Instructions

- You have 20 minutes to complete this test.
- You may write your answers directly in the test.
- You may use any notes or resources you have created or collected.
- You may use a calculator and scratch paper if necessary.
- Good Luck!

Test Questions

1. Which of the following is not a conductor?
   a. Aluminum
   b. Copper
   c. Distilled Water
   d. Sea Water

2. If you have four light bulbs all with different voltages and filaments of the same length, which one will have the thickest filament?
   a. 10-W
   b. 30-W
   c. 60-W
   d. 120-W

3. Which of the following is correct for a light bulb?
   a. The light bulb has no resistance.
   b. The resistance of the bulb decreases as it starts to glow.
   c. The resistance of the bulb stays constant as the current voltage increases.
   d. None of the above.
4. Which light bulb(s) in the image above are lit?
   a. Light Bulb A
   b. Light Bulb B
   c. Light Bulb C
   d. Light Bulb D

5. When the switch in the circuit above is closed, the light bulb will glow immediately. What is the average speed of the electrons in the wire?
   a. Less than 1 cm/s.
   b. The speed of light.
   c. The speed of sound waves in the wire.
   d. The electrons do not move at all.

6. Which of the following types of wire with the same thickness and length will have the greatest resistance?
   a. Aluminum
   b. Cooper
   c. Gold
   d. Lead

7. Which of the following is a device that converts chemical energy into electrical energy?
   a. Ammeter
   b. Battery
   c. Generator
   d. Motor

8. Which of the following is a unit of measure for resistance?
   a. Ampere
   b. Ohm
   c. Volt
   d. Watt

9. Which of the following is a device used to measure current?
   a. Ammeter
   b. Ammeter
   c. Potentiometer
   d. Voltmeter
10. Which of the following is a device used to measure potential difference?
   a. Ammeter
   b. Ampmeter
   c. Potentiometer
   d. Voltmeter

11. What is the source of all magnetism?
   a. tiny pieces of iron
   b. ferromagnetic materials
   c. moving electrical charge
   d. tiny domains of aligned atoms

12. Which of the following is true for a bar magnet that has been cut in half?
   a. The pieces will no longer be magnetized.
   b. Both pieces will be only the South Pole.
   c. One piece will be the North Pole the other piece will be the South Pole.
   d. Each piece will be a complete magnet with a North Pole and a South Pole.

13. A compass is placed next to a wire that is oriented vertically so that it passes through the page as shown in the diagram above. Which way is the current passing through the wire?
   a. Up
   b. Down
   c. East
   d. West

Use the drawing below to answer questions #14-#17

14. What is I1?
   a. 1.00 A
   b. 3.00 A
   c. 4.00 A
   d. 7.00 A
15. What is $V_3$?
   a. 4.00 V  
   b. 8.00 V  
   c. 16.00 V  
   d. 24.00 V

16. What is $I_2$?
   a. 2.00 A  
   b. 3.00 A  
   c. 4.00 A  
   d. 7.00 A

17. What is $V_2$?
   a. 4.00 V  
   b. 8.00 V  
   c. 16.00 V  
   d. 24.00

Use the drawing below to answer questions #18-#22

18. What is the current passing through Resistor R?
   a. 1.00 A  
   b. 2.00 A  
   c. 4.00 A  
   d. 7.50 A

19. What is the voltage drop across Resistor R?
   a. 6.00 V  
   b. 8.00 V  
   c. 16.00 V  
   d. 30.00 V

20. What is the current passing through the battery?
   a. 1.00 A  
   b. 2.00 A  
   c. 4.00 A  
   d. 7.50 A
21. What is the voltage drop across resistor $R_1$?
   a. 6.00 V
   b. 8.00 V
   c. 16.00 V
   d. 30.00 V

22. What is the total resistance of the external circuit?
   a. 4.00 $\Omega$
   b. 12.00 $\Omega$
   c. 15.00 $\Omega$
   d. 30.00 $\Omega$

23. How many batteries are present in the above circuit?
   a. Zero
   b. One
   c. Two
   d. Three

24. What does the A represent in the above circuit?
   a. Ammeter
   b. Ampmeter
   c. Potentiometer
   d. Voltmeter

25. In the circuit shown, which light bulb will be the brightest?
   a. Light Bulb #1
   b. Light Bulb #2
   c. Light Bulb #3
   d. They will all be the same

26. If only Switch #1 is open, what will happen to the current in Bulb #1?
   a. Become Zero
   b. Decrease
   c. Become Greater
   d. Stay the same
27. If only Switch #1 is open, what will happen to the current in Bulb #2?
   a. Become Zero
   b. Decrease
   c. Become Greater
   d. Stay the same

28. If only Switch #1 is open, what will happen to the current in Bulb #3?
   a. Become Zero
   b. Decrease
   c. Become Greater
   d. Stay the same

29. If only Switch #2 is closed, what will happen to the brightness of Bulb #1?
   a. Become Brighter
   b. Become Dimmer
   c. Go Out
   d. Stay the same

30. If only Switch #2 is closed, what will happen to the brightness of Bulb #3?
   a. Become Brighter
   b. Become Dimmer
   c. Go Out
   d. Stay the same
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1 | C |   | 15 | C |   | 29 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2 | D |   | 16 | D |   | 30 | C |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3 | D |   | 17 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4 | B |   | 18 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 5 | A |   | 19 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 6 | D |   | 20 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 7 | B |   | 21 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 8 | B |   | 22 | C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 9 | A |   | 23 | C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 10| D |   | 24 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 11| C |   | 25 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 12| D |   | 26 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 13| B |   | 27 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 14| C |   | 28 | C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |