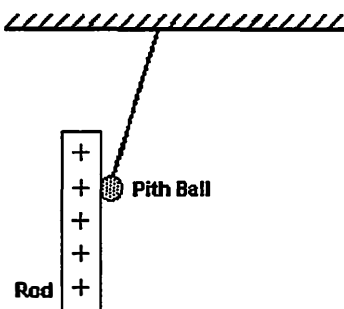
1. If the charge on each of two small spheres a fixed distance apart is doubled, the force of attraction between the spheres will be
  1. quartered
  2. doubled
  3. halved
  4. quadrupled
2. Which diagram below is the best representation of the lines of magnetic flux between the ends of two bar magnets?



3. Sphere *A* carries a charge of +2 coulombs and an identical sphere *B* is neutral. If the spheres touch one another and then are separated, the charge on sphere *B* would be

1. +1 C
2. +2 C
3. 0 C
4. +4 C

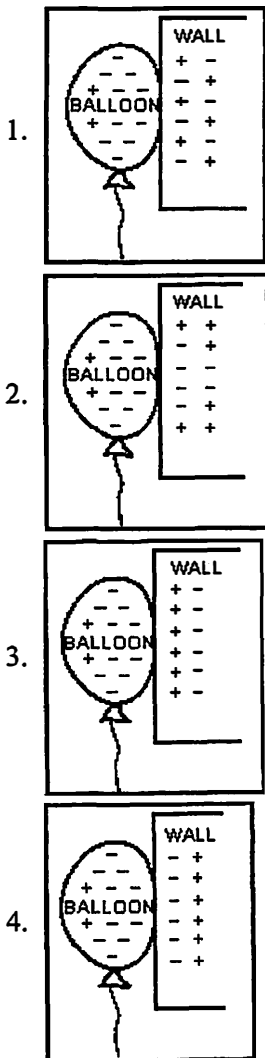
4. As shown in the diagram, a neutral pith ball suspended on a string is attracted to a positively charged rod.



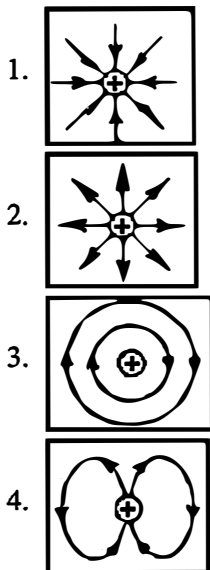
During contact with the rod, the pith ball

1. loses electrons
2. gains electrons
3. loses protons
4. gains protons

5. An inflated balloon which has been rubbed against a person's hair is touched to a neutral wall and remains attracted to it. Which diagram best represents the charge distribution on the balloon and the wall?



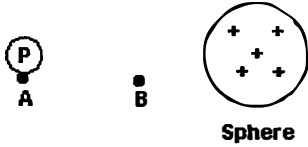
6. Which diagram best represents the electric field near a positively charged conducting sphere?



7. A metal sphere with an excess of 11 electrons is touched to an identical metal sphere with an excess of 15 electrons. After the spheres touch, the number of excess electrons on the second sphere is

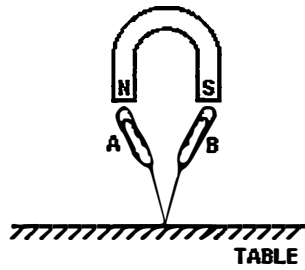
1. 26
2. 2
3. 13
4. 4

8. A glass rod is given a positive charge by rubbing it with silk. The rod has become positive by
1. gaining electrons
  2. gaining protons
  3. losing electrons
  4. losing protons
9. What is the magnitude of the electric force acting on an electron located in an electric field with an intensity of  $5.0 \times 10^3$  newtons per coulomb?
1.  $3.2 \times 10^{-23}$  N
  2.  $8.0 \times 10^{-16}$  N
  3.  $5.0 \times 10^3$  N
  4.  $3.2 \times 10^{22}$  N
10. The diagram below shows a proton  $P$  located at point  $A$  near a positively charged sphere.

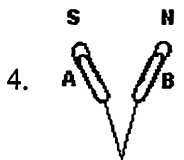
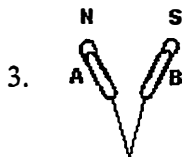
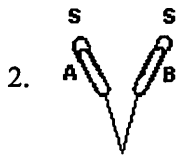
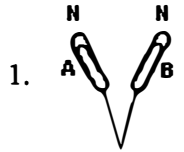


- If  $6.4 \times 10^{-19}$  joule of work is required to move the proton from point  $A$  to point  $B$ , the potential difference between  $A$  and  $B$  is
1.  $6.4 \times 10^{-19}$  V
  2.  $4.0 \times 10^{-19}$  V
  3. 6.4 V
  4. 4.0 V
11. A sphere has a net excess charge of  $-4.8 \times 10^{-19}$  coulomb. The sphere must have an excess of
1. 1 electron
  2. 1 proton
  3. 3 electrons
  4. 3 protons

12. In the diagram below, steel paper clips *A* and *B* are attached to a string, which is attached to a table. The clips remain suspended beneath a magnet.

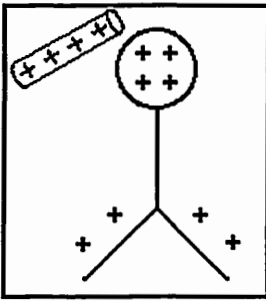


Which diagram below best represents the induced polarity of the paper clips?

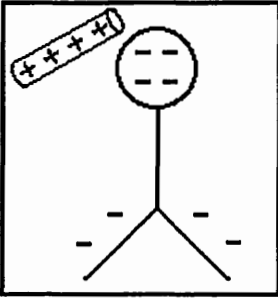


13. A positively charged rod is held near the knob of a neutral electroscope. Which diagram below best represents the distribution of charge on the electroscope?

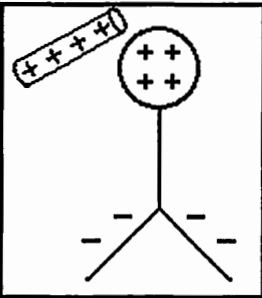
1.



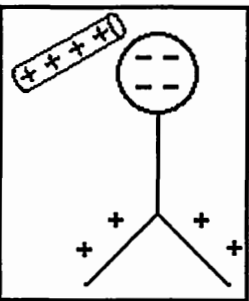
2.



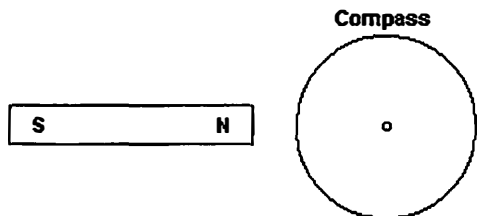
3.



4.



14. The diagram below shows a compass placed near the north pole, *N*, of a bar magnet.



Which diagram below best represents the position of the needle of the compass as it responds to the magnetic field of the bar magnet?

- 1. 

A rectangular box containing a vertical compass needle. The needle is a vertical line with a small circle at its center. The top end is shaded and labeled 'N', and the bottom end is labeled 'S'.
- 2. 

A rectangular box containing a vertical compass needle. The needle is a vertical line with a small circle at its center. The top end is labeled 'S' and the bottom end is shaded and labeled 'N'.
- 3. 

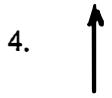
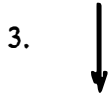
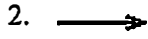
A rectangular box containing a horizontal compass needle. The needle is a horizontal line with a small circle at its center. The left end is shaded and labeled 'N', and the right end is labeled 'S'.
- 4. 

A rectangular box containing a horizontal compass needle. The needle is a horizontal line with a small circle at its center. The left end is labeled 'S' and the right end is shaded and labeled 'N'.

15. In the diagram below,  $P$  is a point near a negatively charged sphere.



Which vector best represents the direction of the electric field at point  $P$ ?





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Physics quiz  
**Static electricity**  
**PART II**

**Answer only 1 or 2 not both then everyone is to answer question 3 and 4:**

***(show all work including equation and substitution with units for all questions)***

1. A positive charge of  $7.0 \times 10^{-6} \text{ C}$  and a negative charge of  $5.0 \times 10^{-6} \text{ C}$  are  $4 \times 10^{-2} \text{ m}$  apart. What is the force between them?

2. A positive charge of  $4.0 \times 10^{-6} \text{ C}$  exerts a force of repulsion of  $28.2 \text{ N}$  on a second charge  $0.050 \text{ m}$  away. What is the sign and magnitude of the second charge?

3. An electron experiences a force of 22.6 N in an electric field. Determine the electric field strength

4. How much Force will it take to move a positive charge of  $9 \times 10^{-6} \text{ C}$  in an electric field that has a strength of 6500 N/C