**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Chapters 20-21 Practice Test 2016-2017**

**I. A. Matching Part 1 (answers may be used twice or not at all):**

A. current

B. potential difference

C. power

D. resistance

E. energy

1. kilowatt-hour

2. volt

3. ohm

4. watt

5. Joules per Coulomb

 **B. Matching Part 2 (answers may be used twice or not at all):**

A. power

B. drift velocity

C. resistance

D. current

E. charge

6. ampere

7. coulomb

8. Joules per second

9. meters per second

10. Coulombs per second

**II. Multiple Choice:** Select the one best answer for each question.

11. In a circuit, the indicated direction of the current is in the

 A. same direction as the net electron flow.

 B. direction from the negative battery terminal to the positive battery terminal.

C. opposite direction as the net electron flow.

D. is in the same direction that protons are moving through the wire.

12. If the potential difference across a resistor is doubled,

A. only the current is doubled.

B. only the current is halved.

C. only the resistance is doubled.

D. only the resistance is halved.

E. both the current and resistance are doubled.

13. Three identical light bulbs are connected to a battery. What will happen if the top bulb burns out?

V

 A. All the bulbs will go out.

 B. The light intensity of the other two bulbs will decrease

 (but they won't go out).

 C. The light intensity of the other two bulbs will increase.

 D. The light intensity of the other two bulbs will remain

 the same.

E. More current will be drawn from the battery.

14. Which of the following appliances consumes the most power when operating?

A. Appliance #1: 120 V 1.0 A

B. Appliance #2: 240 V 0.5 A

C. Appliance #3: 240 V 2.0 A

D. Appliance #4: 120 V 3.0 A

15. When we measure the potential difference across a resistor, a multimeter is connected to the circuit in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ with the resistor so it will have the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A. series, same current flowing through it as the resistor

B. series, same potential difference across it as the resistor

C. parallel, same current flowing through it as the resistor

D. parallel, same potential difference across it as the resistor

16. Which of these equations is Ohm’s Law?

 A. V = IR B. I = VR C. R = IV D. P = IV

17. Why is thicker wire required by law for circuits with higher current?

 a. Thicker wire has lower voltage

 b. Thicker wire has higher resistance

 c. Thicker wire has higher voltage

 d. Thicker wire has lower resistance

 e. Thicker wire has more mass

18. Home circuits are wired…

 a. In series

 b. In parallel

 c. Sometimes in series, and sometimes in parallel

 d. In complex circuits that combine series and parallel

19. One reason for attaching ground wires to appliances is…

 a. Appliances won’t work without a way for the current to return to the ground.

 b. In any circuit, there is always energy that does not get used, and it needs a place to go.

 c. To safely get rid of any excess charge that might accidentally build up on the appliance.

 d. To reduce the chance of the appliance causing a shock during a lightning storm.

20. A short circuit happens when…

 a. Current travels through a circuit without encountering a resistor

 b. A new resistor is added to a circuit, closer to the voltage source

 c. There is a gap in a circuit between the voltage source and the ground

 d. The distance between resistors is very small

21. An electrical fuse works by:

 a. Suddenly increasing in resistance in response to too much current flowing.

 b. Providing a safe path to the ground for excess current to leave the circuit.

 c. Melting and vaporizing to produce a gap in an electrical circuit.

 d. Connecting two parts of an electrical circuit to spread out excess heat.

22. Which of these is not a measure that can help prevent electrical fires?

 a. Making sure that wires are thick enough for the current that they are carrying

 b. Adding a fuse to a circuit.

 c. Using an appropriately sized circuit breaker

 d. Increasing the resistance of the wires in a circuit

23. Current is a measure of:

A. force that moves a charge past a point

B. resistance to the movement of a charge past a point

C. energy used to move a charge past a point

D. amount of charge that moves past a point per unit of time

E. speed with which a charge moves past a point

24. In a simple circuit consisting of a battery and a resistor, if the resistance of the resistor increases, the current through the resistor will:

A. increase B. decrease C. stay the same

25. Consider a circuit consisting of a battery and two resistors connected in parallel with one another. If a third identical resistor is added in parallel, the current through the two original resistors will:

A. increase B. decrease C. stay the same

26. Consider a circuit consisting of a battery and two resistors connected in series. If a third, identical resistor is added in series, the current through the two original resistors will:

 A. increase B. decrease C. stay the same

27. In a string of holiday lights, when one bulb burns out the rest of the bulbs stay lit, the bulbs must be connected in

A. series B. parallel

28. A bird can “sit” on a high voltage wire without suffering any ill effects because:

 A. Power lines are coated with an insulating layer of material.

 B. Parts of the wire touched by the bird have essentially equal potential.

C. Power lines do not transmit current until someone’s appliance turns on.

 D. Any excess charge leaks from the bird’s pointy feather fibers into the surrounding air.

**III. Problems:**

1. A cordless drill operates at a current of 7A on a standard 120V household circuit.

a. How many Coulombs of charge pass through the drill during one hour of use?

b. How much energy does it use during this hour?

2. A 120V household circuit is wired in parallel, and it is connected to a 15A circuit breaker. A 1,500W hair dryer, a 10W LED light fixture, and a 120W fan are all plugged into this circuit. Will you be able to run all of the devices at the same time?

Provide numerical evidence to support your answer.

3. A. Calculate the total equivalent resistance of this circuit.

18.0 V

6.00 

9.00 

4.50 

B. Calculate the current flowing through the battery.

4. A. Calculate the total equivalent resistance of this circuit.

36.0 V

9.00 

12.50 

7.40 

B. Calculate the total current flowing through this circuit.

C. Calculate the current flowing through the 7.40- resistor.

D. Calculate the power consumed by the 7.40- resistor.

5. A. Calculate the total equivalent resistance of this circuit.

12.0 

24.0 

5.30 

18.0 V

B. Calculate the total current flowing through this circuit.

C. Calculate the potential difference across the 5.30- resistor.

D. Calculate the current flowing through the 24.0- resistor.

E. Calculate the power consumed by the 12.0- resistor.