

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

1) Electron flow is in the direction of conventional current

1) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question

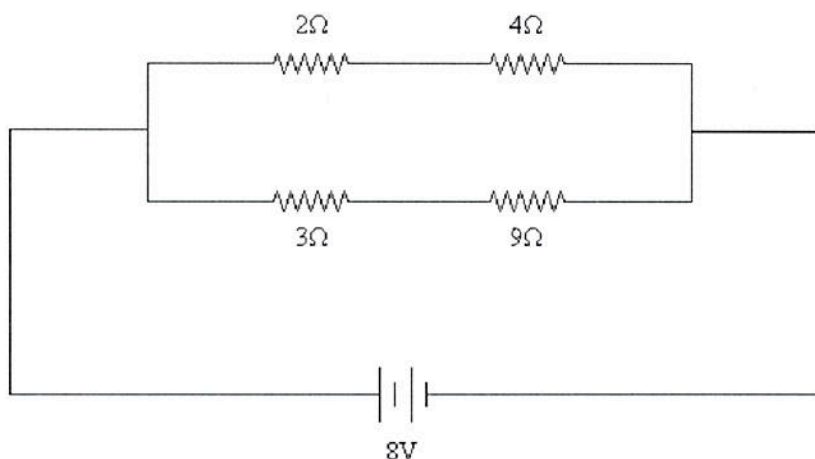
2) An electric device delivers a current of 5.0 A for 10 seconds. How many electrons flow through this device?

2) _____

3) A 200-W light bulb is connected across 110 V. What current will flow through this bulb?

3) _____

Figure 21-16



4) Four resistors of values 2Ω , 4Ω , 3Ω , and 9Ω are connected across an 8-V DC source as shown in Figure 21-16. What is the current through the 9Ω resistor?

4) _____

5) Three identical resistors are connected in series to a 12-V battery. What is the voltage across any one of the resistors?

5) _____

6) Three identical resistors are connected in parallel to a 12-V battery. What is the voltage of any one of the resistors?

6) _____

7) Which of the equations here is valid for the circuit shown?

7) _____

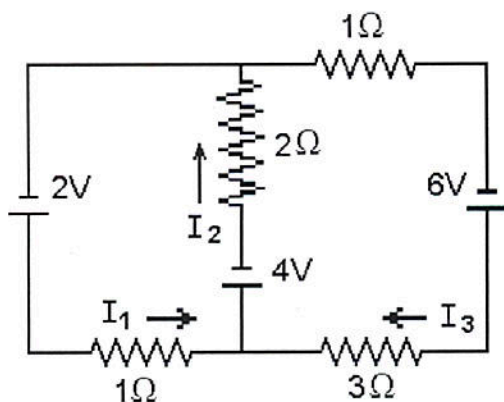


FIGURE 19-1

- 8) Four $20\text{-}\Omega$ resistors are connected in series. What is the equivalent resistance? 8) _____
- 9) Three resistors of 12 , 12 , and $6.0\text{ }\Omega$ are connected in parallel. A 12-V battery is connected to the combination. What is the current through the $6.0\text{-}\Omega$ resistor? 9) _____
- 10) A 14-A current flows into a series combination of a $3.0\text{-}\Omega$ and a $4.0\text{-}\Omega$ resistor. What is the voltage drop across the $4.0\text{-}\Omega$ resistor? 10) _____
- 11) A 14-A current flows into a series combination of a $3.0\text{-}\Omega$ and a $4.0\text{-}\Omega$ resistor. What is the voltage drop across the $3.0\text{-}\Omega$ resistor? 11) _____
- 12) A 22-A current flows into a parallel combination of $4.0\text{ }\Omega$, $6.0\text{ }\Omega$, and $12\text{ }\Omega$ resistors. What current flows through the $12\text{-}\Omega$ resistor? 12) _____
- 13) A 22-A current flows into a parallel combination of a $4.0\text{-}\Omega$, $6.0\text{-}\Omega$, and $12\text{-}\Omega$ resistors. What current flows through the $6.0\text{-}\Omega$ resistor? 13) _____
- 14) Two $4.0\text{-}\Omega$ resistors are connected in parallel, and this combination is connected in series with $3.0\text{ }\Omega$. What is the effective resistance of this combination? 14) _____

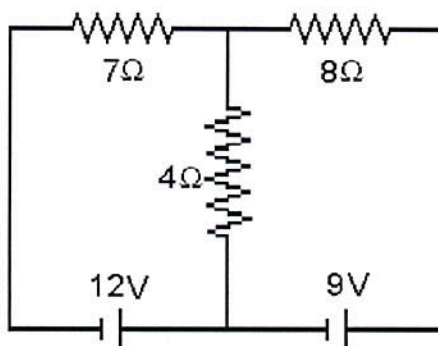
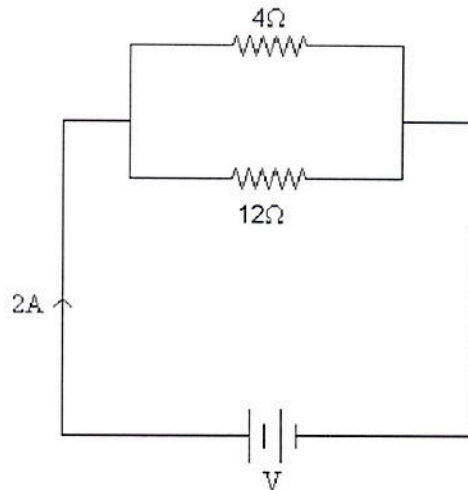


FIGURE 19-6

- 15) Determine the current in the $7\text{-}\Omega$ resistor in Fig. 19-6. 15) _____
- 16) Determine the current in the $8\text{-}\Omega$ resistor in Fig. 19-6. 16) _____
- 17) Determine the current in the $4\text{-}\Omega$ resistor in Fig. 19-6. 17) _____
- 18) A $2.0\text{-}\Omega$ resistor is in series with a parallel combination of $4.0\text{ }\Omega$, $6.0\text{ }\Omega$, and $12\text{ }\Omega$. What is the equivalent resistance of this combination? 18) _____
- 19) Two resistors of 15 and $30\text{ }\Omega$ are connected in parallel. If the combination is connected in series with a 9.0-V battery and a $20\text{-}\Omega$ resistor, what is the current through the $15\text{-}\Omega$ resistor? 19) _____

- 20) Three resistors of 4.0, 6.0, and 10.0 Ω are connected in parallel. If the combination is connected in series with a 12.0-V battery and a 2.0- Ω resistor, what is the current through the 10.0- Ω resistor? 20) _____
- 21) A 22-A current flows into a parallel combination of a 4.0- Ω , 6.0- Ω , and 12- Ω resistor. What current flows through the 4.0- Ω resistor? 21) _____
- 22) A 6.0- Ω and a 12- Ω resistor are connected in parallel to a 36-V battery. What power is dissipated by the 6.0- Ω resistor? 22) _____
- 23) A 100-W light bulb is connected to a 110-V source. What current flows through the lamp? 23) _____
- 24) A 100-W light bulb is connected to a 110-V source. What is the resistance of this bulb? 24) _____
- 25) The power rating of a resistor is 0.800 W. If the value of the resistor is 400 Ω , what is the maximum voltage? 25) _____
- 26) The power rating of a resistor is 0.80 W. If the value of the resistor is 400 Ω , what is the maximum current it can draw? 26) _____
- 27) A light bulb operating at a voltage of 120 Volt has a power of 60 W. What is the current flowing through this bulb? 27) _____
- 28) A light bulb operating at a voltage of 120 V has a resistance of 200 Ω . What is the power? 28) _____
- 29) The power rating of a 400 Ω resistor is 0.25 W. What is the maximum voltage? 29) _____
- 30) A simple circuit has a total resistance of 30 Ω . If a 2.0-A current is maintained in this circuit, how much energy is dissipated in this circuit in 4.0 seconds? 30) _____
- 31) A 100-V DC signal is applied to a series circuit composed of four equal resistors 10 Ω each. What is the voltage across each resistor? 31) _____
- 32) Four resistors of 20 Ω , 40 Ω , 60 Ω , and 80 Ω are connected across a DC voltage source. If the current through this circuit is 0.5 A, what is the voltage applied to this circuit? 32) _____
- 33) Four resistors of 20 Ω , 40 Ω , 60 Ω , and 80 Ω are connected across a 50-V DC source. What is the current through this circuit? 33) _____

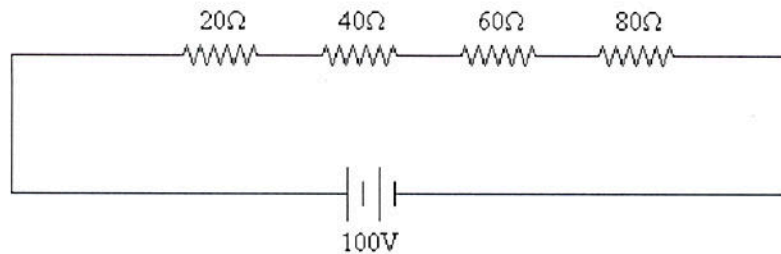
Figure 21-3



- 34) A $4\text{-}\Omega$ resistor is connected in parallel with a $12\text{-}\Omega$ resistor and this combination is connected to a DC power supply with voltage V as shown in Figure 21-3. If the total current in this circuit is 2 A , what is the value of voltage V ?

34) _____

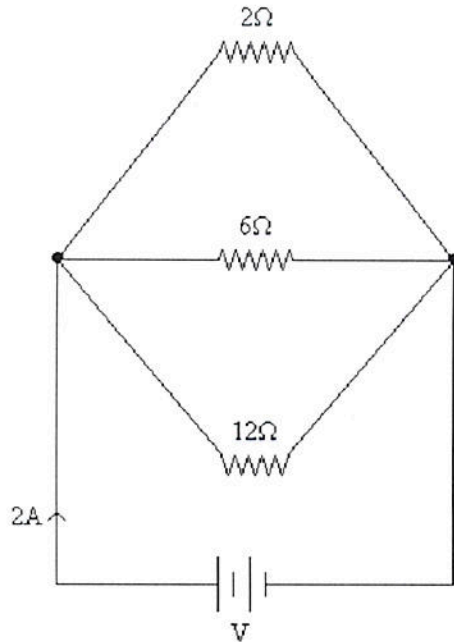
Figure 21-4



- 35) A 100 V DC signal is applied to four resistors as shown in Figure 21-4. The values of the resistors are $20\text{ }\Omega$, $40\text{ }\Omega$, $60\text{ }\Omega$, and $80\text{ }\Omega$. What is the voltage across the $40\text{ }\Omega$ resistor?

35) _____

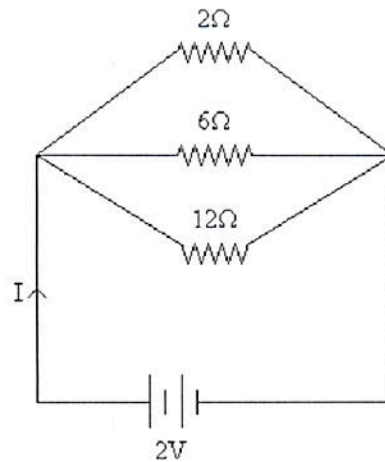
Figure 21-5



- 36) Three resistors of values 2Ω , 6Ω and 12Ω are connected across a DC voltage source as shown in Figure 21-5. If the total current through the circuit is 2.0 A , what is the applied voltage?

36) _____

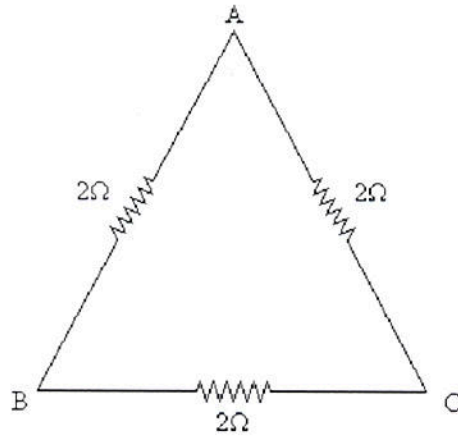
Figure 21-6



- 37) Three resistors of values 2Ω , 6Ω and 12Ω are connected across a 2.0-V DC voltage source as shown in Figure 21-6. What is the total current I flowing this circuit?

37) _____

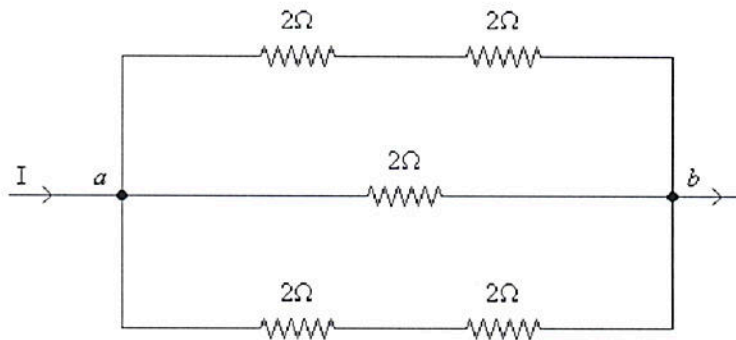
Figure 21-7



- 38) Three $2.0\text{-}\Omega$ resistors are connected across the sides of an equilateral triangle ABC as shown in Figure 21-7. What is the equivalent resistance between any two points, AB, BC, or AC, of this circuit?

38) _____

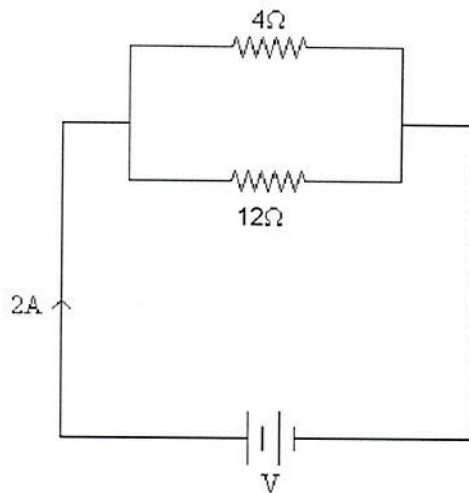
Figure 21-8



- 39) Five equal resistors, of value 2.0Ω each, are connected as shown in Figure 21-8. What is the equivalent resistance of this circuit?

39) _____

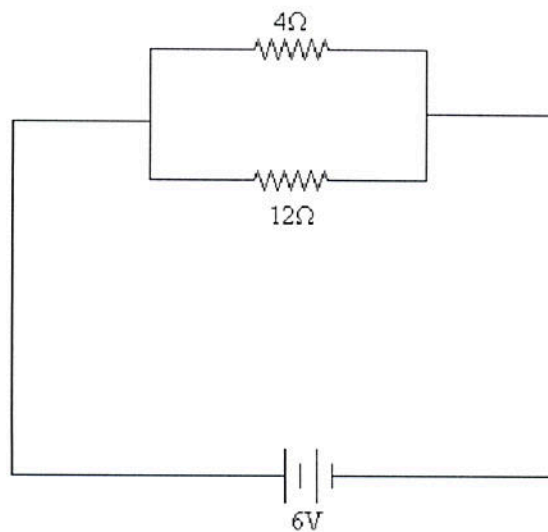
Figure 21-9



- 40) A $4.0\text{-}\Omega$ resistor is connected in parallel with a $12\text{-}\Omega$ resistor and both of these are connected to a DC power supply with voltage V as shown in Figure 21-9. If the total current in this circuit is 2.0 A , what is the current through the $4.0\text{-}\Omega$ resistor?

40) _____

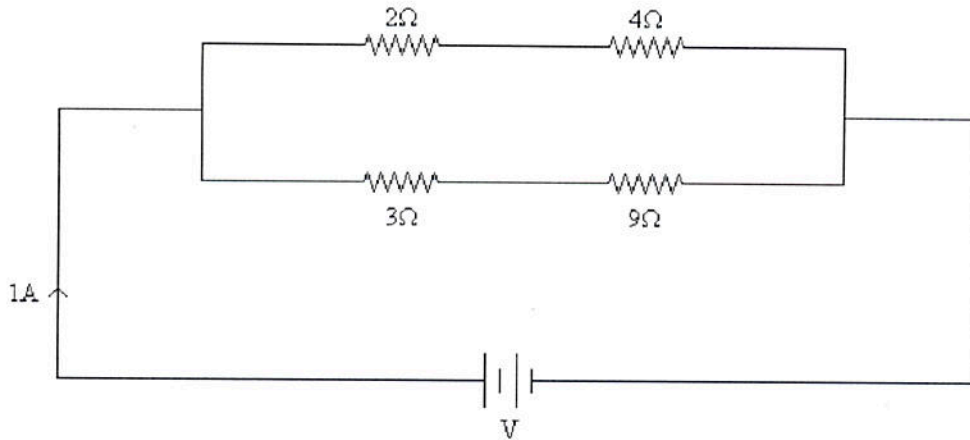
Figure 21-10



- 41) A $4\text{-}\Omega$ resistor is connected in parallel with a $12\text{-}\Omega$ resistor and this combination is connected to a 6-V DC power supply as shown in Figure 21-10. What is the current through the $12\text{-}\Omega$ resistor?

41) _____

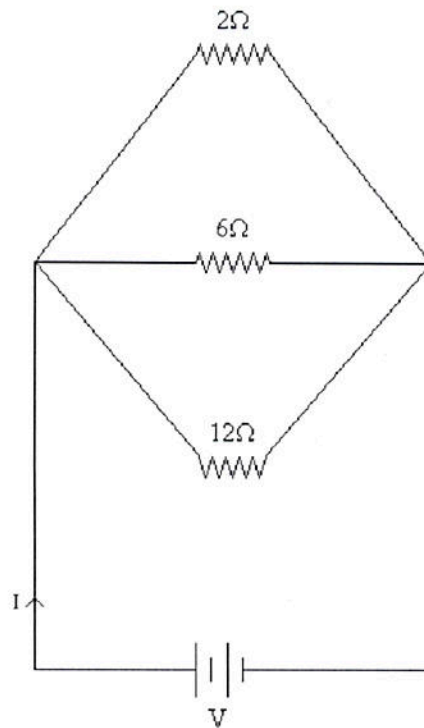
Figure 21-11



- 42) Four resistors of values $2\ \Omega$, $4\ \Omega$, $3\ \Omega$, and $9\ \Omega$ are connected across a DC source with voltage V as shown in Figure 21-11. If the total current through this circuit is $1\ \text{A}$, what is the value of the voltage V ?

42) _____

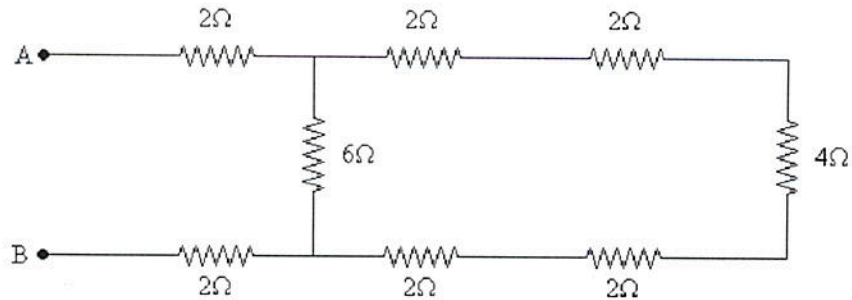
Figure 21-12



- 43) Three resistors of values $2\ \Omega$, $6\ \Omega$ and $12\ \Omega$ are connected across a DC voltage source as shown in Figure 21-12. If the total current through the circuit is $I = 5.0\ \text{A}$, what is the current through the $12\ \Omega$ resistor?

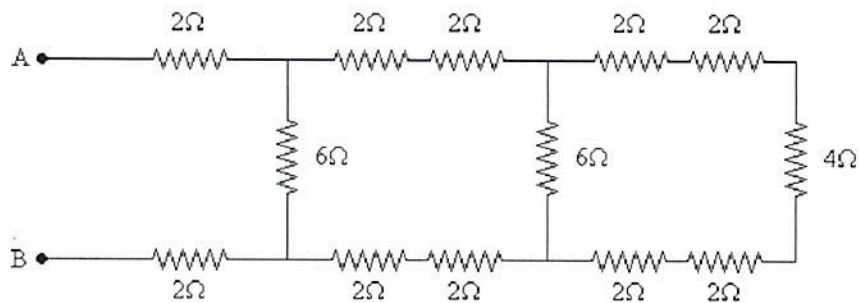
43) _____

Figure 21-13



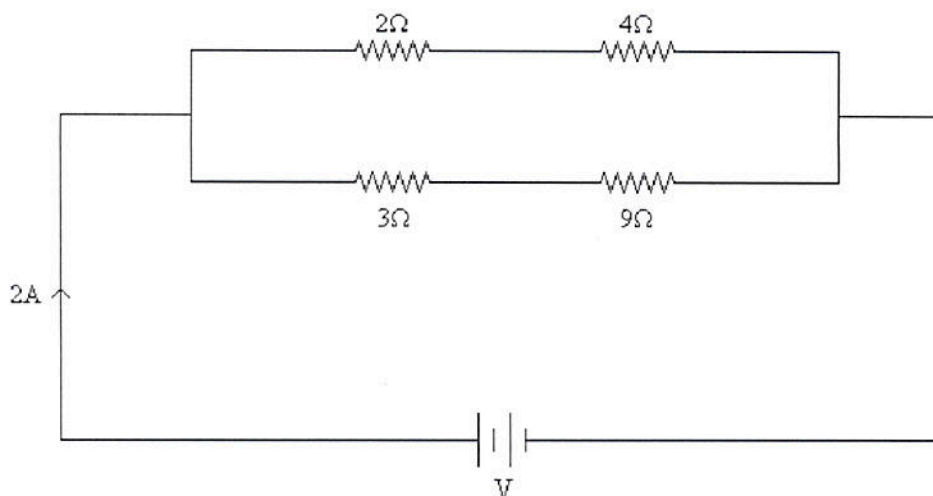
- 44) A number of resistors are connected across points A and B as shown in Figure 21-13. What is the equivalent resistance between points A and B? 44) _____

Figure 21-14



- 45) A number of resistors are connected across points A and B as shown in Figure 21-14. What is the equivalent resistance between points A and B? 45) _____

Figure 21-15



- 46) Four resistors of values 2.0Ω , 4.0Ω , 3.0Ω , and 9.0Ω are connected across a DC source with voltage V as shown in Figure 21-15. If the total current through this circuit is $2.0A$, what is the current through the 4Ω resistor? 46) _____

- 47) The potential difference between the ends of a resistor is 9 V when a current of 1 A flows through it. What is the value of that resistor? 47) _____
- 48) The resistance of a 100-cm wire of cross sectional area $2 \times 10^{-6} \text{ m}^2$ is 400Ω . What is the resistivity of the material of this wire? 48) _____
- 49) The resistivity of the material of a wire is $1.76 \times 10^{-8} \Omega\text{m}$. If the diameter of the wire is $2 \times 10^{-3} \text{ m}$ and its length is 2 m, what is its resistance? 49) _____
- 50) The resistivity of a 1.0 m long wire is $1.72 \times 10^{-8} \Omega\text{m}$ and its cross sectional area is $2.0 \times 10^{-6} \text{ m}^2$. If the wire carries a current of 0.20 A, what is the voltage across the wire? 50) _____

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

- 51) The resistivity of the material of a wire is inversely proportional to the resistance of the wire 51) _____
- 52) Four unequal resistors connected in series have same current but different voltages 52) _____
- 53) Four equal resistors connected in series have same current and same voltage across each resistor 53) _____
- 54) Four equal resistors connected across a DC voltage source in either series or parallel will have equal voltage drops across each resistor. 54) _____
- 55) Kirchhoff's voltage rule is an example of conservation of energy. 55) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question

- 56) A wire of resistivity ρ must be replaced in a circuit by a wire four times as long. If, however, the total resistance is to remain as before, the diameter of the new wire must 56) _____
- 57) The length of a certain wire is kept same while its radius is doubled. What is the change in the resistance of this wire? 57) _____
- 58) The length of a certain wire is doubled while its radius is kept constant. What is the change in the resistance of this wire? 58) _____
- 59) The length of a certain wire is doubled and at the same time its radius is also doubled. What is the change in the resistance of this wire? 59) _____
- 60) The length of a certain wire is doubled and at the same time its radius is reduced by a factor of 2. What is the change in the resistance of this wire? 60) _____
- 61) The length of a certain wire is doubled and at the same time its radius is increased by a factor of 4. What is the change in the resistance of this wire? 61) _____
- 62) When the current through a resistor is increased by a factor of 4, the power dissipated by it 62) _____

Answer Key

Testname: UNTITLED1

- 1) FALSE
- 2) 3.1×10^{20}
- 3) 1.8 A
- 4) 0.7 A
- 5) 4 V
- 6) 12 V
- 7) $-2 - I_1 - 2I_2 = 0$
- 8) 80Ω
- 9) 2.0 A
- 10) 56 V
- 11) 42 V
- 12) 3.7 A
- 13) 7.3 A
- 14) 5.0Ω
- 15) 1.6 A
- 16) 1.3 A
- 17) 0.28 A
- 18) 4.0Ω
- 19) 0.20 A
- 20) 0.59 A
- 21) 11 A
- 22) 220 W
- 23) 0.91 A
- 24) 121Ω
- 25) 17.9 V
- 26) 45 mA
- 27) 0.5 A
- 28) 72 W
- 29) 10 V
- 30) 480 J
- 31) 25 V
- 32) 100 V
- 33) 0.25 A
- 34) 6 V
- 35) 20 V
- 36) 2.7 V
- 37) 1.5 A
- 38) 1.3Ω
- 39) 1.0Ω
- 40) 1.5 A
- 41) 0.5 A
- 42) 4 V
- 43) 0.6 A
- 44) 8Ω
- 45) 8Ω
- 46) 1.3 A
- 47) 9Ω
- 48) $8 \times 10^{-4} \Omega\text{m}$
- 49) 0.0112Ω

Answer Key

Testname: UNTITLED1

- 50) 1.7 mV
- 51) FALSE
- 52) TRUE
- 53) TRUE
- 54) TRUE
- 55) TRUE
- 56) be two times larger.
- 57) It is reduced by a factor of 4.
- 58) It is doubled.
- 59) It is reduced by a factor of 2.
- 60) It increases by a factor of 8.
- 61) It is reduced by a factor of 8.
- 62) increases by a factor of 16.