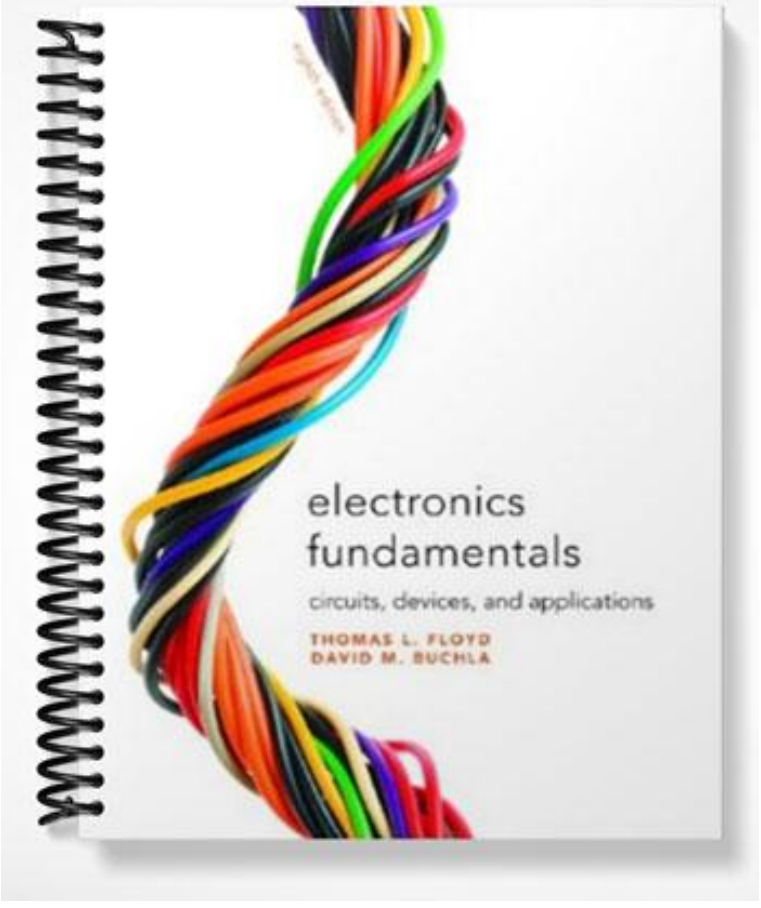
TEST BANK


electronics
fundamentals
circuits, devices, and applications
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TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

1) The movement of free electrons through a conductor is called *current*. 1) _____

2) Electrons attract each other. 2) _____

3) A resistor color coded with yellow, violet and orange bands has a value of 4.7 kΩ. 3) _____

4) A *SPST* switch is used to control one circuit. 4) _____

5) To measure the current through a resistor, place the ammeter so the current must pass through the meter. 5) _____

6) The *ohm* is the basic unit of resistance. 6) _____

7) A resistor color-coded with brown, black and orange bands has a value of 10,000 Ω. 7) _____

8) A *Normally Open Push Button* switch can carry current when not pushed. 8) _____

9) Electrons have a positive charge. 9) _____

10) *Resistance* is the opposition to the flow of current. 10) _____

11) An element with a relatively large amount of electrons in the valence ring is considered to be a good conductor. 11) _____

12) Electromotive force is measured in volts. 12) _____

13) The Nickel-Metal Hydride battery is an example of a secondary battery. 13) _____

14) A generator converts electrical energy into mechanical energy. 14) _____

15) For electrical current to flow in a circuit voltage must be applied to that circuit. 15) _____

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

16) A(n) _____ is a material that has many free electrons. 16) _____

A) insulator B) semiconductor
C) poor conductor D) conductor

17) An insulator is a material with _____. 17) _____

A) very few free electrons B) all free electrons
C) some free electrons D) very many free electrons

18) A resistor with orange, orange, red and gold bands has a value and tolerance of _____. 18) _____

A) 3.3 kΩ ±5% B) 33 kΩ ±5%
C) 33 kΩ ±10% D) 3.3 kΩ ±10%

19) If a resistor is color coded with red, red, orange and silver bands, the resistance equals _____, the lower tolerance limit equals _____, and the upper tolerance limit equals _____. 19) _____

A) 22 kΩ, 19.8 kΩ, 24.2 kΩ
B) 22 kΩ, 21.5 kΩ, 22.4 kΩ
C) 22 kΩ, 20.9 kΩ, 23.1 kΩ
D) 22 kΩ, 17.6 kΩ, 26.4 kΩ

20) The opposition to the flow of current is called _____. 20) _____

A) voltage
B) resistance
C) current
D) capacitance

21) If the current in a circuit equals 0 A, it is likely that the _____. 21) _____

A) resistance is too low
B) voltage is too high
C) circuit is open
D) circuit has a short

22) If the measured circuit current is zero, it is likely that the _____. 22) _____

A) circuit voltage is very high
B) voltage is turned off
C) circuit has a short
D) resistance is very low

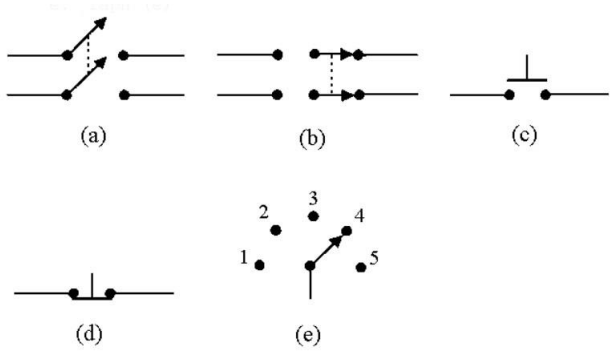

Figure 2-1

23) Identify the *Normally Open Push Button* switch in Figure 2-1. 23) _____

A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

24) Identify the *DPST* switch in Figure 2-1. 24) _____

A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

25) Identify the *Rotary* switch in Figure 2-1. 25) _____

A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

26) Which switch in Figure 2-1 could be used to simultaneously open or sim ultaneo

usly close two circuits? 26) ___ ___

A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

27) Identify the *Normally Closed Push Button* switch in Figure 2-1. 27) _____

A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

28) Which switch in Figure 2-1 is usually used to control a doorbell? 28) _____

A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

29) The *Rotary* switch in Figure 2-1 is most likely to be used as _____. 29) _____

A) a range selector switch in an analog voltmeter.
B) a selector for different voltages in a power supply.
C) an old manual TV channel selector.
D) all of the above

30) Identify the *DPDT* switch in Figure 2-1. 30) _____

A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

31) Which switch in Figure 2-1 would probably be used to control a light and a fan at the same time? 31) _____

A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

32) Which switch in Figure 2-1 could be used to switch two inputs to different output positions? 32) _____

A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

33) Which switch in Figure 2-1 could be used to open a circuit momentarily? 33) _____
A) graph (a)
B) graph (b)
C) graph (c)
D) graph (d)
E) graph (e)

34) What do you call a diagram that shows the electrical connections of a circuit's components? 34) _____
A) a schematic diagram B) a block diagram
C) an electrical diagram D) a pictorial diagram

35) To measure a circuit's source voltage, the voltmeter must _____. 35) _____
A) be placed in series in the circuit
B) have the red lead towards the negative side of the source
C) be placed across the source
D) have the black lead towards the positive side of the source

36) A source, a path, and a load _____. 36) _____
A) make up a basic circuit
B) do not make up a complete circuit
C) can only be an open circuit
D) will allow current to flow if the switch is open

37) Voltage is _____. 37) _____
A) the opposition to the flow of current
B) the force that causes water to flow
C) the movement of free electrons
D) the force that exists between charged particles

38) Which unit of charge contains 6.25×10^{18} electrons? 38) _____
A) an ampere B) a coulomb
C) a volt D) a joule

39) A conductor is a material that has _____. 39) _____
A) many free electrons
B) few free electrons
C) a positive charge
D) a structure similar to semiconductors

40) If a resistor equals 1.2 Ω ±5%, its color code is _____. 40) _____
A) brown, black, gold, silver B) brown, red, gold, gold
C) brown, black, red, gold D) brown, red, silver, gold

41) Every electrical circuit must contain _____. 41) _____
A) a battery, a resistor and a capacitor
B) a source, a load and a path
C) a source, a load and a resistor
D) a battery, a path and a switch

42) In order to measure the current in a circuit, an ammeter must _____. 42) _____
A) be placed across the source

B) be placed across the load
C) be placed so the current must pass through the meter
D) all of these

43) A resistor with yellow, violet, orange and silver bands equals _____. 43) _____
A) 4.7 kΩ ± 10% B) 47 kΩ ± 10%
C) 47 MΩ ± 10% D) 47 kΩ ± 5%

44) A resistor with yellow, violet, orange, and gold bands equals _____. 44) _____
A) 47 kΩ ± 5% B) 47 kΩ ± 10%
C) 47 MΩ ± 10% D) 4.7 kΩ ± 10%

45) If a resistor is color coded with orange, orange, orange and silver bands, the resistance equals _____, the lower tolerance limit equals _____ and the upper tolerance limit equals _____. 45) _____
A) 33 kΩ, 29,700 Ω, 36,300 Ω B) 33 kΩ, 32,670 Ω, 33,330 Ω
C) 33 kΩ, 26,400 Ω, 39,600 Ω D) 33 kΩ, 31,350 Ω, 34,650 Ω

46) A 100 kΩ ±10% resistor is color coded _____. 46) _____
A) brown, green, black, gold B) brown, black, yellow, gold
C) black, brown, yellow, silver D) brown, black, yellow, silver

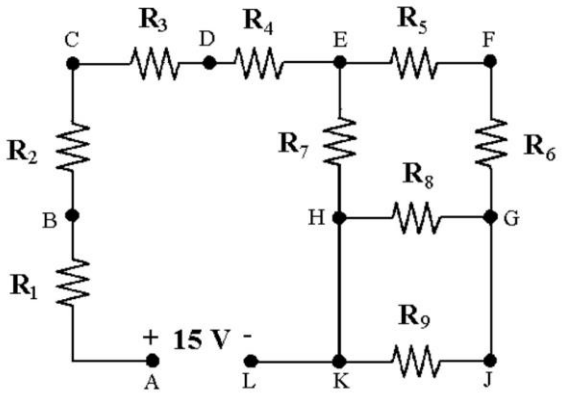

Figure 2-2

47) In Figure 2-2, if you place a voltmeter's red lead on point E and its black lead on point H, you will be measuring _____. 47) _____
A) V_{R5} B) V_{R6} C) V_{R7} D) V_{R4}

48) To measure the current that flows through R_6 in Figure 2-2, the circuit must be opened and the ammeter placed at point _____. 48) _____
A) G B) H C) E D) F

49) In Figure 2-2, the voltage V_{GH} is the same as _____. 49) _____
A) V_{R6} B) V_{R7} C) V_{R8} D) V_{R5}

50) In Figure 2-2, the voltage V_{FG} is the same as _____. 50) _____
A) V_{R6} B) V_{R9} C) V_{R8} D) V_{R7}

51) In Figure 2-2, a voltmeter placed across points C and D will measure _____. 51) _____

A) V_{R2} B) V_{R3} C) V_{R1} D) V_{R4}

52) In Figure 2-2, the voltage V_{CE} is the same as _____. 52) _____

A) $V_{R4} + V_{R5}$ B) V_{R6}

C) $V_{R3} + V_{R4}$ D) V_{R5}

53) An analog meter has _____. 53) _____

A) a needle and a scale to indicate the value

B) no moving parts

C) a high degree of accuracy

D) a digital readout

54) An ohmmeter should _____. 54) _____

A) be connected across a circuit with the power on

B) have the polarity carefully checked before its use

C) be placed across the resistor after the resistor has been disconnected from the circuit

D) be inserted into the circuit so the current flows through it

55) Most DMMs will measure _____ _____ and _____. 55) _____

A) frequency, voltage, current

B) voltage, current, capacitance

C) voltage, current, resistance

D) voltage, frequency, resistance

56) On a resistor with five bands of color code, the fifth band may represent that: 56) _____

A) the tolerance in percentage of value.

B) the reliability in percentage of failure.

C) the resistor is a precision resistor.

D) all of these.

57) On a resistor with four bands of color code, the fourth band represents: 57) _____

A) the multiplier value. B) the wattage rating.

C) the voltage rating. D) the tolerance percentage.

58) On a resistor with numbers and letters, the position of the letter in the sequence represents: 58) _____

A) the resistance value. B) the decimal point.

C) the numerical total. D) the tolerance.

59) Interpret the following mixed numbers and letters 4R7 on a resistor to the correct resistance of: 59) _____

A) 4.7 Kilohms. B) 4.7 ohms.

C) 4.7 Megohms. D) 47 ohms.

60) Interpret the following mixed numbers and letters 3M3 on a resistor to the correct resistance of: 60) _____

A) 33 Kilohms. B) 330 Kilohms.

C) 3.3 Kilohms. D) 3300 Kilohms.

61) Potentiometers and rheostats differ in that: 61) _____

A) potentiometers are used to vary voltages, while rheostats vary currents.
B) potentiometers utilize linear and nonlinear tapers, while rheostats usually utilize only linear tapers.
C) potentiometers utilize three terminals, while rheostats usually use only two terminals.
D) all of these.

62) A common type of resistors are: 62) _____
A) carbon film. B) wirewound.
C) carbon-composition. D) metal film.

63) In the American Wire Gauge sizes, as the numerical value of AWG goes higher, the cross sectional area of the wire: 63) _____
A) halves. B) doubles.
C) decreases. D) increases.

64) The basic difference between a fuse and a circuit breaker is that: 64) _____
A) a circuit breaker is reusable.
B) a fuse is reusable.
C) a circuit breaker is more reliable.
D) a fuse is faster.

65) Which type of resistor is used for high power applications? 65) _____
A) surface mount B) carbon composition
C) film D) wire wound

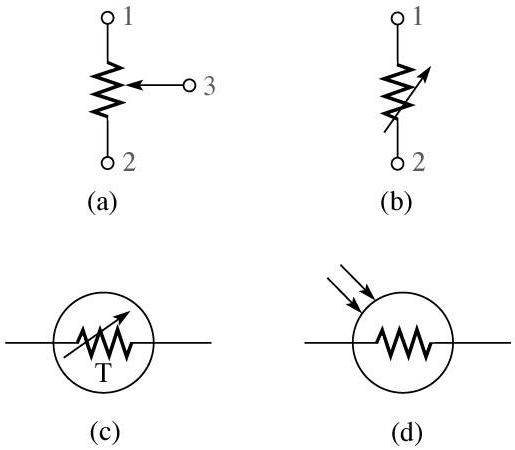

Figure 2-3

66) What does the schematic symbol (b) represent in Figure 2-3? 66) _____
A) photoconductive cell B) rheostat
C) thermistor D) potentiometer

67) Which of the following is not a type of variable resistor? 67) _____
A) photoconductive cell
B) potentiometer
C) thermistor
D) All are types of variable resistors.

68) The voltage measured directly across an open switch in a circuit will be: 68) _____

A) full applied voltage. B) 0 V.

C) half of applied voltage. D) unpredictable.

69) What is the key difference when taking voltage measurements with an analog meter versus a digital meter? 69) _____

A) adjustment of the scale

B) where the negative lead is placed

C) safety procedure in taking the measurement

D) proper choice of the scale on the display

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

52) C
53) A
54) C
55) C
56) A
57) D
58) B
59) B
60) D
61) D
62) C
63) C
64) A
65) D
66) B
67) D
68) A
69) D