Basic Electricity

RV 8.12.16

PLEASE DO NOT BOOKMARK ANY ANYTIMECE WEBPAGES!

Our system will remember the last page you viewed when logging out and back in but please DO NOT exit out when taking a test. Your place will NOT be saved.

How to take this course.

1. Download and Print the test questions.

2. Login to your account with your ID and password.

3. Viewing your status page, scroll down and click on "Click here to start this course".

4. Begin viewing the web pages. Refer to your printed test to find the correct answers. The questions track the web pages.

5. As you find the answers, circle them on your printed copy.

6. At the end of each section, you'll enter the quiz which is the same as your printed test. Refer to your circled answers when actually answering the quiz on the web.

7. Upon passing, you will proceed to the next section. If failed to pass, you will be moved to the beginning of that section for more review.

- ***Mobile users*** *– Many current mobile devices are compatible with AnytimeCE and will probably work. If not, use a desktop or laptop computer to complete your course.*
- ***WA. Electricians*** *– WA L&I require all online test questions and answers to be randomized. Be sure to answer all of the test questions on your printed copy.*

Quiz 1

1. Ben Franklin lived in the _____.
- 1700's
- 1800's
- 1900's

2. What denomination of US Currency is Ben Franklin's likeness on?
- $20
- $50
- $100

3. Which device is Ben Franklin known to have invented?
- Cotton Gin
- Lightning rod
- Horseless carriage

4. Ben Franklin invented Bifocal Glasses.
- True
- False

5. Ben Franklin was an advocate for public building safety codes.
- True
- False

6. Nikola Tesla immigrated from _____.
- Croatia
- Serbia
- Russia

7. Approximately how many inventions did Nikola Tesla patent?
- 300
- 700
- 1700

8. Nikola Tesla worked with Thomas Edison and both were long time advocates of DC power.
- True
- False

9. Which electrical power system did Nikola Tesla end up favoring?
- AC
- DC

10. AC means _____.
- air conditioning
- alternative current
- alternating current
- alternating capacitance

11. Thomas Edison lived in the _____.
- 1700's
- 1800's
- 1800's – 1900's
- 1900's

12. Did Thomas Edison develop the first light bulb?
- Yes
- No

13. After inventing the phonograph, Thomas Edison worked with George Eastman to invent _____.
- the light bulb
- the phonograph
- the telephone
- motion pictures

14. George Westinghouse was primarily responsible for _____.
- AC power transmission
- DC power transmission
- steam engine development
- telegraphs

15. Approximately how many patents did George Westinghouse hold?
- 236
- 2854
- 400

16. A well-known invention by George Westinghouse was _____.
- the air brake
- the light bulb
- turbines
- gas lighting

17. George Westinghouse was a supporter of DC Electricity.
- True
- False

18. The Moving Iron Meter was developed as what type of instrument?
- Volt meter
- Amp meter

19. The rapid increase in the use of electricity at the end of the 1800's saw a rapid increase in _____.
- electrical fires
- electrocutions
- electrical poisonings
- birth defects

20. As a result, the first _____ was formulated in 1897.
- Electrical Fire Code
- National Electrical Code
- Fire Safety Code
- Electrical Poisoning Code

21. Georg Simon Ohm was able to define the relationship between voltage, current, and resistance, which represented the true beginning of electrical circuit analysis.
- True
- False

Quiz 2

1. An electron has a _____ charge.
- positive
- negative
- neutral

2. In a stable atom, the number of positively charged particles is _____ the number of negatively charged particles.
- equal to
- greater than
- less than

Basic Electricity

RV 8.12.16

3. The positively charged particle of an element is _____.
- an atom
- an electron
- a proton
- a neutron
- none of the answers provided

4. The center of the atom, the nucleus, is made up of the following:
- A. electrons
- B. protons
- C. neutrons
- D. all of the answers provided
- E. only B and C

5. The electrons in the outer shell are known as _____.
- valence electrons
- outer orbit electrons
- M3 level electrons
- none of the answers provided

6. Materials that easily move electrons are _____.
- conductors
- insulators
- resistors
- all of the answers provided

7. Atoms that have received an extra electron are known as _____.
- depleted atoms
- charged atoms
- overcharged atoms
- full atoms

8. If a positive and negative body are joined together by a copper wire, the following would happen:
- an atomic explosion
- nothing
- electrons would move in the wire from the negative charged body to the positive charged body
- electrons would move in a wire from the lower charged body to the higher charged body

9. Which of the following is NOT an insulator?
- electrical tap
- copper wire
- gloves
- glass

10. Corrosion on the terminal is not desired because it _____.
- 1. acts as an insulator, creates resistance which results in heat at the terminal
- 2. discolors the wire's insulation
- 3. makes a system look old
- 4. allows too much electricity to flow

11. Like charges _____.
- repel
- attract
- have no effect on each other
- none of the answers provided

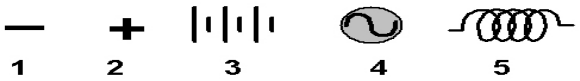
12. Which ways can electricity be produced?
- Chemical (batteries)
- Thermal
- Photo-electric
- Magnetically generated
- All of the answers provided

13. The ANODE in a battery is _____.
- positively charged
- negatively charged
- neutrally charged

14. The CATHODE in a battery is _____.
- positively charged
- negatively charged
- neutrally charged

15. An alkaline battery would use _____ as a base.
- alklinous
- sulfuric acid
- formic acid
- potassium hydroxide

16. A wet cell will have a _____ instead of a paste between the two plates.
- solid
- liquid
- gas
- electromagnetic sponge material



17. Which of the above symbols represents a negative electron or a Cathode?
- 1
- 2
- 3
- 4
- 5

18. Which of the above symbols represents a positive proton or Anode?
- 1
- 2
- 3
- 4
- 5

19. Which of the above symbols represents a battery or direct current?
- 1
- 2
- 3
- 4
- 5

20. Magnets are surrounded by lines of force that are called flux.
- True
- False

21. As the current increases in a wire, the strength of the magnetic field _____.
- decreases
- does not change
- increases
- is not influenced by current flow

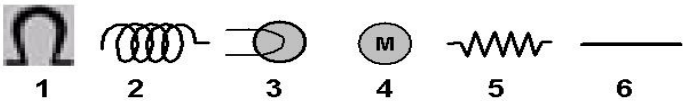
22. When a wire is moved through a magnetic field, electricity will begin flowing in the wire.
- True
- False

23. When generating electricity, an armature coil is needed because the coil is _____.
- a rotating loop of wire
- a stationary loop of wire
- a rotating magnet
- a stationary magnet

Quiz 3

1. Which of the following is not a basic part of an electric circuit?
- Fuse
- Source of Power
- Load
- Switch
- Conductors

2. The units used to measure resistance are _____.
- Ohms
- Volts
- Amps



3. Which of these symbols represents OHMS?
- 1
- 2
- 3
- 4
- 5

4. Which of these symbols represents a MOTOR?
- 1
- 2
- 3
- 4
- 5

5. Which of these symbols represents a RESISTANCE HEATER?
- 1
- 2
- 3
- 4
- 5

6. Which of these symbols represents LIGHT?
- 1
- 2
- 3
- 4
- 5

7. In a series circuit, how many paths are there for current to flow?
- one path
- two separate paths
- three separate paths

8. In a Parallel circuit, how many paths are there for current to flow?
- one path
- two or more separate paths

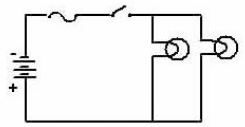
---

9. A series/parallel circuit is represented by illustration _____.
- 1
- 2
- 3

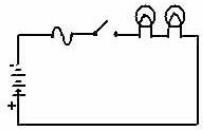
10. A parallel circuit is represented by illustration _____.
- 1
- 2
- 3

11. A series circuit is represented by illustration _____.
- 1
- 2
- 3

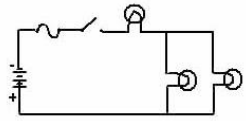
1



2



3



---

12. A fuse is added to the circuit to help protect the other loads.
- True
- False

Quiz 4

1. The major proven problem with the transmission of voltages over long distances is _____.
- transmission lines overheating
- resistance in the wire and resulting voltage drops
- obtaining right of way for access
- magnetic flux lines causing cancer
- vulnerability to terrorist attacks

2. After power is transmitted from the hydroelectric dam to your home, generally what is the electrical voltage coming into your home?
- 1300 volts
- 9 volts
- 240 volts
- 110 volts

3. The ground buss bar is labeled _____.
- A
- B
- C
- D
- E

4. The L1 buss bar is labeled _____.
- A
- B
- C
- D
- E

5. The 120v breaker is labeled _____.
- A
- C
- D
- E
- F

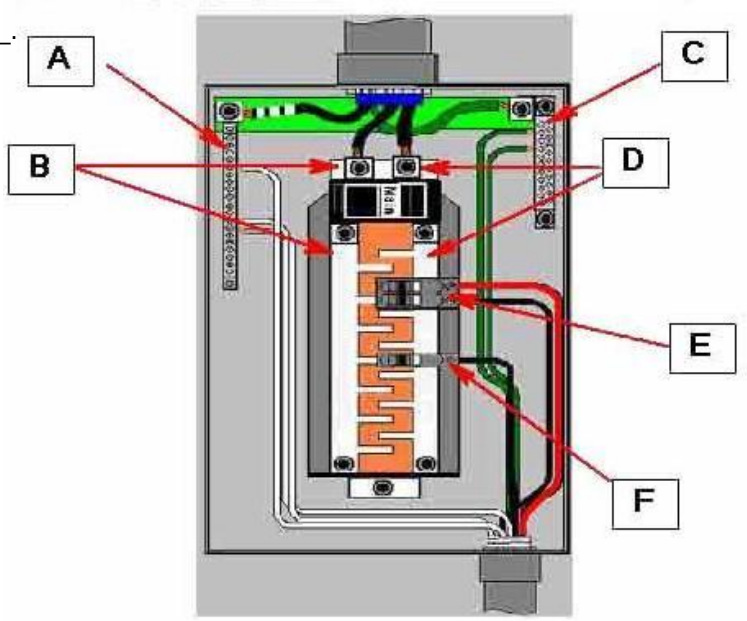
6. The L2 buss bar is labeled _____.
- A
- B
- C
- D
- E

7. The neutral buss bar is labeled _____.
- A
- B
- C
- D
- E

8. The 240v breaker is labeled _____.
- A
- B
- C
- D
- E

9. How many 120 volt legs enter a typical home's power panel?
- 1 leg
- 2 legs
- 3 legs

10. In a typical home's power panel, the ground buss and the neutral buss are connected.
- True
- False



11. It is good practice to remove the third or ground prong of a plug from an electric drill.
- True
- False

12. A 240-volt circuit breaker connects to a single 120-volt leg in typical homes in the power panel.
- True
- False

Quiz 5

1. Electrical potential is measured in _____.
- Ohms
- Volts
- Watts
- Amps
- none of the answers provided

2. In a water heater, cold water enters the tank at the _____.
- top
- middle
- bottom

3. In a water heater, the hot water is drawn from what section of the tank?
- top
- middle
- bottom

4. Using a volt meter, you will get a voltage reading when taking a measurement across an electrical power source.
- True
- False

5. Using a volt meter, you will get a voltage reading when taking a measurement across an electrical load.
- True
- False

6. When testing for resistance using a volt/Ohm meter while testing across an open switch (voltage disconnected), your reading will be O.L.
- True
- False

7. When testing a good closed switch, your reading will be O.L.
- True
- False

8. When testing resistance in a good heating element, you will get the following reading from your Volt/Ohm meter.
- O.L.
- Ohms
- Volts

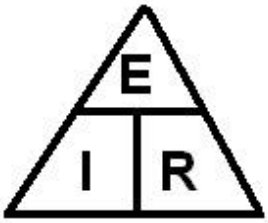
9. Water heaters with a rated circuit load in excess of 3,500 watts at 208 volts must use a wire no smaller than _____.
- 6 AWG
- 8 AWG
- 10 AWG
- 12 AWG
- 14 AWG

Quiz 6

1. In the formula for Ohms Law, what does the letter E stand for?
- Volts
- Ohms
- Amps

2. In the formula for Ohms Law, what does the letter I stand for?
- Volts
- Ohms
- Amps

3. In the formula for Ohms Law, what does the letter R stand for?
- Volts
- Ohms
- Amps



4. Using the above Ohms law formula, write the equation for finding Volts:
- E = I x R
- E = I / R
- E = R / I

5. Using the above Ohms law formula, write the equation for finding Current:
- I = E / R
- I = E x R
- I = R / E

6. Using the above Ohms law formula, write the equation for finding Resistance:
- R = E / I
- R = E x I
- R = I / E

7. E = 208 Volts, R = 121 Ohms, I = _____.
- 1.7 amps
- 0.58 amps
- 25.2 amps
- none of the answers provided

8. R = 10 Ohms, I = 48 Amps, V = _____.
- 2.08v
- 480v
- 208v
- 240v
- 120v

9. Voltage = 120 volts, Amps = 15, R = _____.
- 80 Ohms
- 8 Ohms
- 1800 Ohms
- none of the answers provided

Quiz 7

1. Proper grounding is important so that _____.
- during a seismic ground shift, the equipment is stationary
- the equipment is always level and plumb
- the equipment does not move from the set location
- none of the answers provided

2. A green wire fastened to metal parts of equipment means _____.
- the metal parts are electrically connected
- the metal parts are part of the fan circuits
- the equipment and parts are environmentally safe
- none of the answers provided

3. The earth can be used as the only method of grounding conductors or ground fault current path.
- True
- False

4. A ground connection to a water pipe must be made within _____ of the entrance of the pipe to the building.
- 1 foot
- 3 feet
- 5 feet
- 8 feet
- 10 feet

Quiz 8

1. A 12 AWG copper wire can generally be used to carry a maximum of _____.
- 10 amps
- 12 amps
- 16 amps
- 20 amps
- 30 amps

2. A 10 AWG copper wire can generally be used to carry a maximum of _____.
- 10 amps
- 12 amps
- 16 amps
- 20 amps
- 30 amps

3. By increasing the diameter of a wire, more electrons or increased amps, can flow without the buildup of excessive heat.
- True
- False

4. A standard plug fuse will fit in an S type fuse holder.
- True
- False

5. A standard plug fuse provides protection from high ampere levels and short-circuits.
- True
- False

6. The common rating of a circuit breaker is in _____.
- Volts
- Ohms
- arch corona rating
- Amps
- dielectric strength

7. This is an alternate term for Romex.
- RM
- NM
- MN
- None of the answers provided

8. When installing Romex, the minimum distance back from the face of the stud to the routing hole is _____.
- 1”
- 1-1/4”
- 1-1/2”
- 2”

9. When installing Romex on a wooden stud, no extra protection is needed if the cable is more than 1-1/4” from the face of the stud.
- True
- False

10. A protective nail plate should be at least _____ in thickness.
- 1/32 inches
- 1/16 inches
- 3/32 inches
- 1/8 inches

11. Romex must be supported within _____ of a box.
- 6 inches
- 8 inches
- 12 inches
- 16 inches

12. Romex must be supported at least every _____.
- 1 foot
- 3 feet
- 4-1/2 feet
- 6 feet
- 8 feet

13. When installing Romex in metal studs, it is not necessary to install protection for the cables in the holes.
- True
- False

14. Romex entering or exiting a power panel or junction box needs to be secured with cable clamps.
- True
- False

15. Romex may be installed in wet locations without conduit.
- True
- False

16. Romex is not UV sensitive and may be installed in situations exposed to sunlight.
- True
- False

Quiz 9

1. GFCI means _____.
- Ground Fault Circuit Interrupters
- Grounded Facility Circuit Interrupter
- Gross Fluctuation Capacitor Interaction
- None of the answers provided

2. The year that the National Electric Code mandated GFCI protection in houses was _____.
- 1993
- 1963
- 1973
- 2003

3. The purpose of a GFCI _____.
- conserves electricity by interrupting current flow
- automatically re-sets circuit when power is interrupted
- instantly interrupts current flow to prevent shock
- all of the answers provided

4. GFCI receptacles are required on all receptacles serving kitchen counter tops.
- True
- False

5. A GFCI receptacle is required for a dedicated circuit that only supplies power for a garbage disposal.
- True
- False

6. GFCI receptacles are required when installed in the garage.
- True
- False

7. If work is required on electrical equipment that has a fused disconnect box, what is the first step that should be done?
- Protect yourself and put the key to the lockout in your pocket.
- Turn the disconnect arm or lever to the off position.
- Check with a voltage pen to verify that power is off.
- Secure power to the electrical circuit by locking out the disconnect box.
- Remove the fuses from the disconnect box.

8. If work is required on electrical equipment that has a fused disconnect box, what is the second step that should be done?
- Protect yourself and put the key to the lockout in your pocket.
- Turn the disconnect arm or lever to the off position.
- Check with a voltage pen to verify that power is off.
- Secure power to the electrical circuit by locking out the disconnect box.
- Remove the fuses from the disconnect box.

9. If work is required on electrical equipment that has a fused disconnect box, what is the third step that should be done?
- Protect yourself and put the key to the lockout in your pocket.
- Turn the disconnect arm or lever to the off position.
- Check with a voltage pen to verify that power is off.
- Secure power to the electrical circuit by locking out the disconnect box.
- Remove the fuses from the disconnect box.

10. If work is required on electrical equipment that has a fused disconnect box, what is the fourth step that should be done?
- Protect yourself and put the key to the lockout in your pocket.
- Turn the disconnect arm or lever to the off position.
- Check with a voltage pen to verify that power is off.
- Secure power to the electrical circuit by locking out the disconnect box.
- Remove the fuses from the disconnect box.

11. If work is required on electrical equipment that has a fused disconnect box, what is the last step that should be done?
- Protect yourself by putting the key of your lock in your pocket.
- Turn the disconnect arm or lever to the off position.
- Check with a voltage pen to verify that power is off.
- Secure power to the electrical circuit by locking out the disconnect box.
- Remove the fuses from the disconnect box.

12. The 1st step in an electrical rescue is _____.
- to find the breaker or disconnect and turn the power off
- to find a dry non-conductive wooden or fiberglass handle or stick to remove the electrical wire from the victim
- to call 911 and then apply CPR if needed
- to cover with a blanket to help warm the victim if conscious or continue with CPR if unconscious

13. The 2nd step in an electrical rescue is _____.
- to find the breaker or disconnect and turn the power off
- to find a dry non-conductive wooden or fiberglass handle or stick to remove the electrical wire from the victim
- to call 911 and then apply CPR if needed
- to cover with a blanket to help warm the victim if conscious or continue with CPR if unconscious

14. The 3rd step in an electrical rescue is _____.
- to find the breaker or disconnect and turn the power off
- to find a dry non-conductive wooden or fiberglass handle or stick to remove the electrical wire from the victim
- to call 911 and then apply CPR if needed
- to cover with a blanket to help warm the victim if conscious or continue with CPR if unconscious

15. The 4th step in an electrical rescue is _____.
- to find the breaker or disconnect and turn the power off
- to find a dry non-conductive wooden or fiberglass handle or stick to remove the electrical wire from the victim
- to call 911 and then apply CPR if needed
- to cover with a blanket to help warm the victim if conscious or continue with CPR if unconscious

16. Metal ladders should be used while working with electricity.
- True
- False

17. Remove jewelry when working with electricity.
- True
- False