

1. Describe how fast individual electrons move in a circuit once a circuit is completed and a light goes on.
  - a. The “drift” along very slowly, at a snail’s pace
2. A Joule per coulomb is also called a \_\_\_\_\_.
  - a. Volt
3. A synonym for voltage you should know is called \_\_\_\_\_.
  - a. Electric potential
4. What is given the symbol R and what units are used for it?
  - a. Resistance, it’s measure in ohms (abbreviated  $\Omega$ )
5. Rate of energy consumption is called \_\_\_\_\_.
  - a. Power
6. Another name for a Joule per second is a \_\_\_\_\_.
  - a. Watt
7. Give two units we use for energy and state which is the scientific version and which is the practical one?
  - a. Joules is the scientific version, but kW-hr is the practical one used by ComEd
8. About how much does ComEd charge you for a kW-hr?
  - a. 10 cents
9. How to you place an ammeter in a circuit and does is have a lot or a little resistance? Why?
  - a. In series (so all charges are counted); little resistance (or it would change the circuit)
10. How to you place a voltmeter in a circuit and does is have a lot or a little resistance? Why?
  - a. In parallel (across) a resistor. Voltage only drops ACROSS a resistor. A lot or resistance (otherwise it would short the circuit and no current would pass through the original resistor).
11. In the shopping analogy, what does a slow cashier represent?
  - a. High resistance (since the cashier resists the flow of shoppers!)
12. In the shopping analogy, what does adding a second lane (cashier) represent?
  - a. Adding a resistor in parallel
13. Describe how you know two resistors are in parallel in a schematic.
  - a. When charge can flow into EITHER one.
14. Describe how you know two resistors are in series in a schematic.
  - a. When charge must flow into both, first one THEN the other.
15. What is a Coulomb per second? (be specific and descriptive)
  - a. An amp...the rate of flow of charge; it’s our measurement of current.
16. What is the resistance like for a very thin copper wire?
  - a. High since the job of a wire is to move charge and very thin wires lack enough free electrons to easily move charges.
17. Name and describe five schematic components we typically use in this class.
  - a. Battery (wide end is positive). Wire (line). Resistor (jagged line). Ammeter (Wire with circled A). Voltmeter (Wire with circled V and TWO leads)
18. Name the formula for finding power in a circuit
  - a.  $P = iV$
19. Name the formula relating power to energy and time
  - a.  $P = E/t$
20. State ohm’s law and what does it tell us about where voltage drops occur?
  - a.  $\Delta V = iR$ ; It tells us voltage drops only happen where there is resistance and current is flowing
21. Think hard, and try this in your head: What is the equivalent resistance of three  $3\Omega$  resistors in parallel?
  - a.  $1\Omega$
22. Using this ( $1/R_e = 1/R_1 + 1/R_2$ ) for parallel resistors of  $2\Omega$  and  $3\Omega$ , we find  $1/2 + 1/3 = 5/6$ . What’s the equivalent resistance of these two resistors?
  - a.  $6/5$ , or 1.2...DON’T FORGET: There are two steps involving reciprocals!
23. If electrons flow left then what is the direction of current?
  - a. To the right (current is defined as the flow of POSITIVE charge!)
24. If resistor  $A > B$  and A and B are in parallel, what can you say about  $R_e$  for sure?
  - a. It’s less than B!...or  $R_e < B$  (adding a cashier can ONLY speed things up)