

**Chapter 01 Electrical Safety**

1. One of the most important things for a technician to remember when dealing with electrical circuits is to \_\_\_\_\_ them.

- a. Avoid
- b. Respect
- c. De-energize
- d. Disconnect

**ANSWER:**

b

2. An electrical shock occurs when all or part of a person's body \_\_\_\_\_ electrical current.

- a. Becomes the path for
- b. Is insulated against
- c. Touches insulated conductors carrying
- d. Is near equipment using

**ANSWER:**

a

3. Which of the following can occur when electrical current flows through the human body?

- a. Experience a stinging sensation
- b. Serious injury
- c. Death
- d. All the choices are possible

**ANSWER:**

d

4. Which of the following voltages will technicians work in close proximity to in the residential HVAC field?

- a. 24 volts
- b. 120 volts
- c. 240 volts
- d. All of the choices are correct

**ANSWER:**

d

5. A person will experience electric shock if their body becomes part of an electrical circuit by making contact with the \_\_\_\_\_.

- a. L1 and L2 conductors in a disconnect switch
- b. L1 and neutral conductors on a furnace
- c. L2 and grounding conductors on a condensing unit
- d. All of the choices will result in electrical shock

**ANSWER:**

d

6. Which of the following paths of electrical current flow through the body has the highest risk of causing severe injury or death?

- a. From the thumb to the index finger on the right hand
- b. From the left hand to the left elbow
- c. From the right hand to the left hand
- d. From the right knee to the right foot

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**ANSWER:**

**c**

7. The risk of serious injury or death from electrical shock increases if the path of electrical current flow crosses or comes near the \_\_\_\_\_.

- a. Arm
- b. Heart
- c. Leg
- d. Shoulder

**ANSWER:**

**b**

8. Electrical current flowing near the heart can cause a potentially fatal condition in which the heart flutters in a manner that ceases to pump blood through the body known as \_\_\_\_\_.

- a. Cardiomyopathy
- b. Ventricular tachycardia
- c. Ventricular fibrillation
- d. Cardiac ablation

**ANSWER:**

**c**

9. What is the main difference between a conductor used as a grounding connection and a conductor used as a neutral connection?

- a. Current flows through the grounding conductor and not the neutral conductor during normal circuit operation
- b. The neutral conductor is there for safety and the grounding conductor is part of the normal operating circuit
- c. The grounding conductor is for safety and does not normally carry current while the neutral conductor is a current carrying part of the circuit.
- d. Grounding conductors are optional while neutral conductors are required for all electrical circuits

**ANSWER:**

**c**

10. Death from electric shock is possible when current flow through the body reaches \_\_\_\_\_.

- a. 0.015 ampere
- b. 15 amperes
- c. 1,000 milliamperes
- d. 0.5 ampere

**ANSWER:**

**a**

11. Electromotive force is \_\_\_\_\_.

- a. Measured in volts
- b. The force used to measure locomotive power
- c. Measured in amperes
- d. A measurement of electrical power

**ANSWER:**

**a**

12. Electrical current leaving the intended path and flowing through the air, often in an explosive and violent nature, best defines \_\_\_\_\_.

- a. Ground fault

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- b. Inductive reactance
- c. Arc flash
- d. Atmospheric conductions

**ANSWER:**

c

13. An arc flash can be caused by which of the following conditions?

- a. Dropping tools into electrical equipment
- b. Damaged insulation on conductors
- c. Loose or improper conductor connections
- d. All of these conditions can cause arc flash

**ANSWER:**

d

14. Which of the following are ways technicians can reduce the risk of being injured by an arc flash?

- a. Wear appropriate personal protective equipment
- b. Turn off electrical power to the equipment when possible
- c. Work using safe practices and insulated tools
- d. All of the choices are correct

**ANSWER:**

d

15. Which of the following choices is a potential hazard technicians face when working with electricity?

- a. Electrical shock
- b. Arc flash and burns
- c. Fire
- d. All of the choices are correct

**ANSWER:**

d

16. Which of the following choices is the best course of action for a rescuer assisting a shock victim who is still in contact with the source of electrical energy?

- a. Assess the victim and begin CPR if necessary
- b. Take hold of the victim and pull them off the electrical energy source
- c. Turn off the source of electrical energy if the disconnect switch is near by
- d. Call 911 and wait for the first responders to arrive before taking any action

**ANSWER:**

c

17. What first aid measure should be administered as soon as possible for a shock victim that is not breathing nor can a heartbeat be detected?

- a. Cardiopulmonary resuscitation
- b. Cardiovascular restoration
- c. Cardio muscular reconditioning
- d. All of the choices are correct

**ANSWER:**

a

18. The minimum standards that must be met for the safe installation of electrical systems is specified by the \_\_\_\_\_.

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- a. OSHA
- b. NEC
- c. AHRI
- d. ACCA

**ANSWER:**

b

19. How often is the National Electrical Code revised?

- a. Every year
- b. Every five years
- c. Every eight years
- d. Every four years

**ANSWER:**

d

20. Which article in the National Electrical Code specifically covers air conditioning and refrigeration equipment?

- a. Article 540
- b. Article 440
- c. Article 400
- d. Article 300

**ANSWER:**

b

21. The National Electrical Code is published by the \_\_\_\_\_.

- a. American Electricity Safety Association
- b. U.S. Department of Energy
- c. National Fire Protection Association
- d. National Electrical Code Council

**ANSWER:**

c

22. Which conductor in an electrical circuit will allow current to flow back to the ground instead of through the person?

- a. Neutral conductor
- b. Power conductor
- c. Line conductor
- d. Grounding conductor

**ANSWER:**

d

23. What should a technician do if they need to plug a grounded metal drill with a three-prong plug into an older receptacle made for two-prong plugs?

- a. Break off the third (ground) prong so the plug will fit the receptacle
- b. Use a grounding adapter to connect the drill to the receptacle
- c. Tell the customer the work cannot be completed
- d. Purchase a portable generator to power the drill

**ANSWER:**

b

24. An electrical device that will disconnect the power if an electrical current leak is detected to the ground best describes

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a(n) \_\_\_\_\_.

- a. Circuit breaker
- b. Arc fault circuit interrupter
- c. Grounding current overload
- d. Ground fault circuit interrupter

**ANSWER:** d

25. What type of power tools have two-prong plugs because they do not require electrical grounding connections?

- a. Double insulated power tools
- b. Metal bodied power tools
- c. Single insulated power tools
- d. Non-insulated power tools

**ANSWER:** a

26. Which of the following electrical devices is specifically designed to protect people against electrical shock?

- a. Arc fault circuit interrupters
- b. Ground fault circuit interrupters
- c. Fuses
- d. Circuit breakers

**ANSWER:** b

27. Which of the following electrical devices is designed to protect electrical circuits from excessive current flow?

- a. Arc fault circuit interrupters and ground fault circuit interrupters
- b. Thermal overloads and fuses
- c. Fuses and circuit breakers
- d. Ground fault circuit interrupters and circuit breakers

**ANSWER:** c

28. Which of the following conditions could occur if a fuse or circuit breaker with too large of a current rating is used to protect a circuit?

- a. Conductors could overheat
- b. Fire
- c. Equipment damage
- d. All of these conditions could occur

**ANSWER:** d

29. Arc flash circuit interrupters are electrical devices designed to protect structures from fires started by electrical arcs caused by \_\_\_\_\_.

- a. Loose wiring connections
- b. Faulty or damaged electrical equipment
- c. Frayed wiring
- d. All of the choices are correct

**ANSWER:** d

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_  
: \_\_\_\_\_ : \_\_\_\_\_ e: \_\_\_\_\_

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30. What device should a technician use on a jobsite to prevent accidental energizing of circuits or equipment that should remain de-energized for safety?

- a. Lockout tag-out device
- b. Protective circuit interrupter
- c. Piece of tape over the circuit breaker
- d. Note posted over the circuit breaker

**ANSWER:**

a