Name_____
(20 points, due _____)

ELECTROSTATICS STUDY SHEET

Each of the following questions represents a concept discussed in class. Further information can be found in Chapters 16-17 of the text.

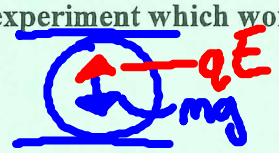
1. By how much does the electric force between a pair of charged particles change when their separation is doubled? Tripled?

$F = k(q_1 \times q_2 / d^2)$ $F \propto (q_1 \times q_2 / d^2)$ 1/4 quarters its 1/9

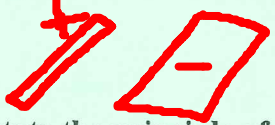
2. What factors determine whether an object is a conductor or an insulator? What is a semiconductor?

3. Who determined the value of a single charge? Describe (in terms of the 2 forces used) this person's famous experiment which won him the Nobel Prize in Physics.

Millikan



4. When rubbing a neutral glass rod with silk, the rod becomes positively charged, and yet total charge in conserved. Explain.



Electrons weren't lost

5. State the principle of electrostatic attraction and repulsion.

opposites attract and likes repel.

6. Define polarization. Use this to explain why neutral objects are attracted to charged.

they dont touch
uses net charge to attract or repel e

7. Distinguish between charging by conduction and charging by induction.

Conduction - charged item touches neutral and transfers charge. Induction starts with polarization and then grounds it causing opposite charge

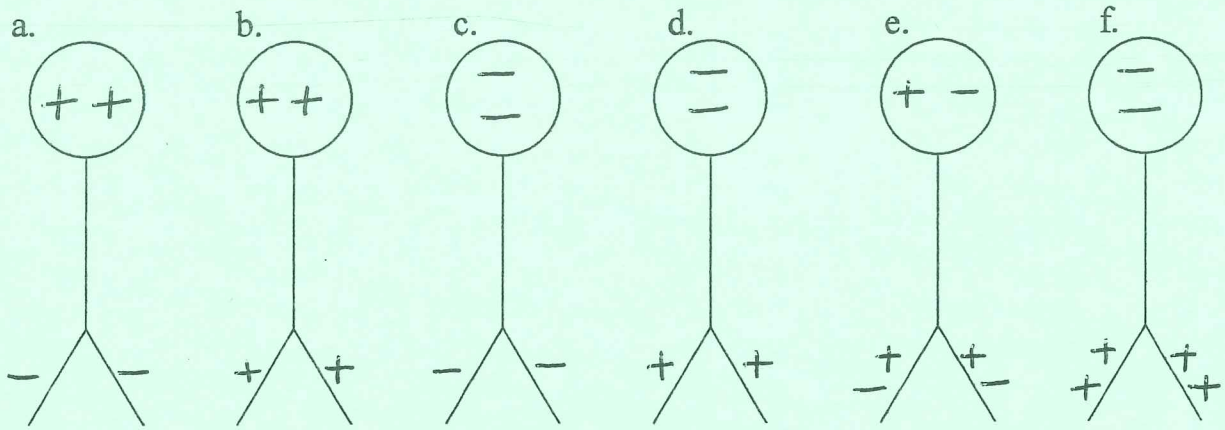
8. Put yourself inside the hollow Van de Graaff generator sphere. When turned on, would you feel a charge? Why or why not?

9. In what way is the charge of a proton similar and dissimilar to that of an electron?

They are opposites. Equal but opposites

10. List 5 practical examples of static electricity in today's world.

On the blanks below, place the letter of the diagram that best represents the charge on an electroscope during each of the procedures described:



D 1. A positively-charged rod is brought near an uncharged electroscope.

C 2. A glass rod is charged positively by rubbing it with silk. The silk is then touched to a neutral electroscope.

C 3. A positively-charged rod is brought near a neutral electroscope and the electroscope is charged by induction (by grounding).

B 4. A neutral electroscope is charged by conduction using a positive rod.

A 5. A negatively-charged rod is brought near a neutral electroscope.

F 6. A positively-charged rod is brought near a positively-charged electroscope.

E 7. A metal rod is brought in contact with a positively-charged electroscope.

B 8. A neutral plastic rod is brought in contact with a positively-charged electroscope.