Electricity Theory Questions

Physics 122 Name:_____
GB Chapter 14, 15 &16 Questions Date:_____
RB Chapter 20 to 26

Introduction

1) Electricity is always on our mind (hint nervous system). T, F, explain.
2) Name the two forms of electricity.
3) What causes static electricity?
4) Describe a situation in which static electricity occurs.
5) Where are electrons located in the atom?
6) What is their charge?
7) What makes current electricity?
8) List some sources of electrons.

Static Electricity

9) Static electricity was being demonstrated as far back as when?
10) What materials were used in these demonstrations?
11) Who methodically studied materials that could attract bits of matter?
12) What materials did William Gilbert study?
13) When glass is wiped across silk, which material: a) gains electrons? b) Looses electrons?
14) As a result of the electrons moving, what charge is formed on: a) the glass b) the silk?
15) When plastic is wiped across fuzzy cloth, which material: a) gains electrons? b) loses electrons?
16) As a result of the electrons moving, what charge is formed on: a) the plastic b) the fuzzy cloth?
17) Since electrons are negatively charged, they make the body to which they move, ___, and the area which they leave becomes ___.
18) What does the law of charges state about the interaction of charges?
19) Apply this law to the sweater - hair situation.

Conductors

20) Define: conductor.
21) What is a common example?
22) Apply this example to your home.
23) Name a conducting solution.
24) Electrons do not move easily between conductors in contact. T, F, explain.

Insulators

25) Define: insulator.
26) What are some common examples?
27) Could a negative charge not build up on a piece of plastic?
28) Would the charge last on the plastic?
29) A piece of plastic can hold many areas of negative charges. T, F, explain.
30) Explain when electrons can move on an insulator.
31) Again, if electrons leave a spot on the insulator, the negative charge there will ___, if electrons move onto that spot on the insulator, the negative charge there will ____.

Charge Balance

32) Explain what charge a material usually has.
33) The structure of the atom can be compared to what enormous area?
34) In the Solar System, the sun represents what part of the atom?
35) What part of the atom is represented by about the planets?
36) What particles are in the nucleus of the atom?
37) What particles circle around the nucleus?
38) In the atom, what particles are usually equal in number?

39) Make a sketch of the atom showing its contents and where they are located in it.
40) Whenever an atom absorbs extra electrons, what happens to the charge balance?
41) As a result, the material becomes ___ charged. Why?
42) A bunch of electrons exert what force on each other?
43) What is a ground?
44) How might it affect the charge on an atom?
45) Why are static charges on paper a problem in printers and photocopiers?
46) How are the static charges on the paper controlled?
47) Whenever an atom loses electrons, what happens to the charge balance?
48) As a result, the material becomes ____charged. Why?

49) Force Fields
50) What type of story often includes force fields?
51) Do force fields actually exist?
52) List some things real force fields do.

Electric Force Fields
53) What type of field surrounds an electric charge?
54) If charges are adjacent, what do their fields do?
55) What is the result of the fields interacting?
56) How can we map the shape of the magnetic field around a magnet?
57) But, how do we see the shape of electric force fields around electric charges?
58) Groups of charges create simple looking electric force fields. T, F,
59) Explain.

Lines of Force
60) What is the reason for drawing "lines of force" around an electric charge?
61) If the lines in the force field diagram are closely spaced, the electric field is ___.
62) There are how many basic shapes of force field diagrams?
63) Sketch the shape of the force field around:
a) an individual positive charge
b) an individual negative charge
c) a pair of positive charges
d) a pair of negative charges.

Van de Graff Generator
64) The behavior of intense electric charges is studied with what device?
65) When electrons leap from the device, they create what?

CRT
66) What does CRT stand for?
67) What particles fly around inside a CRT?
68) How does the CRT create the images we see on its screen?

Direct Current
69) The potential difference of a battery can be compared to what in your house?
70) Current flows from a battery as long as what is unequal at its ends?
71) When both ends of the battery are at the same potential difference, what happens to the current flow?
72) Potential difference is measured in what unit?
73) A current that flows steadily in one direction is called what?

Voltaic Cells
74) The process of obtaining electrical current from chemical reactions was
75) discovered accidentally in the 1800's by whom?
76) What is a Voltaic cell?
77) What are the contents of a Voltaic cell?

78) How can we a Voltaic cell (dry cell) to so some work for us?
79) Contrast the terms "battery" and "dry cell".
80) Is a D cell a battery?
81) What about a 9 V battery?
82) Name four common sizes of dry cells and their voltages.
83) Name two brands of rechargeable household batteries.

Photoelectric Effect

84) How does light affect a photoelectric material?

Electric circuit

85) Name the parts of an electric circuit.
86) What is the purpose of the switch?
87) Current is measured in what unit?

Types of Electric Circuits

88) Name the two types of circuits.
89) Which type has just one route for the current?
90) Which one has different branches for the current to go through?

Electrical Power

91) What does the power rating of an electrical device tell us?
92) What is the unit for power?

Ohm's Law

93) Define: resistor.
94) What does a resister do to the current flowing through it?