

TEST BANK

EIGHTH EDITION

PRINCIPLES OF ELECTRIC CIRCUITS ELECTRON FLOW VERSION



FLOYD



TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 1) The smallest particle of an element that still retains the characteristics of the element is called an atom. 1) _____
- 2) Electrons are negatively charged particles, and are contained in the nucleus of the atom. 2) _____
- 3) In the neutral state all atoms contain the same number of protons and electrons. 3) _____
- 4) The outermost shell of an atom is called the *valence* shell. 4) _____
- 5) The copper atom contains 29 free electrons. 5) _____
- 6) The nucleus contains protons and electrons, each with an opposite charge. 6) _____
- 7) The process of gaining a valence electron is known as ionization. 7) _____
- 8) Valence electrons are tightly bound in insulators. 8) _____
- 9) Current value depends on the amount of charge moving past a point in a unit of time. 9) _____
- 10) The movement of electrons between two points is called voltage. 10) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 11) The best conductor in the following list is: 11) _____
A) Silver B) Silicon
C) Copper D) Germanium
- 12) The materials with the fewest *free* electrons are classified as: 12) _____
A) silly putty B) insulators
C) conductors D) semiconductors
- 13) The unit of electrical charge is measured in: 13) _____
A) positive or negative charges B) amperes
C) Coulombs D) free electrons
- 14) How is a negative ion produced? 14) _____
A) the atom gains a proton in the nucleus
B) the atom gains an electron in the nucleus
C) the atom loses an electron from the valence shell
D) the atom gains an electron in the valence shell
- 15) A voltage source contains which of the following? 15) _____
A) electromotive force B) potential difference
C) potential energy D) all of the above
- 16) Which of the following is NOT a voltage source? 16) _____

- A) semiconductor B) solar cell
C) battery D) generator
- 17) The rate of flow of free electrons in a conductive material is called: 17) _____
A) current B) coulomb C) ampere D) voltage
- 18) Five coulombs of charge flow past a point in 0.5 seconds. How many amperes of current are flowing? 18) _____
A) 5 A B) 15 A C) 10 A D) 20 A
- 19) The opposition to current is called: 19) _____
A) resistance B) conductance
C) ohms D) insulators
- 20) The typical resistor to use for higher power applications would be the: 20) _____
A) carbon-composition
B) wire wound
C) metal oxide
D) metal film
E) carbon film
- 21) A resistor coded with Red-Violet-Black-Gold bands respectively, would be of what value and tolerance? 21) _____
A) $27 \Omega \pm 5\%$ B) $270 \Omega \pm 5\%$
C) $0.27 \Omega \pm 5\%$ D) $2.7 \Omega \pm 5\%$
- 22) A potentiometer is a: 22) _____
A) voltage-control device B) variable resistor
C) 3-terminal device D) all of the above
- 23) Which of the following is NOT needed to form an electric circuit? 23) _____
A) load B) voltage source
C) conductive path for current D) switch
- 24) To measure current with an ammeter, connect the ammeter: 24) _____
A) across the load B) across the voltage source
C) in the current path D) across the resistance
- 25) DMM's are the most widely used type of electronic measuring instrument because of: 25) _____
A) greater ease of reading
B) better accuracy
C) more functions provided
D) greater reliability
E) all of the above
- 26) Determine the tolerance and resistance of a resistor labeled 470KJ. 26) _____
A) $47 \Omega \pm 5\%$ B) $47 \text{ k}\Omega \pm 5\%$
C) $470 \text{ k}\Omega \pm 5\%$ D) $4700 \Omega \pm 5\%$
- 27) A rheostat is a: 27) _____
A) voltage-control device B) 3-terminal device


C) variable resistor

D) all of the above

- 28) What is the maximum resolution of a 3 1/2-digit DMM when measuring volts? 28) _____
A) 0.1 V B) 0.0001 V C) 0.01 V D) 0.001 V
- 29) The adjustable contact of a 1 k linear potentiometer is set at 3/4 of full rotation from the lower-end terminal. What is the resistance between the adjustable contact and the upper-end terminal? 29) _____
A) 1 k Ω B) 250 Ω C) 750 Ω D) 500 Ω
- 30) If you need a 5.1 Ω resistor with +/- 5% tolerance, what color code should you look for? 30) _____
A) BLU-BRN-BL-GOLD B) GRN-BRN-BLK-GOLD
C) GRN-BLK-GOLD-GOLD D) GRN-BRN-GOLD-GOLD
- 31) The negative and positive charge symbols are assigned (in that order) to the: 31) _____
A) atom and nucleus B) electron and element
C) proton and electron D) electron and proton
- 32) Valence electrons of an atom determine the: 32) _____
A) atomic number
B) electrical stability only
C) chemical and electrical stability
D) chemical stability only
- 33) What is the most commonly used conductor in electronics? 33) _____
A) gold B) copper
C) aluminum D) silver
- 34) A conductor has 3.12×10^{20} electrons pass through it. How much charge is this? 34) _____
A) 50 coulombs B) 20 coulombs
C) 3.12 coulombs D) 62.4 coulombs
- 35) The capacity of a battery cell is measured by the amount of _____ that can be supplied over time. 35) _____
A) joules B) voltage C) coulomb D) current
- 36) If a fluid system is compared to an electrical system, the fluid pump will correspond to a: 36) _____
A) battery B) conductor
C) generator D) both A and C
- 37) The force that causes conductor electrons to move is: 37) _____
A) voltage B) current
C) resistance D) conductance
- 38) Current equals: 38) _____
A) coulombs \times time B) $\frac{\text{voltage}}{\text{time}}$

$$C) \frac{\text{coulombs}}{\text{time}}$$

$$D) \text{voltage} \times \text{time}$$

- 39) Electrical current is defined as the movement of which subatomic particles? 39) _____
A) protons B) neutrons
C) molecules D) electrons
- 40) Siemens is a unit for: 40) _____
A) current B) resistance
C) voltage D) conductance
- 41) _____ would NOT increase the resistance of the wire. 41) _____
A) A smaller diameter wire B) Winding pattern
C) A lower AWG size wire D) Use in a hotter environment
- 42) Which statement is NOT true? 42) _____
A) A rheostat is a two terminal device.
B) A potentiometer can be used as a rheostat.
C) A rheostat can be used as a potentiometer.
D) A potentiometer is a three terminal device.
- 43) The fifth band in a precision resistor represents the: 43) _____
A) tolerance B) multiplier
C) reliability D) failure rate
- 44) A green fifth-band on a precision resistor indicates a tolerance value of \pm : 44) _____
A) 2% B) 0.25% C) 1% D) 0.5%
- 45) What is the tolerance of a resistor manufactured to a minimum value of 5445 ohms and a maximum value of 5555 ohms? 45) _____
A) 1% B) 2% C) 20% D) 10%
- 46) What is the resistance value and tolerance with color bands of gray, red, black, and gold? 46) _____
A) 820 ohms, \pm 10% B) 82 ohms, \pm 10%
C) 82 ohms, \pm 5% D) 820 ohms, \pm 5%
- 47)  47) _____
The switch shown is a:
A) DPDT B) DPST C) SPDT D) SPST
- 48) Ground is the reference point in electric circuits and has a potential of _____ with respect to other points in the circuit. 48) _____
A) source voltage B) 0 volts
C) an electron D) none of the above
- 49) In Bohr's model, the _____ level is called the ground state and represents the _____ atom with a single electron in the first shell. 49) _____
A) highest, most stable B) lowest, most stable
C) lowest, least stable D) lowest, least stable

- 50) Which is NOT one of the three categories of materials used in electronics? 50) _____
A) semiconductors B) insulators
C) conductors D) crystals
- 51) Which of the following is a true statement? 51) _____
A) Collisions do not cause electrons to lose some of their energy.
B) The property of a material to oppose current flow is called work.
C) The more collisions, the more restrictive the flow of electrons.
D) The more collisions, the more easier the flow of electrons.
- 52) Which of the following is a true statement? 52) _____
A) Voltage is not determined by charge.
B) Voltage is not determined by work.
C) Voltage is charge (Q) divided by energy (W).
D) Work is the product of voltage (V) and charge (Q).
- 53) Voltage can be produced by means of : 53) _____
A) light energy
B) chemical energy
C) magnetic energy combined with mechanical motion
D) all of the above
- 54) Which of the following is NOT a true statement? 54) _____
A) A lead-acid battery is a secondary (rechargeable) battery.
B) Flat, round batteries are often called button or coin batteries.
C) Batteries are usually classified according to their chemical makeup.
D) AAA batteries are physically larger than AA batteries.
- 55) Transistors used as switches 55) _____
A) Can be controlled by voltage
B) Are often called semiconductor switches.
C) Can open and close a circuit path.
D) all of the above
E) none of the above
- 56) Resistance of the human body averages between 56) _____
A) zero ohms and 100K ohms B) 10K ohms and 50K ohms
C) 90K ohms and 100K ohms D) 50K ohms and 100K ohms

- 1) TRUE
- 2) FALSE
- 3) TRUE
- 4) TRUE
- 5) FALSE
- 6) FALSE
- 7) FALSE
- 8) TRUE
- 9) TRUE
- 10) FALSE
- 11) A
- 12) B
- 13) C
- 14) D
- 15) D
- 16) A
- 17) A
- 18) C
- 19) A
- 20) B
- 21) A
- 22) D
- 23) D
- 24) C
- 25) E
- 26) C
- 27) C
- 28) D
- 29) B
- 30) D
- 31) D
- 32) C
- 33) B
- 34) A
- 35) D
- 36) D
- 37) A
- 38) C
- 39) D
- 40) D
- 41) C
- 42) C
- 43) A
- 44) D
- 45) A
- 46) C
- 47) C
- 48) B
- 49) B
- 50) D
- 51) C

- 52) D
- 53) D
- 54) D
- 55) D
- 56) B