Current Electricity Questions for NEET/EAMCET

1. What is the equivalent resistance between points A and B in a circuit where three resistors of 6 Ω each are connected in parallel?

   a) 2 Ω

   b) 6 Ω

   c) 18 Ω

   d) 3 Ω

2. A wire of resistance 10 Ω is stretched to double its original length. What will be its new resistance?

   a) 20 Ω

   b) 40 Ω

   c) 5 Ω

   d) 10 Ω

3. In a circuit, a 12 V battery is connected across a resistor. If the current flowing is 2 A, what is the power dissipated in the resistor?

   a) 24 W

   b) 12 W

   c) 6 W

   d) 48 W

4. The drift velocity of electrons in a conductor is of the order of:

   a) 10^{-3} m/s

   b) 10^{8} m/s

   c) 10^{5} m/s

   d) 10^{-10} m/s

5. A cell of emf 2 V and internal resistance 1 Ω is connected to an external resistor of 4 Ω. What is the terminal voltage of the cell?

   a) 1.6 V

   b) 2 V

   c) 1.8 V

   d) 1.2 V

6. What is the resistance of a copper wire of length 2 m and cross-sectional area 2×10^{-6} m^2? (Resistivity of copper = 1.7×10^{-8} Ω·m)

   a) 0.017 Ω

   b) 0.034 Ω

   c) 0.0085 Ω

   d) 0.068 Ω

7. In a Wheatstone bridge, the condition for balance is achieved when the ratio of resistances in one arm is 3:2. What is the ratio of resistances in the other arm?

   a) 2:3

   b) 3:2

   c) 1:1

   d) 4:3

8. A potentiometer wire of length 10 m has a resistance of 20 Ω. If a battery of 2.5 V is connected across it, what is the potential gradient along the wire?

   a) 0.25 V/m

   b) 0.5 V/m

   c) 0.025 V/m

   d) 0.125 V/m

9. The specific resistance of a material depends on:

   a) Length of the conductor

   b) Cross-sectional area

   c) Nature of the material

   d) Current flowing through it

10. Two resistors of 4 Ω and 6 Ω are connected in parallel across a 12 V battery. What is the current through the 4 Ω resistor?

    a) 3 A
    b) 2 A
    c) 1.5 A
    d) 4 A

11. A 100 W bulb is designed to operate at 220 V. What is the resistance of the bulb?

    a) 484 Ω
    b) 220 Ω
    c) 100 Ω
    d) 44 Ω

12. The temperature coefficient of resistance of a conductor is 0.004/°C. If its resistance is 50 Ω at 20°C, what will be its resistance at 70°C?

    a) 60 Ω
    b) 55 Ω
    c) 52 Ω
    d) 58 Ω

13. In a circuit containing two cells in series, one cell has an emf of 1.5 V and internal resistance of 0.5 Ω, and the other has an emf of 2 V and internal resistance of 1 Ω. What is the total emf?

    a) 3.5 V
    b) 2.5 V
    c) 1.5 V
    d) 4 V

14. The equivalent resistance of two resistors connected in series is 15 Ω, and their equivalent resistance in parallel is 3.6 Ω. What are the values of the two resistors?

    a) 10 Ω and 5 Ω
    b) 12 Ω and 3 Ω
    c) 9 Ω and 6 Ω
    d) 8 Ω and 7 Ω

15. A galvanometer of resistance 50 Ω gives a full-scale deflection for a current of 1 mA. What resistance should be added in series to convert it into a voltmeter of range 10 V?

    a) 9950 Ω
    b) 9500 Ω
    c) 10000 Ω
    d) 5000 Ω

16. Kirchhoff's first law is based on the conservation of:

    a) Energy
    b) Charge
    c) Momentum
    d) Power

17. A 5 Ω resistor and a 10 Ω resistor are connected in series with a 15 V battery. What is the potential difference across the 10 Ω resistor?

    a) 5 V
    b) 10 V
    c) 15 V
    d) 7.5 V

18. The resistance of a wire increases by 10% when its temperature increases by 20°C. What is the temperature coefficient of resistance of the wire?

    a) 0.005/°C
    b) 0.0025/°C
    c) 0.01/°C
    d) 0.025/°C

19. In a circuit, a battery of 10 V and internal resistance 2 Ω is connected to a 3 Ω resistor. What is the current in the circuit?

    a) 2 A
    b) 1 A
    c) 3 A
    d) 4 A

20. A wire of resistance 5 Ω is connected to a battery of 6 V. If a second identical wire is connected in parallel with the first, what is the total power dissipated?

a) 7.2 W

b) 14.4 W

c) 3.6 W

d) 9.6 W

21. Which of the following statements is true about the resistivity of a conductor?

a) It decreases with an increase in temperature

b) It is independent of the material's dimensions

c) It is inversely proportional to the conductor's length

d) It remains constant with changes in temperature

22. A battery of emf 12 V and negligible internal resistance is connected to two resistors of 3 Ω and 6 Ω in series. What is the heat generated per second in the 6 Ω resistor?

a) 8 W

b) 4 W

c) 16 W

d) 2 W

23. In a potentiometer experiment, the balancing length for a cell of emf 1.5 V is 60 cm. If the length of the potentiometer wire is 100 cm, what is the emf of the battery connected across the wire?

a) 2 V

b) 2.5 V

c) 1.8 V

d) 3 V

24. The mobility of electrons in a conductor is defined as:

a) Drift velocity per unit electric field

b) Current per unit area

c) Resistance per unit length

d) Charge per unit potential difference

25. Four identical resistors of 8 Ω each are arranged to form a square. What is the equivalent resistance between two diagonally opposite corners?

a) 8 Ω

b) 4 Ω

c) 16 Ω

d) 2 Ω

26. A galvanometer has a resistance of 20 Ω and gives a full-scale deflection for 5 mA. What shunt resistance is required to convert it into an ammeter of range 5 A?

a) 0.02 Ω

b) 0.04 Ω

c) 0.01 Ω

d) 0.08 Ω

27. The current in a wire varies with time according to the relation $I = 3t + 2$ (where I is in amperes and t is in seconds). How much charge flows through the wire between $t = 0$ and $t = 2$ s?

a) 10 C

b) 8 C

c) 12 C

d) 6 C

28. Two wires A and B of the same material have lengths in the ratio 1:2 and diameters in the ratio 2:1. What is the ratio of their resistances ($R_A : R_B$)?

a) 1:8

b) 1:2

c) 2:1

d) 8:1

29. In a circuit with a 10 V battery and three resistors of 2 Ω each connected in parallel, what is the total current supplied by the battery?

a) 15 A

b) 5 A

c) 10 A

d) 7.5 A

30. Kirchhoff's second law is a consequence of the conservation of:

a) Charge

b) Energy

c) Momentum

d) Mass

31. A copper wire and an aluminum wire of the same length and cross-sectional area are connected in series. If the resistivity of copper is 1.7×10^{-8} Ω·m and that of aluminum is 2.8×10^{-8} Ω·m, what is the ratio of the voltage drops across them ($V_{Cu} : V_{Al}$)?

a) 17:28

b) 28:17

c) 1:1

d) 2:3

32. A cell of emf 2 V and internal resistance 0.5 Ω is short-circuited. What is the current through the cell?

a) 4 A

b) 2 A

c) 1 A

d) 0.5 A

33. The power dissipated in a resistor is 100 W when connected to a 20 V source. If the same resistor is connected to a 40 V source, what will be the new power dissipated?

a) 200 W

b) 400 W

c) 100 W

d) 300 W

34. In a meter bridge experiment, the null point is obtained at 40 cm from one end of the wire when a 10 Ω resistor is placed in one gap. What is the resistance in the other gap?

a) 15 Ω

b) 20 Ω

c) 10 Ω

d) 5 Ω

35. A battery of 6 V and internal resistance 1 Ω is connected to a variable resistor. What should be the value of the external resistance to achieve maximum power transfer?

a) 1 Ω

b) 2 Ω

c) 3 Ω

d) 6 Ω

36. The relaxation time of electrons in a conductor is typically of the order of:

a) 10^{-14} s

b) 10^{-6} s

c) 10^{-10} s

d) 10^{-2} s

37. Three resistors of 2 Ω, 3 Ω, and 6 Ω are connected in parallel. If the total current through the combination is 11 A, what is the current through the 3 Ω resistor?

a) 4 A

b) 6 A

c) 2 A

d) 3 A

38. A wire has a resistance of 12 Ω. If it is bent into a circle and the ends are connected, what is the resistance between two diametrically opposite points?

a) 3 Ω

b) 6 Ω

c) 12 Ω

d) 4 Ω

39. A steady current flows in a metallic conductor of non-uniform cross-section. Which quantity remains constant along the conductor?

a) Current density

b) Electric field

c) Drift velocity

d) Current

40. A 220 V, 1000 W electric heater is connected to a 110 V supply. What will be the power consumed?

a) 250 W

b) 500 W

c) 1000 W

d) 125 W

41. Which of the following factors does NOT affect the resistance of a conductor?

    a) Length of the conductor

    b) Temperature of the conductor

    c) Charge flowing through the conductor

    d) Cross-sectional area of the conductor

42. A 10 Ω resistor is connected to a battery of emf 15 V and internal resistance 5 Ω. What is the rate of energy loss due to internal resistance?

    a) 5 W

    b) 2.5 W

    c) 7.5 W

    d) 10 W

43. In a potentiometer circuit, the emf of the driver cell is 3 V, and the wire length is 150 cm. If the balancing length for an unknown cell is 90 cm, what is the emf of the unknown cell?

    a) 1.8 V

    b) 2 V

    c) 2.5 V

    d) 1.5 V

44. The current density in a wire is 5×10^5 A/m^2, and the wire has a cross-sectional area of 2×10^{-6} m^2. What is the current flowing through the wire?

    a) 1 A

    b) 0.5 A

    c) 2 A

    d) 0.1 A

45. Three resistors of 4 Ω each are connected in a delta configuration. What is the equivalent resistance between any two terminals?

    a) 4 Ω

    b) 2.67 Ω

    c) 6 Ω

    d) 12 Ω

46. A galvanometer with a resistance of 100 Ω and a full-scale deflection current of 2 mA is to be converted into an ammeter of range 10 A. What is the value of the shunt resistance required?

    a) 0.02 Ω

    b) 0.01 Ω

    c) 0.05 Ω

    d) 0.04 Ω

47. The potential difference across a resistor varies with time as $V = 4t$ (in volts, t in seconds). If the resistance is 2 Ω, what is the total heat produced in 5 seconds?

    a) 200 J

    b) 100 J

    c) 400 J

    d) 50 J

48. A wire of length 1 m and resistance 5 Ω is connected in series with another wire of the same material but with double the length and half the diameter. What is the total resistance of the combination?

    a) 45 Ω

    b) 25 Ω

    c) 15 Ω

    d) 35 Ω

49. In a circuit, three identical resistors are connected in parallel to a 9 V battery. If the power dissipated by the combination is 27 W, what is the resistance of each resistor?

    a) 3 Ω

    b) 9 Ω

    c) 1 Ω

    d) 6 Ω

50. In a balanced Wheatstone bridge, the resistances in the ratio 2:3 are in one arm. If the resistance in the galvanometer arm is infinite, what must be the ratio of resistances in the other arm?

    a) 3:2

    b) 2:3

    c) 1:1

    d) 4:5

51. A wire carries a current of 2 A when connected to a 10 V battery. If the same wire is connected to a 20 V battery, what will be the new current, assuming resistance remains constant?

    a) 4 A

    b) 2 A

    c) 1 A

    d) 8 A

52. A cell of emf 4 V and internal resistance 2 Ω is connected to a resistor R. If the maximum power delivered to R is 2 W, what is the value of R?

    a) 2 Ω

    b) 4 Ω

    c) 1 Ω

    d) 3 Ω

53. The resistance of a wire is 10 Ω at 20°C. If its temperature coefficient of resistance is 0.003/°C, at what temperature will its resistance become 13 Ω?

    a) 120°C

    b) 100°C

    c) 80°C

    d) 70°C

54. In a meter bridge, the null point shifts from 50 cm to 60 cm when a 5 Ω resistor is connected in parallel with the unknown resistance. What is the value of the unknown resistance?

    a) 10 Ω

    b) 15 Ω

    c) 20 Ω

    d) 12 Ω

55. The drift velocity of electrons in a conductor is doubled. What happens to the resistance of the conductor, assuming all other factors remain constant?

    a) Doubles

    b) Halves

    c) Remains unchanged

    d) Quadruples

56. A 12 V battery with an internal resistance of 1 Ω is connected to a load resistor. If the current in the circuit is 2 A, what is the power delivered to the load?

    a) 20 W

    b) 16 W

    c) 24 W

    d) 12 W

57. A conductor has a non-uniform cross-section, and its resistance per unit length increases linearly from 2 Ω/m at one end to 4 Ω/m at the other end over a length of 1 m. What is the total resistance of the conductor?

    a) 3 Ω

    b) 2 Ω

    c) 4 Ω

    d) 6 Ω

58. The emf of a cell is measured using a potentiometer. If the potential gradient of the wire is 0.02 V/cm and the balancing length is 75 cm, what is the emf of the cell?

    a) 1.5 V

    b) 2 V

    c) 1.2 V

    d) 1.8 V

59. Two bulbs rated 60 W, 220 V and 40 W, 220 V are connected in series across a 440 V supply. What will happen?

    a) Both bulbs will glow normally

    b) The 60 W bulb will burn out

    c) The 40 W bulb will burn out

    d) Both bulbs will burn out

60. A graph of current (I) versus voltage (V) for a resistor is a straight line passing through the origin with a slope of 0.2 A/V. What is the resistance of the resistor?

    a) 5 Ω

    b) 2 Ω

    c) 10 Ω

    d) 0.2 Ω

61. A circuit has three resistors: 2 Ω, 3 Ω, and 6 Ω in series with a 12 V battery. What is the voltage drop across the 3 Ω resistor?

a) 3 V

b) 4 V

c) 6 V

d) 2 V

62. Using Kirchhoff's laws, find the current through the 4 Ω resistor in a circuit where a 10 V battery is connected to a 4 Ω resistor in series with a parallel combination of 6 Ω and 3 Ω resistors.

a) 1 A

b) 1.5 A

c) 2 A

d) 0.5 A

63. The resistivity of a material is 4×10^{-7} Ω·m at 20°C. If its temperature coefficient of resistivity is 0.004/°C, what is its resistivity at 60°C?

a) 4.64×10^{-7} Ω·m

b) 4.32×10^{-7} Ω·m

c) 4.8×10^{-7} Ω·m

d) 5×10^{-7} Ω·m

64. Three resistors of 12 Ω each are connected in a star configuration. What is the equivalent resistance between any two terminals?

a) 8 Ω

b) 4 Ω

c) 6 Ω

d) 12 Ω

65. A fuse wire is designed to melt when the current exceeds 5 A. If its resistance is 0.1 Ω, what is the power at which it melts?

a) 2.5 W

b) 5 W

c) 12.5 W

d) 25 W

66. A battery of emf 6 V and internal resistance 0.5 Ω is connected in series with two resistors of 2 Ω and 3 Ω. What is the heat produced per second in the 3 Ω resistor?

a) 4.8 W

b) 3.6 W

c) 2.4 W

d) 6 W

67. The relaxation time of electrons in a metal is 2×10^{-14} s, and the electron density is 5×10^{28} m^{-3}. If the current density is 10^6 A/m^2, what is the drift velocity?

a) 1.25×10^{-4} m/s

b) 2×10^{-4} m/s

c) 1×10^{-3} m/s

d) 5×10^{-5} m/s

68. A wire's resistance increases from 20 Ω to 22 Ω when heated from 25°C to 75°C. What is its temperature coefficient of resistance?

a) 0.002/°C

b) 0.004/°C

c) 0.001/°C

d) 0.003/°C

69. In a Wheatstone bridge, the resistances are 5 Ω, 10 Ω, 15 Ω, and an unknown resistance X. If the bridge is balanced, what is the value of X?

a) 30 Ω

b) 20 Ω

c) 25 Ω

d) 15 Ω

70. A potentiometer wire of 5 m has a potential drop of 2 V across it. What balancing length corresponds to a cell of emf 0.8 V?

a) 2 m

b) 1.5 m

c) 3 m

d) 4 m

71. A voltmeter of resistance 500 Ω is connected across a resistor of 250 Ω in series with a 10 V battery. What is the reading of the voltmeter?

a) 3.33 V

b) 6.67 V

c) 5 V

d) 2.5 V

72. Five resistors of 10 Ω each are arranged in a pentagon. What is the equivalent resistance between two adjacent vertices?

a) 7.5 Ω

b) 6 Ω

c) 8 Ω

d) 5 Ω

73. A heater coil rated 1000 W, 220 V is cut into two equal parts and connected in parallel to the same supply. What is the total power consumed?

a) 2000 W

b) 1000 W

c) 4000 W

d) 500 W

74. In a circuit, a 6 V battery is connected to a 2 Ω resistor in series with a parallel combination of 4 Ω and 8 Ω resistors. What is the total power dissipated in the circuit?

a) 9 W

b) 6 W

c) 12 W

d) 8 W

75. The conductivity of a material is 2.5×10^7 S/m. What is its resistivity?

a) 4×10^{-8} Ω·m

b) 2×10^{-7} Ω·m

c) 5×10^{-8} Ω·m

d) 1×10^{-7} Ω·m

76. A cell delivers a current of 1 A to a 5 Ω resistor. When the resistor is changed to 11 Ω, the current becomes 0.5 A. What is the internal resistance of the cell?

a) 1 Ω

b) 2 Ω

c) 3 Ω

d) 4 Ω

77. A wire of uniform cross-section has a resistance of 8 Ω. If it is cut into four equal parts and all parts are connected in parallel, what is the equivalent resistance?

a) 0.5 Ω

b) 1 Ω

c) 2 Ω

d) 4 Ω

78. In a circuit with a 15 V battery, a 5 Ω resistor is in series with a parallel combination of two 10 Ω resistors. What is the potential difference across the parallel combination?

a) 10 V

b) 5 V

c) 7.5 V

d) 12 V

79. A bulb rated 40 W, 220 V is connected in series with a 60 W, 220 V bulb across a 440 V supply. What is the total power consumed before any bulb burns out?

a) 64 W

b) 100 W

c) 48 W

d) 80 W

80. The current through a conductor is 2 A when the potential difference is 10 V. If the potential difference is increased to 20 V, but the temperature rises, causing the resistance to increase by 20%, what is the new current?

a) 3.33 A

b) 2.5 A

c) 1.67 A

d) 4 A

81. Which of the following is true about the drift velocity of electrons in a conductor?

a) It is equal to the speed of light

b) It increases with increasing cross-sectional area

c) It is independent of the electric field

d) It is typically on the order of millimeters per second

82. A 12 V battery with internal resistance 2 Ω is connected to a 4 Ω resistor. What is the terminal voltage across the battery?

a) 8 V
b) 10 V
c) 12 V
d) 6 V

83. Why does the resistance of a metallic conductor increase with temperature?

a) The number of free electrons decreases
b) The relaxation time of electrons decreases
c) The resistivity of the material decreases
d) The cross-sectional area increases

84. In a Wheatstone bridge, if the galvanometer shows no deflection, it indicates that:

a) The current through the bridge is zero
b) The potential difference across the galvanometer is zero
c) The resistances are all equal
d) The battery is short-circuited

85. A potentiometer is preferred over a voltmeter for measuring emf because:

a) It has higher resistance
b) It draws no current from the cell at balance
c) It is less accurate but more sensitive
d) It measures resistance directly

86. Two cells of emf 2 V and 3 V with internal resistances 1 Ω and 2 Ω, respectively, are connected in parallel. What is the equivalent emf of the combination?

a) 2.4 V
b) 5 V
c) 2 V
d) 3 V

87. Which of the following quantities is a vector in the context of current electricity?

a) Current
b) Electric field
c) Resistance
d) Potential difference

88. A wire of resistance 6 Ω is stretched uniformly to triple its original length. What is its new resistance?

a) 18 Ω
b) 54 Ω
c) 12 Ω
d) 9 Ω

89. The unit of resistivity can be expressed as:

a) Ohm·meter
b) Ohm/meter
c) Ohm·meter^2
d) Ohm/meter^2

90. A 220 V, 100 W bulb is connected to a 110 V supply. What is the current through the bulb?

a) 0.25 A
b) 0.5 A
c) 0.227 A
d) 0.113 A

91. In a conductor, the current density is directly proportional to:

a) Drift velocity
b) Resistance
c) Potential difference
d) Cross-sectional area

92. A battery of emf 10 V and internal resistance 1 Ω is connected to a 9 Ω resistor. What is the efficiency of the battery (ratio of power delivered to load to total power)?

a) 90%
b) 80%
c) 50%
d) 100%

93. Which of the following is NOT a requirement for applying Kirchhoff's junction rule?

a) Conservation of charge

b) Steady current flow

c) Zero resistance in the circuit

d) Sum of currents at a junction is zero

94. Three resistors of 3 Ω each are connected in parallel with a 6 V battery. What is the equivalent resistance of the combination?

a) 1 Ω

b) 3 Ω

c) 9 Ω

d) 6 Ω

95. The purpose of a rheostat in a circuit is to:

a) Measure current

b) Vary the resistance

c) Store charge

d) Increase the emf

96. In a meter bridge experiment, the null point is at 25 cm from one end with a 4 Ω resistor in one gap. What is the unknown resistance in the other gap?

a) 12 Ω

b) 8 Ω

c) 6 Ω

d) 4 Ω

97. The resistance of a conductor is halved while keeping its length and material constant. What happens to its cross-sectional area?

a) Doubles

b) Halves

c) Remains unchanged

d) Quadruples

98. A galvanometer of resistance 50 Ω and full-scale current 1 mA is converted to a voltmeter of range 5 V. What is the series resistance required?

a) 4950 Ω

b) 5000 Ω

c) 4500 Ω

d) 5050 Ω

99. Which of the following statements is true about superconductors?

a) They have infinite resistance

b) They conduct electricity with no energy loss

c) They only work at room temperature

d) Their resistivity increases with decreasing temperature

100. A circuit consists of a 5 Ω resistor and a 10 Ω resistor in series with a battery. If the current is 2 A, what is the total emf of the battery (assuming no internal resistance)?

a) 30 V

b) 20 V

c) 15 V

d) 10 V

Answer Key

1. a) 2 Ω
2. b) 40 Ω
3. a) 24 W
4. a) 10^{-3} m/s
5. a) 1.6 V
6. a) 0.017 Ω
7. b) 3:2
8. a) 0.25 V/m
9. c) Nature of the material
10. a) 3 A
11. a) 484 Ω
12. a) 60 Ω
13. a) 3.5 V
14. c) 9 Ω and 6 Ω
15. a) 9950 Ω
16. b) Charge

17. b) 10 V

18. a) 0.005/°C

19. a) 2 A

20. b) 14.4 W

21. b) It is independent of the material's dimensions

22. a) 8 W

23. b) 2.5 V

24. a) Drift velocity per unit electric field

25. a) 8 Ω

26. a) 0.02 Ω

27. a) 10 C

28. a) 1:8

29. a) 15 A

30. b) Energy

31. a) 17:28

32. a) 4 A

33. b) 400 W

34. a) 15 Ω

35. a) 1 Ω

36. a) 10^{-14} s

37. b) 6 A

38. a) 3 Ω

39. d) Current

40. a) 250 W

41. c) Charge flowing through the conductor

42. a) 5 W

43. a) 1.8 V

44. a) 1 A

45. b) 2.67 Ω

46. a) 0.02 Ω

47. a) 200 J

48. a) 45 Ω

49. a) 3 Ω

50. b) 2:3

51. a) 4 A

52. a) 2 Ω

53. a) 120°C

54. a) 10 Ω

55. c) Remains unchanged

56. b) 16 W

57. a) 3 Ω

58. a) 1.5 V

59. c) The 40 W bulb will burn out

60. a) 5 Ω

61. a) 3 V

62. a) 1 A

63. a) 4.64×10^{-7} Ω·m

64. a) 8 Ω

65. c) 12.5 W

66. a) 4.8 W

67. a) 1.25×10^{-4} m/s

68. a) 0.002/°C

69. a) 30 Ω

70. a) 2 m

71. b) 6.67 V

72. b) 6 Ω

73. a) 2000 W

74. a) 9 W

75. a) 4×10^{-8} Ω·m

76. a) 1 Ω

77. a) 0.5 Ω

78. a) 10 V

79. a) 64 W

80. c) 1.67 A

81. d) It is typically on the order of millimeters per second

82. a) 8 V

83. b) The relaxation time of electrons decreases

84. b) The potential difference across the galvanometer is zero

85. b) It draws no current from the cell at balance

86. a) 2.4 V

87. b) Electric field

88. b) 54 Ω

89. a) Ohm·meter

90. c) 0.227 A

91. a) Drift velocity

92. a) 90%

93. c) Zero resistance in the circuit

94. a) 1 Ω

95. b) Vary the resistance

96. a) 12 Ω

97. a) Doubles

98. a) 4950 Ω

99. b) They conduct electricity with no energy loss

100. a) 30 V