PHYSICS

BOOKS - MBD NCERT SOLUTIONS

ELECTRICITY

Example

1. What is an electric circuit ?

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2. Define electric current. What is the unit of electric current? Define it?

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3. Name a device that helps to maintain a potential difference across a conductor.

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4. What is meant by saying that the potential difference between two points is $1V$?

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5. How much energy is given to each coulomb of charge passing through a $6V$ battery ?

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6. On what factors does the resistance of a conductor depend?

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7. What is the resistance of a conductor ? State the factors on which resistance of a conductor depends? How is it related to conductivity of the conductor?

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8. Will current flow more easily through a thick wire or a thin wire of the same material when connected to the same source ? Why ?

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9. Let the resistance of an electrical component remain constant while the potential difference across the two ends of the component decreases to half its former value. What change will occur in the current through it ?

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10. What are the factors on which resistance of a conductor depends? Why are coils of electric toasters and electric irons made of an alloy rather than that of a pure metal?

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11. Which material is best conductor?

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12. Draw a schematic diagram of a circuit consisting of a battery of three cells of $2V$ each, a 5 ohm resistor, an 8 ohm resistor, and a 12 ohm resistor, and a plug key, all connected in series.

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13. Redraw the circuit of $Q.12$, putting in an ammeter to measure the current through the resistors and a voltmeter to measure the

voltage across the $12ohm$ resistor. What would be the readings in the ammeter and the voltmeter ?

A. pi

B.

C.

D.

Answer:

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14. Find the equivalent resistance when the following are connected in parallel: 1Ω and 100Ω

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15. Find the equivalent resistance when the following are connected in parallel: 1Ω and 100Ω and 1000Ω

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16. An electric lamp of 100Ω, a toaster of resistance 50Ω and a water filter of resistance 500Ω are connected in parallel to a $220V$ source. What is the resistance of an electric iron connected to the same source that takes as much current as all three appliances and what is the current through it ?

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17. What are the advantages of connecting electrical devices in parallel with the battery instead of connected them in series ?

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18. How can three resistors of resistances 2Ω, 3Ω, and 6Ω be connected to give a total resistance of

(a) 4Ω

(b) 1Ω ?

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19. What is the

(a) maximum

(b) minimum

total resistance that can be secured by combination of four resistors of resistances 2 Ω, 4 Ω, 6 Ω, 12 Ω?

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20. Why does the cord of an electric heater not glow while the heating element does ?

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21. Compute the heat generated while transferring 96000 coulombs of charge in one hour through a potential difference of $50V$.

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22. An electric iron of resistance 20Ω takes a current of $5A$. Calculate the heat developed in $30s$.

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23. What determines the rate at which energy is delivered by a current ?

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24. An electric motor takes $5A$ from a $220V$ line. Determine the power and energy consumed in $2h$.

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25. A piece of wire of resistance R is cut into five equal parts. These parts are then connected in parallel. If the equivalent resistance of this combination is R', then the ratio R/R' is :

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26. Which of the following terms does not represent electrical power in a circuit :

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27. Two conducting wires of the same material and of equal length and equal diameters are first connected in series and then in parallel in an electric circuit. The ratio of the heat

produced in series and parallel combinations would be :

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28. How is voltmeter connected in the circuit to measure potential difference between two points ?

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29. The value of current, I, flowing in a given resistor for the corresponding values of potential difference, V, across the resistor are given below :

$I(\text{ampere})$	0.5	1.0	2.0	3.0	4.0
$V(\text{volt})$	1.6	3.4	6.7	10.2	13.2

Polt a graph between V and I and calculate the resistance of the resistor.

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30. When a $12V$ battery is connected across an unknown resistor, there is a current of $2.5mA$ in the circuit. Find the value of the resistance of the resistor.

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31. A battery of $9V$ is connected in series with resistors of $0.2\Omega, 0.3\Omega, 0.4\Omega, 0.5\Omega$ and 12Ω. How much current would flow through the 12Ω resistor ?

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32. How many 176Ω resistors (in parallel) are required to carry 5 A in 220 V line ?

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33. Show how you would connect three resistors, each of resistance 6Ω, so that the combination has a resistance of

(i) 9Ω

(ii) 2Ω.

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34. Several electric bulbs designed to be used on a $220V$ electric supply line, are rated $10W$. How many lamps can be connected in parallel with each other across the two wires of $220V$ line if the maximum allowable current is $5A$?

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35. A hot plate of an electric oven connected to a $220V$ lines has two resistance coils A and B, each of 24Ω resistance, which may be used separately, in series or in parallel. What are the currents in the three cases ?

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36. Compare the power used in the 2Ω resistor in each of the following circuits :

(i) a $6V$ battery in series with 1Ω and 2Ω

resistors, and

(ii) a $4V$ battery in parallel with 12Ω and 2Ω resistors.

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37. Compare the power used in the 2Ω resistor in each of the following circuits :

(i) a $6V$ battery in series with 1Ω and 2Ω resistors, and

(ii) a $4V$ battery in parallel with 12Ω and 2Ω resistors.

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38. Two lamps, one rated $100W$ at $220V$, and the other $60W$ at $220V$, are connected in parallel to the electric mains supply. What current is drawn from the line if the supply voltage is $220V$?

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39. Which uses more energy: a 250 WTV set in 1 hour or a 1200 W toaster in 10 minutes?

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40. An electric heater of resistance 8Ω draws $15A$ from the service mains for 2 hours. Calculate the rate at which heat is developed in the heater.

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41. Explain why, tungsten is used for making the filaments of electric bulbs.

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42. Why are coils of electric toasters and electric irons made of an alloy rather than a pure metal ?

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43. Why is series arrangement not used for domestic circuits?

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44. How does the resistance of a wire vary with its:

(a) area of cross-section?

(b) diameter?

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45. Why are copper and aluminium wires usually used for electricity transmission?

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46. What is meant by Joule's heating effect due to flow of current through a conductor?

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47. Define electric power and give its unit.

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48. What do you mean by electric energy ? give the definition of its unit.

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49. Define resistance of a conductor. What is its cause? Explain the factors on which the resistance of a conductor depends.

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50. On what factors does the resistance of a conductor depend ?

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51. State Ohm's law ? How can it be verified experimentally ? Does it hold good under all conditions ? Comment.

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52. State Ohm's law. How can it be verified experimentally ? Explain with the help of a circuit diagram. Express the result graphically.

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53. What is the need of combining different resistors? What is the resulant resistance when number of resistances are connected in series?

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54. State Ohm's law. Derive the laws of resistances, when they are connected: (i) in series (ii) in parallel.

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55. With the help of a diagram derive the formula for the equivalent resistance of three resistances connected n parallels?

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56. Define electric power and give its unit.

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57. What is meant by power and energy ? Give their units.

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58. What is electric energy ? what is its si unt?

Watch Video Solution

59. What is the contribution of electricity in our daily life?

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60. What do you understand by static electricity?

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61. What are positive and negative charges? how are these produced?

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62. What is an electric circuit ?

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63. Distinguish between good conductors, resistors and insulators. Name two good conductors, two resistors and two insulators.

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64. What is electromotive force of a cell?

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65. What is the potential difference between two points in the electric field? Name its SI unit.

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66. Define volt it is unit of which physical quantity?

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67. How can we say that electric current is due to flow of charge?

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68. What is meant by electric current?

Watch Video Solution

69. What is an electric current ? Give its SI unit.

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70. How does electric current produce heat?

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71. Define resistance of conductor.also give its units

Watch Video Solution

72. What is meant by resistance of conductor define its units.

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73. What is electrical resistivity? What is its S.I. unit?

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74. What is an electric current ? Give its SI unit.

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75. Name and define the SI unit of current.

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76. What is electric energy? what is its SI unit? Also name another quantity with same unit.

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77. Which instrument is used to measure current in the circuit ? how is it connected in the circuit?

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78. Define unit of electric energy?

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79. How many joules are present in 1 kilowatt hour? Also derive numerically

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80. Why is it that very small amount of heat is produced in connecting wires whereas large amount of heat is prodiuced in heating filament of electric bubl?

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81. Give reasons for the following:

If you connect ammeter in parallel it burns

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82. On what factors does resistance depend? What is the effect on resistance, if:the length of wire is increased?

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83. On what factors does resistance depend? What is the effect on resistance, if:the area of cross section is increased.

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84. Current of 100 mA flows thrugh the filament of an electric bulb for 30 minutes calculate the charge that flow through the circuit.

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85. 60 coulomb of chare flows through a circuit for 5 minutes.calculate the current flowing in a circuit.

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86. Calculate the area of cross section of wire whose length is 10.0 m and resistance is 230 Ω take specific resistance of the material of wire as 1.84×10^{-6} ohm-m

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87. Resistance of a metal wire of length 1 m is 26 Ω at 20° C. If the diameter of the wire is 0.3 mm, what will be the resistivity of the metal at that temperature? Using Table 12.2, predict the material of the wire.

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88. In an electric circuit,a battery of five cells each of 2 v,resistors of 5 Ω 10Ω 15Ω and a key

plug are connected in series arrangement Draw its schematic diagram

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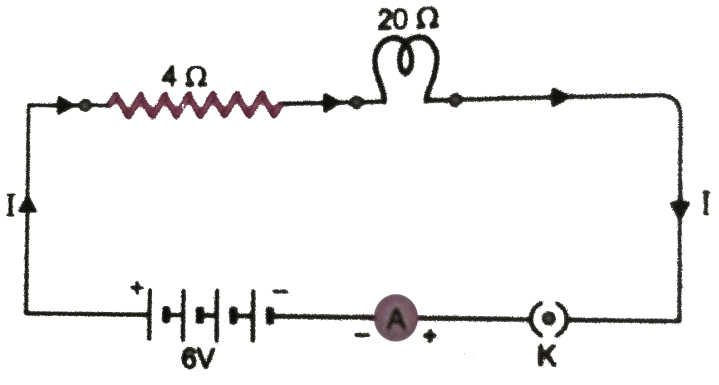
89. An electric lamp, whose resistance is 20Ω and a conductor of 4Ω resistance are connected to a $6V$ battery as shown in (Fig. 3.18) Calculate.

(a) the total resistance of the circuit,

(b) the current through the circuit, and

(c) the potential difference across the electric

lamp and the conductor.



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90. 98 J of heat is produced each second in 2 Ω resistor.Find the potential difference.

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91. The rating of an electric heater is1100 w, 220V calculate the resistance when it operates at 220 v, also calculate the energy consumed in kwh in the month of November, if the heater is used daily for 4 hours at the rated voltage.

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92. What is the (a) highest :(b) lowest total resistance that can be secured by combination of four coils of resistances 4Ω $8\ \Omega$ 10Ω 20Ω?

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93. An electric bulb of power of power 40 W is lighted daily for 8 hours for 15 days how many units of eletric energy will be consumed? also find the amount of electric bill if the rate of electricity consumption is rs.8.00 per unit

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94. A household uses the following electric appliance:

Refrigerator of rating 400 W for 10 hours eacy day, find the energy consumed.

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95. A household uses two elelctric fans of rating 80 W each for 12 hours each day, find energy consumed.

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96. A household uses six electric tubes of rating 18 W each for 6 hours each day. calculate the electricity bill of the household for the month of april if the cost per unit of electric energy is rs.4.00

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97. An electric motor takes 5 A form a 220 V line. Determine the power of the motor and the energy consumed in 4 hours

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98. Define energy.

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99. Define electrical energy and electrical power. Give their respective SI unit also.

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100. Define electric current. What is the unit of electric current? Define it?

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101. Define a volt,whose unit is this?

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102. Show the switch signs in circuit in (i) open(ii) closed circuit,

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103. Is electric potential a scalar or a vector quantity?

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104. What is practical unit of power and electric energy?

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105. Which one is having more resistance,100 W bulb or a 50 W bulb?

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106. What constitutes current in a metal wire ?

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107. The SI unit of resistance .

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108. What is an electrical conductor ? Give some examples.

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109. The unit of electric energy is :

A. Joule

B. volt

C. ohm

D. watt

Answer:

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110. The resistance of a conductor depends on its

A. its length

B. its area of cross section

C. natre of its material

D. all of these

Answer:

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111. n resistors each of resistance R first combine to give maximum effective resistgance and then combine to give minimum. The ratio of the maximum resistance is

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112. The unit of electric current is denoted by

A. coulomb

B. ampere

C. watt

D. kilowatt

Answer:

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113. Electric current is circuit is measure by:

A. ammeter

B. voltmeter

C. galvanometer

D. electric meter

Answer:

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114. How is ammeter always connected in circuits?

A. in series

B. in parallel

C. both in series and parallel

D. none of these

Answer:

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115. How is potential difference between two points expressed?

A. $V = \frac{W}{Q}$

B. Q=VW

C. $W = \frac{V}{Q}$

D. $V = \frac{Q}{W}$

Answer:

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116. How much work is done to carry 2 c of charge between two points having potential difference of 12V?

A. 2 j

B. 6 j

C. 24 j

D. $\frac{1}{6}$ j

Answer:

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117. According to ohm's law, which of these is correct?

A. $R=\frac{1}{V}$

B. $R=\frac{V}{1}$

C. $V=\frac{R}{T}$

D. $I=\frac{V}{R}$

Answer:

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118. A stream of ..... moving through a conductro xonstitues,electric current

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119. The SI unit of electric current is

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120. In an electric circuit... is always connected inparallel

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121. The equivalent resistance of number of resistors will be lesser,if they are connected in..

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122. If the potential difference across the ends of a conductor is i volt and the current flowing through the conductor is 1 ampere,the resistance of the conductor?

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