



GRADE 10TH SCIENCE
CHAPTER 12

ELECTRICITY

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12. ELECTRICITY

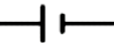



MULTIPLE CHOICE QUESTIONS

- The unit of charge is
 - Ampere
 - Coulomb
 - Farad
 - Volt
- A body can be negatively charged
 - Giving electrons to it
 - removing some electrons from it
 - giving some protons to it
 - removing some neutrons from it
- _____ is the amount of charge flowing through a particular area of cross section of a conductor in unit time.
 - Charge
 - electric current
 - potential
 - Energy
- The SI unit of electric current is
 - Ohm
 - Volt
 - Ampere
 - Coulomb
- One ampere is equal to
 - 1 C/s
 - 1Cx1s
 - 1Jx1C
 - 1J/C
- Volt is the SI unit of
 - potential difference
 - current
 - resistance
 - charge




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7. No current flows between two charged bodies when connected, if they have same
 - (a) Capacity
 - (b) potential
 - (c) charge
 - (d) none
8. The surface of the earth is taken to be at
 - (a) infinite potential
 - (b) negative potential
 - (c) positive potential
 - (d) zero potential
9. Which is bigger: a coulomb of charge or the charge of an electron?
 - (a) Coulomb of charge
 - (b) Charge of an electron
 - (c) Both are same
 - (d) None
10. How many electrons are equals to 1 coulomb?
 - (a) 6.25×10^{16}
 - (b) 6.25×10^{17}
 - (c) 6.25×10^{18}
 - (d) 6.25×10^{19}
11. _____ between two points in an electric circuit carrying some current as the work done to move a unit charge from one point to the other.
 - (a) Electric current.
 - (b) electric charge
 - (c) potential difference
 - (d) electric power
12. The SI unit of potential difference
 - (a) Ohm
 - (b) Volt
 - (c) Ampere
 - (d) Coulomb
13. What is the work done in moving a charge of Q coulomb against a potential difference of V volt?
 - (a) Q/V
 - (b) QV
 - (c) $Q+V$
 - (d) $Q-V$

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14. What is the instrument used to measure potential difference across a circuit?
- Ammeter
 - Voltmeter
 - Galvanometer
 - All
15. The device used for measuring current is
- Galvanometer
 - ammeter
 - voltmeter
 - potentiometer
16. A continuous and closed path of an electric current is called an
- electric diagram
 - electric circuit
 - electric ray diagram
 - all
17. The direction of electric current is taken as _____ to the direction of the flow of electrons.
- Same
 - Opposite
 - Both
 - None
18.  represents _____ in an electric circuit.
- electric resistor
 - electric cell
 - variable resistant
 - voltmeter
19.  represents _____ in an electric circuit.
- electric resistor
 - electric cell
 - plug key
 - voltmeter
20.  Or  represents _____ in an electric circuit.
- electric resistor
 - electric cell
 - variable resistance
 - voltmeter

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21.  represents _____ in an electric circuit
- wire crossing with joint
 - electric cell
 - variable resistance
 - wire crossing without joint
22.  or  represents _____ in an electric circuit.
- Electric bulb
 - Electric cell
 - Variable resistance
 - Electric resistor
23. The SI unit of resistance is
- Volt
 - Ohm
 - Ampere
 - Watt
24. A device used to change the resistance of a circuit is _____
- Ammeter
 - Voltmeter
 - Rheostat
 - Galvanometer
25. The resistances R_1 and R_2 are connected in parallel. The equivalent resistance of the combination is
- $R_1 + R_2$
 - $R_1 - R_2$
 - $\frac{R_1 R_2}{R_1 + R_2}$
 - $\frac{R_1 + R_2}{R_1 R_2}$
26. Three resistances of 4Ω , 5Ω and 20Ω are connected in parallel. Their combined resistance is
- 2Ω
 - 4Ω
 - 5Ω
 - 20Ω

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27. Three resistances of $1\ \Omega$ each are connected to form a triangle. The resistance between any two terminals is
(a) $3\ \Omega$ (b) $1/2\ \Omega$ (c) $2/3\ \Omega$ (d) $3/2\ \Omega$
28. The electrical appliances in the houses are connected with each other in
(a) Parallel
(b) Series
(c) a combination of series and parallel circuits
(d) none
29. Three resistors of resistances R_1 , R_2 and R_3 are connected in series. If I is the current passing through R_1
(a) 1:1 (b) 1:2 (c) 1:3 (d) 1:4
30. State which of the following is correct?
(a) Joule = Coulomb x volt
(b) Joule = Coulomb/volt
(c) Joule = Volt/ampere
(d) Joule = ampere/volt
31. When a current of I ampere is passed through a resistor of R ohm for t seconds, then the amount of heat produced is
(a) $H = I^2Rt\ \text{Cal}$
(b) $H = I^2Rt\ \text{Kcal}$
(c) $H = I^2Rt\ \text{joule}$
(d) $H = I^2Rt/4.18\ \text{joule}$
32. A _____ consists of a piece of wire made of metal or an alloy (37% lead, 63% tin).
(a) Fuse
(b) Resistor
(c) Electric plug
(d) Switch
33. How is fuse connected to the electric device?
(a) Series
(b) Parallel
(c) Both
(d) None
34. What is the current rating for the circuit used for bulbs, fans, etc?
(a) 5 A
(b) 10 A
(c) 15 A
(d) 20 A

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35. Which electrical component protects from short circuiting?

- (a) Fuse
- (b) Resistor
- (c) Electric plug
- (d) Switch

36. Electric power is given by

- (a) $P = V/I$
- (b) $P = I/V$
- (c) $P = I/VI$
- (d) $P = VI$

37. Watt is the unit of

- (a) Electric current
- (b) Electric energy
- (c) Electric power
- (d) Potential difference

38. Kilowatt hour is the unit of

- (a) Electric power
- (b) Electric resistance
- (c) Electric potential
- (d) Electric energy

39. The SI unit of electric power is

- (a) Coulomb
- (b) Ampere
- (c) Joule
- (d) Watt

40. The practical unit of electrical energy

- (a) Watt
- (b) Kilowatt
- (c) Kilowatt hour
- (d) Kilo Joule

41. How many joules are there in 1 kilowatt hour?

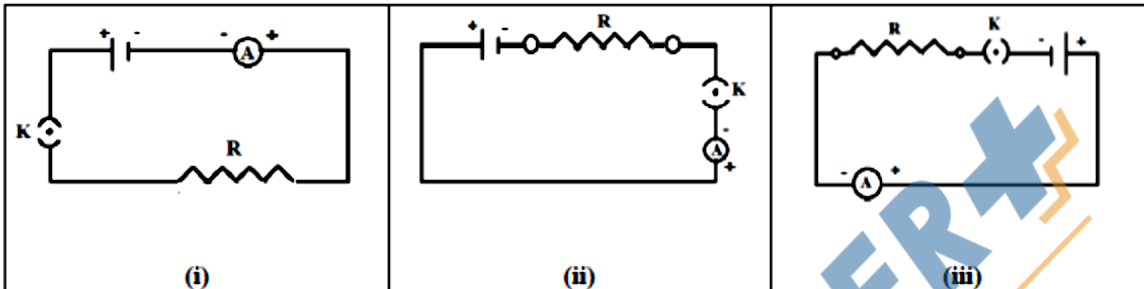
- (a) 3.6×10^3
- (b) 3.6×10^4
- (c) 3.6×10^5
- (d) 3.6×10^6

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42. A small heating element connected to a 10 V battery draws a current of 5 A. How much electric power is supplied to the heater?

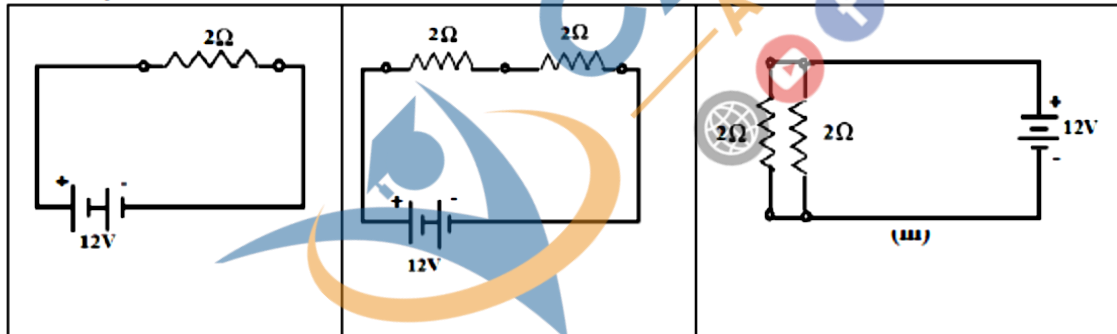
- (a) 15 W (b) 25 W (c) 2 W (d) 50 W

43. A cell, a resistor, a key and an ammeter are arranged as shown in the circuit diagrams. The current recorded in the ammeter will be:



- (a) maximum in (i)
(b) maximum in (ii)
(c) maximum in (iii)
(d) the same in all the cases

44. In the following circuits, heat produced in the resistor or combination of resistors connected to a 12 V battery will be:



- (a) same in all cases
(b) minimum in case (i)
(c) maximum in case (ii)
(d) maximum in case (iii)

45. Electrical resistivity of a given metallic wire depends upon:

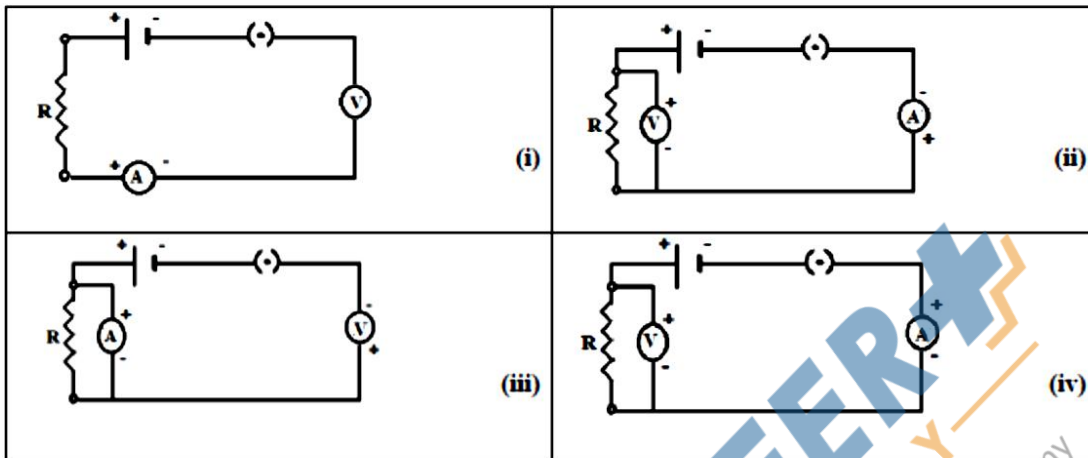
- (a) its length
(b) its thickness
(c) its shape
(d) nature of the material

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46. A current of 1 A is drawn by a filament of an electric bulb. Number of electrons passing through a cross-section of the filament in 16 seconds would be roughly:

- (a) 10^{20} (b) 10^{10} (c) 10^{18} (d) 10^{23}

47. Identify the circuit, the diagrams given below, in which the electrical components have been properly connected



- (a) (i) (b) (ii) (c) (iii) (d) (iv)

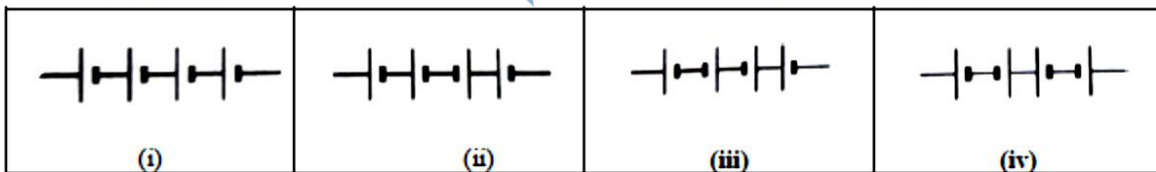
48. What is the maximum resistance which can be made using five resistors each of $(1/5) \Omega$?

- (a) $(1/5) \Omega$
(b) 10Ω
(c) 5Ω
(d) 1Ω

49. What is the minimum resistance which can be made using five resistors each of $(1/5) \Omega$?

- (a) $(1/5) \Omega$
(b) $(1/25) \Omega$
(c) $(1/10) \Omega$
(d) 25Ω

50. The proper representation of series combination of cells, for obtaining maximum potential is



- (a) (i) (b) (ii) (c) (iii) (d) (iv)

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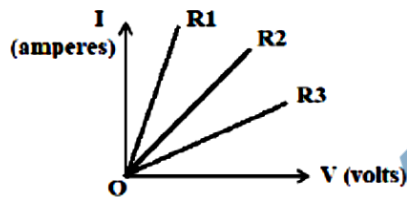
51. Which of the following represents voltage?

- (a) Work done/Current x Time
- (b) Work done x Charge
- (c) Work done x Time/Current
- (d) Work done x Charge x Time

52. A cylindrical conductor of length l and uniform area of cross-section A has resistance R . Another conductor of length $2l$ and resistance R of the same material has area of cross-section:

- (a) $A/2$
- (b) $3A/2$
- (c) $2A$
- (d) $3A$

53. A student carries out an experiment and plots the V-I graphs of three samples of nichrome wire with resistances R_1 , R_2 and R_3 respectively. Which of the following is true?



- (a) $R_1 = R_2 = R_3$
- (b) $R_1 > R_2 > R_3$
- (c) $R_3 > R_2 > R_1$
- (d) $R_2 > R_3 > R_1$

54. If the current I through a resistor is increased by 100% (assume that temperature remains unchanged), the increase in power dissipated will be:

- (a) 100%
- (b) 200%
- (c) 300%
- (d) 400%

55. The resistivity does not change if:

- (a) the material is changed
- (b) the temperature is changed
- (c) the shape of the resistor is changed
- (d) both material and temperature are changed

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56. In an electrical circuit three incandescent bulbs A, B and C of rating 40 W, 60 W and 100 W respectively are connected in parallel to an electric source. Which of the following is likely to happen regarding their brightness?
- (a) brightness of all the bulbs will be the same.
 - (b) brightness of bulb A will be the maximum
 - (c) brightness of bulb B will be more than that of A
 - (d) brightness of bulb C will be less than that of B
57. In an electrical circuit, two resistors of $2\ \Omega$ and $4\ \Omega$ respectively are connected in series to a 6 V battery. The heat dissipated by the $4\ \Omega$ resistor in 5 s will be:
- (a) 5 J
 - (b) 10 J
 - (c) 20 J
 - (d) 30 J
58. An electric kettle consumes 1 kW of electric power when operated at 220 V. A fuse-wire of what rating must be used for it?
- (a) 1 A
 - (b) 2 A
 - (c) 4 A
 - (d) 5 A
59. Two resistors of resistances $2\ \Omega$ and $4\ \Omega$ when connected to a battery will have:
- (a) same current flowing through them when connected in parallel
 - (b) same current flowing through them when connected in series
 - (c) same potential difference across them when connected in series
 - (d) different potential differences across them when connected in parallel
60. Unit of electric power may also be expressed as:
- (a) volt ampere
 - (b) kilowatt hour
 - (c) watt second
 - (d) joule second

In the following questions a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

- (a) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
 - (b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
 - (c) Assertion is correct statement but reason is wrong statement.
 - (d) Assertion is wrong statement but reason is correct statement.
61. Assertion: The connecting wires are made of copper.
Reason: Copper has very high electrical conductivity.

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62. **Assertion:** The resistance of a given mass of copper wire is inversely proportional to the square of length.
Reason: When a copper wire of given mass is stretched to increase its length, its cross-sectional area also decreases.
63. **Assertion:** In series combination of 200 W, 100 W and 25 W bulbs, the bulb of 200 W bulb shine most brightly.
Reason: 25 W has maximum resistance and so p.d. across it is maximum.
64. **Assertion:** Electric current flow from a body at 15 V to 10 V.
Reason: Electric current flow from a body at higher potential to lower potential.
65. **Assertion:** The total potential in system of resistors connected in series is equal to the sum of the individuals' potentials across each resistor.
Reason: The total current in system of resistors connected in parallel is equal to the sum of the individuals' currents moving through each resistor.
66. **Assertion:** According to Joules law of heating, the heat produced in a resistor increases with the magnitude of current, resistance and time.
Reason: According to Joules law of heating, the heat produced in a resistor is directly proportional to the square of the current for a given resistance.
67. **Assertion:** A fuse used in electric circuit has high resistance and low melting point.
Reason: During the flow of any unduly high electric current the fuse wire melts and protects the circuits and appliances
68. **Assertion:** In domestic electric circuits, the wires in the supply, usually with red insulation cover, is called live wire (or positive)
Reason: Another wire, with black insulation, is called neutral wire (or negative)
69. **Assertion:** In domestic electric circuits, metallic body is connected to the earth wire, which provides a low-resistance conducting path for the current.
Reason: It ensures that any leakage of current to the metallic body of the appliance keep its potential to that of the earth, and the user may not get a severe electric shock.
70. **Assertion:** The commercial unit of electrical energy is kilowatt hour.
Reason: The SI unit of power is volt.
71. **Assertion:** The phenomenon of the conduction of electricity through electrolytes and chemical decomposition is called cracking.
Reason: The phenomenon of the conduction of electricity through electrolytes and chemical decomposition is called electrolysis.

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ONE MARK QUESTIONS

72. The direction of electric current is taken as opposite to the direction of the flow of _____
73. When one coulomb of charge flows in one second across any cross section of a conductor, the current in it is one _____
74. The potential difference between two points in a current carrying conductor when 1 joule of work is done to move a charge of 1 coulomb from one point to the other is _____
75. The amount of work done if a body is given a charge Q coulomb raise its potential by V volt is _____
76. Positive charges move from _____ to _____ potential regions. Electrons, being negatively charged, move from lower to higher potential regions.
77. The electric potential of a charge at infinity is _____
78. Charges will move in a conductor if there is a _____ across their end.
79. _____ states that at constant temperature the steady current (I) flowing through a conductor is directly proportional to the potential difference (V) between its ends.
80. The mathematical formula to calculate resistance is _____
81. The property of a conductor to resist the flow of charges through it is called _____
82. Any material which has some resistance is called a _____
83. The resistance of an air gap is _____
84. The resistance of a closed plug-key is _____
85. If the resistors are connected to end to end, then we say that the resistors are connected in _____
86. _____ is same for all the resistors connected in series.
87. V_1 , V_2 and V_3 are the respective potential differences across the ends of the three resistors connected in series. The total potential difference across the combination of the resistors is _____
88. R_1 , R_2 and R_3 are the three resistors connected in series. The total resistance of the combination of resistors is _____
89. Three resistors of resistances 5 ohm, 10 ohm and 15 ohm are connected in series. The effective resistance of the combination is _____

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90. In a circuit, two resistors of $5\ \Omega$ and $10\ \Omega$ are connected in series. The ratio of current passing through each resistor is _____
91. If more than one resistances are connected between two points, then we say that the resistances are connected in _____
92. _____ is same for all the resistors connected in parallel combination.
93. The ratio of potential difference across the two resistors connected in parallel is equal to _____
94. I_1 , I_2 , and I_3 are the respective currents passing through the three resistances connected in parallel. The total current entering in or going out of the circuit is _____
95. R_1 and R_2 are the two resistances connected in parallel. The total resistance of the combination of resistors is _____
96. $1\ \text{kW} =$ _____ W
97. $1\ \text{kWh} =$ _____ J
98. An ammeter is connected in _____ in a circuit.
99. Voltmeter is connected in _____ in a circuit.
100. The resistance of the conductor becomes _____ when its area of cross section is increased.

