

Working with Electricity

Name _____

Class _____

Electrical Safety

1. When lightning hits an area where there is sand and rock, these **glass-lined tubes** can be created. They are called ...
 - A. stalagmites
 - B. stalactites
 - C. fulgurites
 - D. fusinites
2. When electricity takes a path that is unintended, it is called a ...
 - A. short circuit
 - B. short pathway
 - C. incomplete pathway
 - D. incomplete circuit
3. Which of the following is **most likely** enough electricity to kill you...
 - A. .01A
 - B. .01V
 - C. 10A
 - D. 10V
4. Evan was inspecting the wiring in a new house and found that the **green wire** had not been connected properly in the electrical panel. The wiring did not pass safety inspection because the ...
 - A. panel had a short circuit
 - B. green wire was the hot wire
 - C. electrical circuits were overloaded
 - D. electrical outlets were not grounded
5. A power line has snapped in an ice storm. One end landed on a car, with the driver still inside. The driver will **not be electrocuted** as long as he ...
 - A. keeps calm and moves slowly out of the car
 - B. makes sure he doesn't touch the wire as he gets out
 - C. stays inside the car until help arrives
 - D. doesn't step in any water as he gets out
6. The **dangers of electrical shock** can vary depending on the situation. Which of the following would be the most dangerous (most likely to get a nasty shock!) ...
 - A. Touching an electrified fence on a hot summer day while wearing running shoes.
 - B. Touching an electrified fence when you are barefoot in a rainstorm.
 - C. Touching a metal fence on a hot summer day while wearing running shoes.
 - D. Touching a metal fence when you are barefoot in a rainstorm.
7. A fuse and a circuit breaker interrupt a circuit when there is too much current flowing. The disadvantage of the fuse is that it ...
 - A. can be easily repaired
 - B. has to be replaced when it works
 - C. doesn't work on really small overloaded circuits
 - D. can be used over and over – taking a long time to wear out

Controlling the Flow Of Electrical Current


8. Electricity can be conducted by a gas. A good example of this is neon, which glows
- A. purple
 - B. orange-pink
 - C. yellowish-white
 - D. red
9. These types of conductors have no resistance to electron flow and therefore are considered to be perfect conductors. They are ...
- A. metallic conductors
 - B. magnetic conductors
 - C. superconductors
 - D. superior conductors
10. A door can be used as a model to show how difficult it would be for electrons to flow. The door model represents ...
- A. voltage
 - B. current
 - C. resistance
 - D. amperage
11. Solutions can also be resistors. The more charged particles in a solution,
- A. the more molecules it has
 - B. the more resistance it has
 - C. the less resistance it has
 - D. the fewer molecules it has
12. A lie detector indicates that a person is telling a lie because there is
- A. a decrease in resistance
 - B. an increase in resistance
 - C. no change in conductivity
 - D. a decrease in conductivity
13. A variable resistor is a control device that allows you to change the resistance in a circuit. It is also called a
- A. rheohm
 - B. rheostat
 - C. thermostat
 - D. thermocouple

Modeling and Measuring Electricity

14. A waterfall can be used to model current, voltage and resistance. If the waterfall has a large number of very large boulders, it models greater ...
- A. voltage
 - B. current
 - C. amperage
 - D. resistance
15. A certain condition needs to be met in order to prove the mathematical link between voltage, current and resistance as represented by Ohm's Law. The condition is that
- A. temperature must be constant
 - B. measurement must be accurate
 - C. calculations must be precise
 - D. resistance must be created

16. Using Ohm's Law ($R = V / I$) calculate how much current is created when a **30 V** battery creates the current through a **15 Ω** resistor. Use this shortcut formula to solve the problem
- A. **0.5 A**
 - B. **2 A**
 - C. **45 A**
 - D. **1.5 A**
17. Voltage is the potential difference across two points. Many electricians refer to the potential difference across a resistor or device as ...
- A. **micrometer**
 - B. **voltage drop**
 - C. **resistance**
 - D. **voltmeter**
18. Current is the rate of flow of charged electrons in a conductor, and is measured in ...
- A. **amperes**
 - B. **volts**
 - C. **ohms**
 - D. **milli-volts**
19. Resistance varies with the length, length and thickness of the wire used for resistance. In general, resistance increases as the
- A. **length and thickness increases**
 - B. **length and thickness decreases**
 - C. **length increases and thickness decreases**
 - D. **length decreases and the thickness increases**

Electrical Circuits

20. Every circuit has four basic parts. The component that controls the flow of the electricity is the ...
- A. **source**
 - B. **conductor**
 - C. **switch**
 - D. **resistance, or load**
21. Symbols are used to represent the electrical components in a schematic diagram. This symbol  is used to represent ...
- A. **amps**
 - B. **automatic**
 - C. **ammeter**
 - D. **a single cell**
22. A circuit that has only one pathway for the electricity to flow is called a
- A. **series circuit**
 - B. **parallel circuit**
 - C. **integrated circuit**
 - D. **schematic circuit**
23. In a parallel circuit, when additional resistors are added, the total resistance of the circuit is
- A. **unchanged**
 - B. **increased**
 - C. **decreased**
 - D. **doubled**

24. Solid state components are used in many electronic devices. These are made from a solid material that has no moving parts. They are also called ...
- A. resistors
 - B. transistors
 - C. micro-components
 - D. photo-conductors
25. A microcircuit is also called an integrated circuit because they are made up of microscopic ...
- A. cells and batteries
 - B. conductors and insulators
 - C. series and parallel circuits
 - D. transistors and resistors

Draw a **schematic** diagram using: 2 batteries, 2 lamps, 1 motor, and 4 switches

The circuit you make should enable each lamp and the motor to be switched on and off separately, without affecting the other loads, and also allows for all of the loads to be turned on and off all at once.

Draw a **schematic** diagram using: 3 batteries, 3 lamps, 1 variable resistor, and 1 switch. The circuit you make should be able to adjust the brightness of the lamps and switch them all on and off all at once.

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
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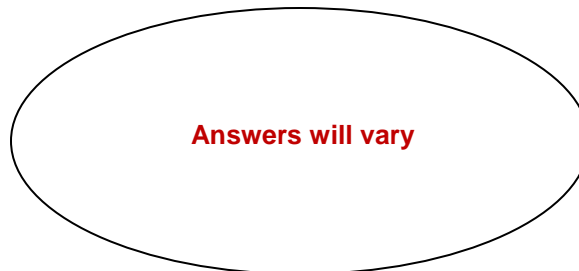
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