Physics Semester Exam Review

1. Draw a picture of your understanding of the structure of an atom. What does it look like? What is inside of it? What forces hold it all together? Express what you know using a well-labeled diagram.

2.The charged parts of the atom are the _____ and the _____. The _____ are positively charged and the _____ are negatively charged. The _____ are not charged and thus will not be of importance in this unit.
Structure of the Atom

3. An electrically neutral atom is an atom which _____.

4. An object has 1.0x10^3 excess electrons. What is it's charge?

5. An object has 3.4x10^6 more protons than electrons. What is it's charge?

6. Charged objects interact with one another. One can observe the interactions and infer information about the type of charge present on an object. Complete the following statements to illustrate your understanding of the three types of charge interactions:
a. Oppositely-charged objects _____
b. Like-charged objects _____
c. A charged object and a neutral object will _____

7. Draw a picture of what would happen if you brought a positively charged rod close to an electrically neutral conducting sphere. Would the objects attract or repel each other or neither?

8. A balloon with a charge of 4.0 x 10^-5 C is held a distance of 0.10 m from a second balloon having the same charge. Calculate the magnitude of the repulsive force.

9. Suppose that two equally charged spheres attract each other with a force of 0.492 N when placed a distance of 29.1 cm from each other. Determine the magnitude of the charge of the spheres.

10. When a charge of 8 C flows past any point along a circuit in 2 seconds, the current is _____.

11. When you turn on the room lights, they light immediately. This is best explained by the fact that
    a. electrons move very fast from the switch to the light bulb filament.
    b. electrons present everywhere in the circuit move instantly

12. A circuit is set up such that it has a current of 8.0 amps. What would be the new current if ….

a. … the resistance (R) is increased by a factor of 2?
b. … the resistance (R) is increased by a factor of 4?
c. … the resistance (R) is decreased by a factor of 3?
d. … the battery voltage (ΔV) is increased by a factor of 3?
e. … the battery voltage (ΔV) is decreased by a factor of 2?
f. … the resistance (R) is increased by a factor of 2 and the battery voltage (ΔV) is decreased by a factor of 2?
g. … the resistance (R) is decreased by a factor of 4 and the battery voltage (ΔV) is increased by a factor of 3?

13. Fill in the table below to indicate the manner in which series and parallel circuits differ

Observation	Series	Parallel
If one light bulb goes out, the other light bulbs...		
As the number of resistors is increased the overall current...		
As the number of resistors is increased the overall resistance...		