A-day: Due Mon., Mar 31 (Assigned Thurs., Mar 27)
B-day: Due Tues., Apr 1 (Assigned Fri., Mar 28)

2008 Electricity 1

Equation
$F_E = k_C \frac{q_1 q_2}{r^2}$
$E = k_C \frac{q}{r^2}$ $\quad E = F_E q_2$

Variable	Unit	Var Name	Notes
F_E	N	Electric force	Force between to two charges; is a vector.
q	Coulomb (c)	charge	q_1: first charge, q_2: second charge, etc.
k_C		Coulomb's constant	$k_C = 8.99 \times 10^9$
r	m	Separation distance	Distance btwn centers of q_1 and q_2 (must be in m)
e	C	electron	1 e = -1.602×10^{-19} coulombs

1. Give the three basic particles in the atom, where they are located, and their charges (+, -, or neutral).
   Particle: Location: Charge:
   1.
   2.
   3.

2. Opposites attract and like charges repel.
   A) Two protons will:
   B) Two electrons will:
   C) An electron and a proton will:

3. For the three diagrams at the right will they repel or attract?

A) (+) (+) Attract or Repel?

B) (–) (+) Attract or Repel?

C) (–) (–) Attract or Repel?

Use the notes on "Electric Charge and Electric Force" and the notes on "Conversions" for the following.

4. Find the number of electrons gained or lost by –7.3 coulomb object.

5. How much charge do 6.5×10^8 electrons have?

6. A. A 4.5μC charge and a 6.2μC charge are 4.2 mm away from each other. Find the electric force between them.

   B. Is the above force attractive or repulsive?

7. Electric force will increase or decrease?
   A. _____If the distance between two charges decreases.
   B. _____If both of the charges decreases.
   C. _____If the distance increases.
   D. _____If q_1 increases.

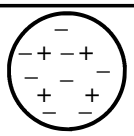
8. Give the difference between an insulator and a conductor, including an example of both.

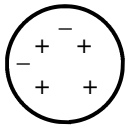
9. Is metal an electrical conductor or an electrical insulator?

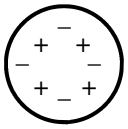
10.Positive	A. A push or pull caused by charges.
11.Negative	B. The units for charge.
12.Neutral	C. When an object has more protons than electrons.
13.Coulombs	D. When an object has an equal number of electrons and protons.
14.Electric force	E. What keeps protons bound in the nucleus of an atom.
15.Strong Nuclear Force	F. When an object has more electrons than protons.

16.Ground	A. The symbol for ground.
17.Arcing	B. Moving electrons.
18.Charge Difference	C. When a spark jumps between two objects.
19.Van de Graff	D. Can accept or give an infinite amount of electrons. Will neutralize charge.
*20.*Electricity	E. A machine that separates charge.
21. 	F. Causes an electric force and charges to move.

22.*What Charge: Positive (+), Negative (–), or Neutral (0)?*

____ 

____ 

____ 

____ 2 protons and 4 electrons

____ 18 protons and 16 electrons

____ A piece of rubber after rubbing it with fur.

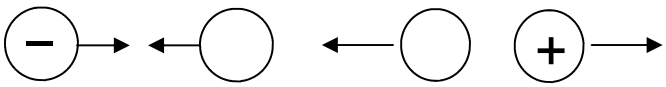
23.A balloon is rubbed against hair. Afterwards it sticks to the wall.

A) Is the balloon attracted or repelled by the wall?

B) Are the balloon and wall oppositely charged or like charged?

24.You walk across a carpet. When you try to touch a door knob a spark jumps between you and the door knob. Why?

25. What are the charges of the second objects?



Attracting *Repelling*

26.An object has a charge of 4.5 C.

A) Is the object positive or negative?
B) Did it gain or lose electrons?
C) If you touch it to ground, will it lose electrons to ground or gain electrons from ground?
D) What will its charge be after it is grounded?

27.Using the object at the right answer the following questions.

A) Did it gain or lose electrons?
B) When grounded, will it gain or lose electrons from ground?
C) Draw a wire grounding it.
D) What will its charge be after grounding?