PHYSICS

BOOKS - CHETANA PHYSICS (MARATHI ENGLISH)

ELECTRIC CURRENT THROUGH CONDUCTORS

Exercise

1. What is the current electricity?

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2. What happens when a potential difference is applied across the ends of a conductor?

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3. Define electric current. State its S.I. unit and dimension

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4. Give the sign convention of electric current.

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5. A current 4A flows through an automobile headlight. How many electrons flow through the headlight in a time 2hrs?

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6. Explain the concept of drift speed occupied by the electrons in a conductor.

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7. Define current density. State its formula and units.

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8. Prove that the current density of a metallic conductor is directly proportional to the drift speed of electron.

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9. A metallic wire of diameter 0.02m contains 1028 free electrons per cubic meter. Find the drift velocity for free electrons, having an electric current of 100 amperes flowing

through the wire.

(Given : charge on electron $=1.6 \times 10^{-19}$C)

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10. The magnitude of current density in a copper wire is $500A/cm^2$. If the number of free electrons per cm^3 of copper is 8.47×10^{22}, calculate the drift velocity of the electrons through the copper wire (charge on an e $=1.6 \times 10^{-19}$ C).

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11. A copper wire of radius 0.6 mm carries a current of 1A. Assuming the current to be uniformly distributed over a cross sectional area, find the magnitude of current density.

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12. State Ohm's law.

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13. Explain the resistance of a conductor. State its unit and dimension.

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14. Define S.I. unit of resistance.

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15. Draw VI. curve of a conductor.

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16. Define conductance. State its unit and dimension

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17. Derive the relation between electric field and current density.

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18. Show that $\sigma = \frac{ne^2\tau}{m}$. Where symbols have usual meanings.

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19. A Flashlight usestwo 1.5V batteries to provide a steady current of 0.5A in the filament. Determine the resistance of the glowing filament.

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20. DC current flows in a metal piece of non-uniform cross-section. Which of these quantities remains constant along the conductor current, current density or drift speed? and Why?

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21. Explain the limitations of Ohm's law.

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22. Distinguish between ohmic substances and non-ohmic substances.

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23. Define the expression for power. State its unit.

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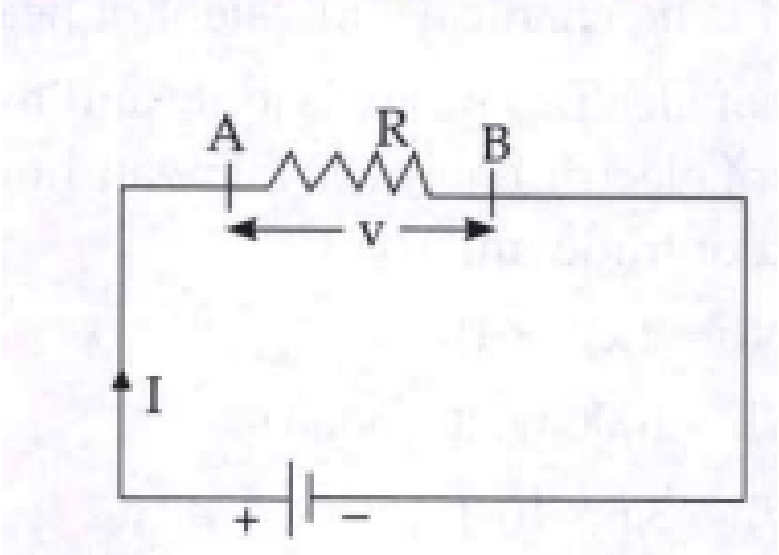
24. Explain the heating effect of electric current.



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25. An electric heater takes 6A current from a 230V supply line, calculate the power of the heater and electric energy consumed by it in 5 hours.

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26. The heating element connected to 230V draws a current of 5A. Determine the amount of heat dissipated in 1 hour (J = 4.2 J/cal).

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27. What are resistors? State its types and uses.

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28. Explain the colour code system for resistors.

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29. Find the value of resistances for the following colour code.

Blue Green Red Gold

Watch Video Solution

30. Find the value of resistances for the following colour code.

Brown Black Red Silver

Watch Video Solution

31. Find the value of resistances for the following colour code.

Red Red Orange Gold

Watch Video Solution

32. Find the value of resistances for the following colour code.

Orange White Red Gold

Watch Video Solution

33. Find the value of resistances for the following colour code.

Yellow Violet Brown silver

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34. Find the colour code for the following value of resistor having tolerance $\pm 10\ \%$

330Ω

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35. Find the colour code for the following value of resistor having tolerance $\pm 10\ \%$ for 100Ω

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36. Find the colour code for the following value of resistor having tolerance $\pm 10\ \%$

For $47k\Omega$

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37. Find the colour code for the following value of resistor having tolerance $\pm 10\ \%$

For 160Ω

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38. Find the colour code for the following value of resistor having tolerance $\pm 10\ \%$

$1k\Omega$

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39. Write a note on rheostat.

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40. Derive the expression for resistances connected in series.

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41. Derive the expression for the resistances connected inparallel.

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42. Distinguish between resistance in series and resistance in parallel.

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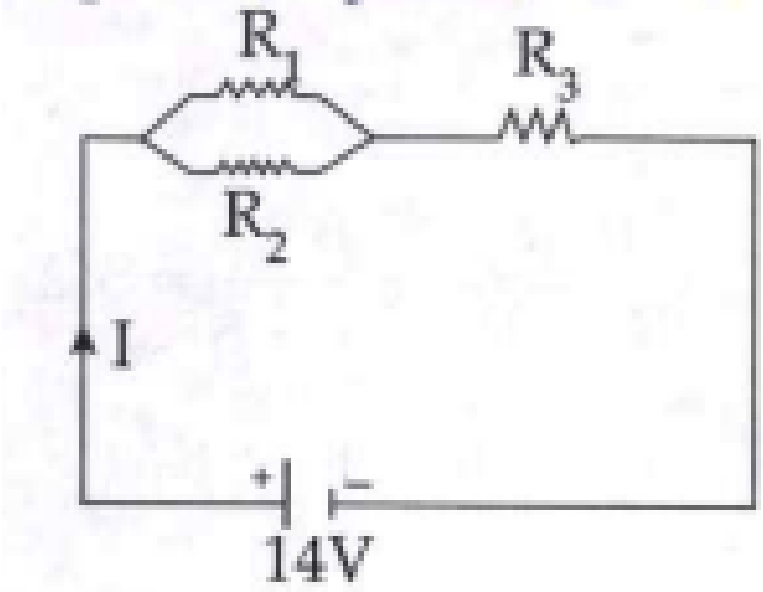
43. Calculate : total resistance and

$R_1 = 3\Omega, R_2 = 6\Omega,$ `R_3 = 5Omega, V = 14 V.



Circuit diagram

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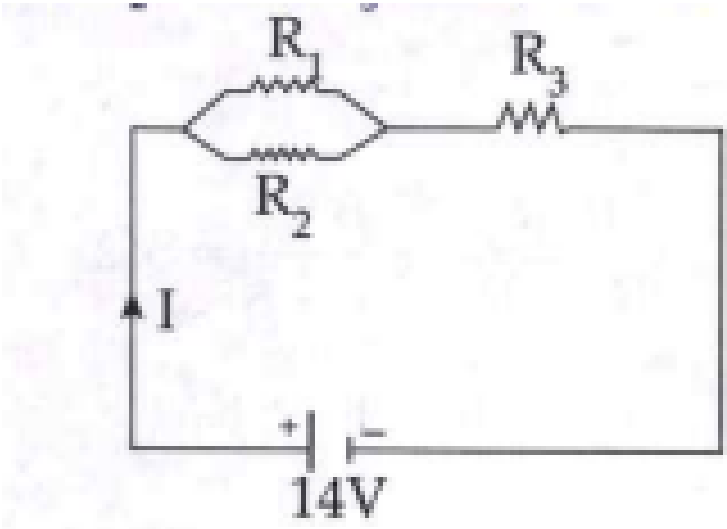
44. Calculate : total Solution: current in the following circuit.

$R_1 = 3\Omega, R_2 = 6\Omega$, `R_3 = 5 Omega, V = 14 V.



Circuit diagram

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45. Three resistors 10Ω, 20Ω and 30Ω` are connected in series combination.

Find equivalent resistance of series combination.

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46. Three resistors 10Ω, 20Ω and 31Ω` are connected in series combination.

When this series combination is connected to 12V supply, by neglecting the value of internal resistance, obtain potential difference across each resistor

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47. Two resistors $1k\Omega$ and $2k\Omega$ are connected in parallel combination.

Find equivalent resistance of parallel combination.

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48. Two resistors $1k\Omega$ and $3k\Omega$ are connected in parallel combination.

When this parallel combination is connected

to 9 V supply, by neglecting internal resistance

calculate current through each resistor.

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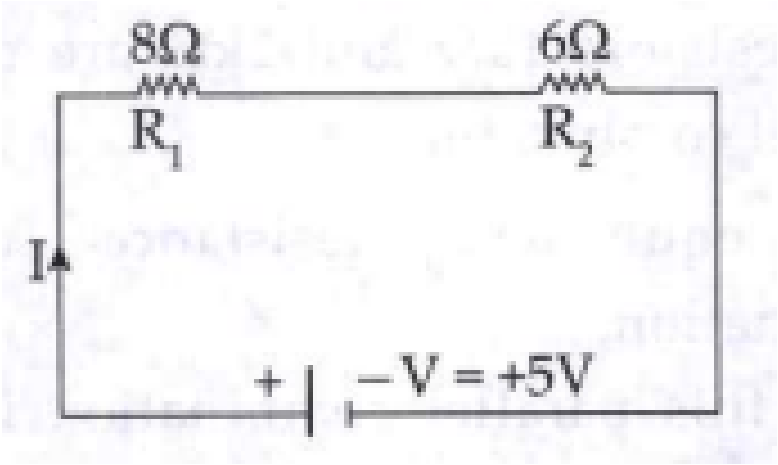
49. In given circuit diagram two resistors are

connected to a 5V supply.



Calculate potential difference across the 8Ω resistor.

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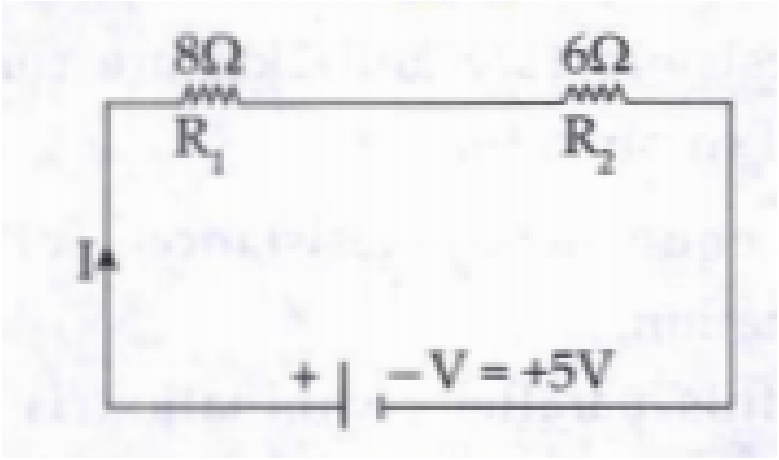
50. In given circuit diagram two resistors are connected to a 6V supply.



A third resistor is now connected in a parallel with 6Ω

resistor will the potential difference across the 8Ω resistor the larger, smaller or the same as before?

Explain the reason for your answer.

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51. A battery after a long use has a emf 24V and an internal resistance 380Ω. Calculate the maximum current drawn from the battery? Can this battery drive starting motor of car

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52. A battery of emf 12 V and internal resistance 3Ω is connected to a resistor. If the current in the circuit is 0.5 A,

Calculate resistance of resistor.

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53. A battery of emf 12 V and internal resistance 3Ω is connected to a resistor. If the current in the circuit is 0.6 A,

Calculate terminal voltage of the battery when the circuit is closed.

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54. State the factors on which the resistance of a given conductor at a particular temperature depends?

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55. Define specific resistance (resistivity). State its unit and dimension.

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56. Write the different formulae of resistivity.

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57. Define conductivity of a material. State its unit and dimension.

Watch Video Solution

58. Write different formulae of conductivity.

Watch Video Solution

59. Calculate the resistance per metre, at room temperature, of a constantan (alloy) wire of diameter 1.25mm. The resistivity of constant of an at room temperature is $5.0 \times 10^{-7} \Omega$m.

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60. A 6m long wire has diameter 0.5 mm. Its resistance is 50Ω. Find the resistivity and conductivity.

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61. What is the resistance of one of the rails of a railway track 20 km long at 20°C? The cross section area of rail is 25 cm^2 and the rail is made of steel having resistivity at 20° C as

made of steel having resistivity at 20° C as $6 \times 10^{-8} \Omega$m.

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62. Explain the effect of temperature on resistance?

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63. Explain the effect of temperature on resistivity.

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64. Explain phenomenon of superconductivity.

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65. State the applications of superconductivity.

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66. A piece of platinum wire has resistance of $2.5\Omega 0^{\circ}C$. If its temperature coefficient of resistance is $4 \times 10^{-3}/^{\circ}C$. Find the resistance of the wire at $80^{\circ}C$.

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67. A silver wire has a resistance of 4.2Ω at $27^{\circ}C$ and resistance 5.4Ω at $100^{\circ}C$. Determine the temperature coefficient of resistance.

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68. Define : Internal resistance

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69. Define : Electromotive force

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70. Define : Terminal potential differences.

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71. State the advantages of cells in series.

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72. State the advantages and disadvantages of cells in parallel

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73. Derive the expression for E_eq and r_eq when two cells are connected in parallel.

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74. State different types of electrical cells.

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75. Explain hydrogen fuel cell vehicles are more environment friendly

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76. Distinguish between cells in series and cells in parallel.

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77. Distinguish between primary cells and secondary cells.

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78. Find the steady curent flowing through a metal wire when 3×10^8 electron pass across a cross-section of the wire in one minute.

(Charge on an electron = 1.6×10^{-9}C)

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79. A current of 800 mA is passed through an electric lamp for one minute. Find the number of electrons passing through it if the charge of electron is 1.6×10^{-19} C.

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80. Write down in order the colours of bands for the following carbon resistors:

$10K\Omega$, 10% tolerance

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81. Write down in order the colours of bands for the following carbon resistors:

470Ω, 5% tolerance.

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82. Find the values of the resistors with the following colour code:

Green, White, Yellow, Gold

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83. Find the values of the resistors with the following colour code:

Grey, Red, Yellow, Silver.

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84. Find the resistance of a copper cable of length 8 km, diameter 3mm, if its specific resistance is 1.7×10^{-8} ohm-metre.

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85. Calculate the specific resistance of the material of a wire having a resistance of 4.4Ω, length 1.1 m and radius 0.2 mm.

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86. A current of 0.4 A flows through a lamp, when a P.D. of 230 V is applied to it. Find the power of the lamp.

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87. An electric lamp is rated 40 W, 100 V. Find the current in the lamp and the resistance of the lamp.

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88. The resistance of a tungsten wire is 1000Ω at $0^{\circ}C$ and 1045Ω at $10^{\circ}C$. Calculate the temperature coefficient of resistance of tungsten.

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89. The emf of a battery is 21 volt. When it sends a current of 1 ampere through an external resistance, the P.D. across its terminalsfalls to 19 volt. What is the internal resistance of battery?

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90. What current flowing through a resistance coil of 10 ohm would produce 70 cal/min? J = 4.2 J/cal.

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91. Calculate the heat produced per second by an electric heater connected to 240 V mains and carrying a current of 4A.

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92. Two wires A and B of the same material are of uniform cross-section. Wire A is twice as long B and its diameter is thrice that of B. If the resistance of wire A is 10 ohm, find that of wire B.

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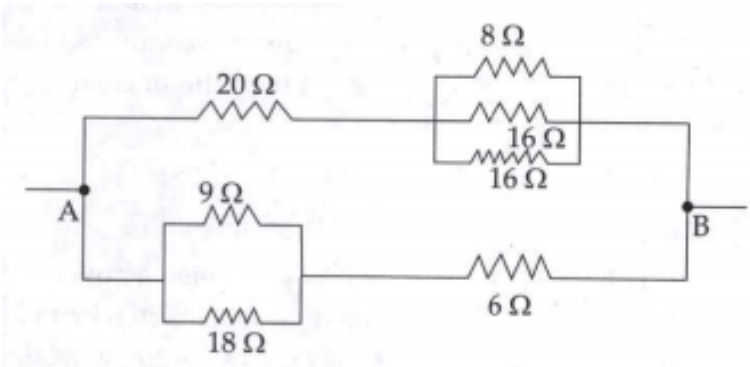
93. Resistance are connected between the points A and B as shown. Find the equivalent

resistance between A and B.



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94. Two resistances connected in series have an effective value of 20Ω. When connected in parallel, the effective value is 5Ω. What are the values of resistance?

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95. A wire has a resistance of 6Ω at $30^{\circ}C$ and 6.5Ω at $100^{\circ}C$. Determine the temperature co-efficient of resistance of the wire. What will be resistance of a wire at 0∘C?

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96. A Cell sends a current of 0.5 A through a 2Ω resistance. If the resistance is increased by

5Ω, the current falls to 0.25 A. Find the emf of the cell and its internal resistance.

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97. A wire of circular cross-section and 25 Ω resistance is uniformly stretched until its new length is three times the original length. Find its resistance.

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98. Through a coil of wire of resistance 42Ω, a current of 2A is passed for 5 minutes. How much electric charge has flown through the coil? How much heat has been produced?

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99. A 75 W lamp is designed to be used on 15 V. What is its resistance? If the lamp is to be used on 120 V, what resistance must be connected in series with it?

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100. Choose correct alternative.

You are given four bulbs of 25 W, 40 W, 60 W and 100 W of power, all operating at 230 V. Which of them has the lowest resistance?

A. 25 W

B. 40 W

C. 60 W

D. 100 W

Answer:

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101. Choose correct alternative.

Which of the following is an ohmic conductor?

A. transistor

B. vacuum tube

C. electrolyte

D. nichrome wire

Answer:

Watch Video Solution

102. Choose correct alternative.

A rheostat is used

A. to bring on a known change of resistance in the circuit to alter the current

B. to continuously change the resistance in any arbitrary manner and there by alter the current

C. to make and break the circuit at any instant

D. neither to alter the resistance nor the current

A. A. to bring on a known change of resistance in the circuit to alter the current

B. B. to continuously change the resistance in any arbitrary manner and there by alter the current

C. C. to make and break the circuit at any instant

D. D. neither to alter the resistance nor the current

Answer:

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103. Choose correct alternative.

The wire of length L and resistance R isstretched so that its radius of cross-section is halved. What is its new resistance?

A. 5R

B. 8R

C. 4R

D. 16R

Answer:

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104. Choose correct alternative.

Masses of three pieces of wires made of the same metal are in the ratio $1:3:5$ and their

lengths are in the ratio $5:3:1$. The ratios of their resistances are

A. $1:3:5$

B. $5:3:1$

C. $1:15:125$

D. $125:15:1$

Answer:

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105. Choose correct alternative.

The internal resistance of a cell of emf 2V is 0.1Ω. It is connected to a resistance of $0.\ 9\Omega$. The voltage across the cell will be.

A. 0.5 V

B. 1.8V

C. 1.95 V

D. 3 V

Answer:

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Watch video solution

106. Choose correct alternative.

100 cells each of emf 5V and internal resistance 1Ω are to be arranged so asto produce maximum current in a 25Ω resistance. Each row contains equal number of cells. The number of rows should be

A. 2

B. 4

C. 5

D. 100

A. A. 2

B. B. 4

C. C. 5

D. D. 100

Answer:

Watch Video Solution

107. Choose correct alternative.

Five dry cells each of voltage 1.5 V are connected as shown in diagram. What is the

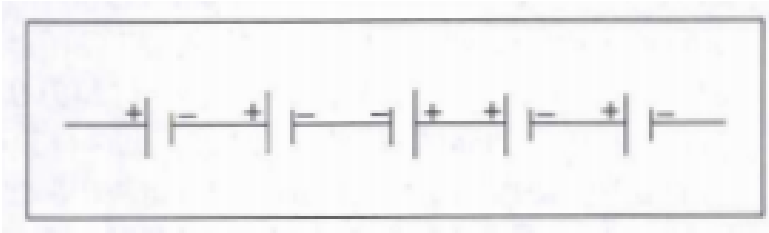
overall voltage with this arrangement?

A. 0V

B. 4.5V

C. 6.0V

D. 7.5V



A. A. 0V

B. B. 4.5V

C. C. 6.0V

D. D. 7.5V

Answer:

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108. Choose correct alternative.

A thick wire of resistance 25Ω is drawn into a thin wire such that itslength becomes four times. The new resistance of the wire will be

A. 50 Ω

B. 25 Ω

C. 100 Ω

D. 400 Ω

A. 50Ω

B. 25Ω

C. 100Ω

D. 400Ω

Answer:

Watch Video Solution

109. Choose correct alternative.

A current of 1 mA is flowing in a copper wire.

The number of electrons crossing any point in the conductor per second will be

A. 6.25×10^8

B. 6.25×10^{15}

C. 6.25×10^{19}

D. 6.25×10^{31}

Answer:

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110. Choose correct alternative.

The emf of a primary cell is 2 volt. When it is shorted then it gives a current of 4A. Its internal resistance will be

A. 0.5Ω

B. 2Ω

C. 5Ω

D. 8Ω

Answer:

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111. Choose correct alternative.

When two resistances are connected in parallel then the equivalent resistance is $6/5\Omega$. When one of the resistances is removed then the effective resistance is 2Ω. The resistance of the wire removed will be

A. 3 Ω

B. 2 Ω

C. 3 / 5 Ω

D. 6 / 5 Ω

A. 3Ω

B. 2Ω

C. $3/5\Omega$

D. $6/5\Omega$

Answer:

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112. Choose correct alternative.

The resistance of a conductor is 60Ω. The curve between log V and log I will be

A. Equation of circle

B. Equation of hyperbola

C.Equation of straight line

D.Equation of parabola

A. circle

B. hyperbola

C. straight line

D. parabola

Answer:

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113. Choose correct alternative.

The following wires are made of same material. The wire whose resistance is maximum will be

A. 2 mm radius and 80 m length

B. 2 mm radius and 40 m length

C. 1 mm radius and 40 m length

D. 1mm radius and 80 m length

A. 2 mm radius and 80 m length

B. 2 mm radius and 40 m length

C. 1 mm radius and 40 m length

D. 1mm radius and 80 m length

Answer:

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114. Choose correct alternative.

Ohm's law is valid for

A. only metallic conductors

B. Insulators

C. non-metallic conductors

D. only conductor

A. only metallic conductors

B. Insulators

C. non-metallic conductors

D. only conductor

Answer:

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115. Choose correct alternative.

The specific resistance of the material of a conductor depends on its

A. temperature

B. length

C. radius

D. size

Answer:

Watch Video Solution

116. Choose correct alternative.

The best material for making resistance boxes is

A. iron

B. silver

C. brass

D. constantan

A. iron

B. silver

C. brass

D. constantan

Answer:

Watch Video Solution

117. Choose correct alternative.

An electric cable contains a single copper wire of radius 9 mm. Its resistance is 5Ω. This cable is replaced by six insulated copper wires, each of radius 3 mm. The resultant resistance of cable will be

A. 7.5Ω

B. 45Ω

C. 90Ω

D. 270Ω

A. 7.5Ω

B. 45Ω

C. 90Ω

D. 270Ω

Answer:

Watch Video Solution

118. Choose correct alternative.

The emf of a cell of negligible internal resistance is 2 V. It is connected to the series combination of 2Ω, 3Ω and 5Ω resistances. The potential difference across 3Ω resistance will be (in volt)

A. 0.6

B. $2/3$

C. 3

D. 6

Answer:

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119. Choose correct alternative.

The length of four wires are in the ratio $1:2:3:4$. All the four wires are of same material and their radii are also same. If the wires are connected to a battery in succession, then the ratio of currents flowing in them will be

A. $1:2:3:4$

B. $4:3:2:1$

C. $12:6:4:3$

D. None of these

A. $1:2:3:4$

B. $4:3:2:1$

C. $12:6:4:3$

D. none of these

Answer:

Watch Video Solution

120. Choose correct alternative.

A potential difference of 20 V is applied across the ends of a coil. The amount of heat generated in it is 800 cal/s. The value of resistance of the coil will be

A. 0.012Ω

B. 0.12Ω

C. 1.2Ω

D. 12Ω

Answer:

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121. Choose correct alternative.

A wire emits 80 J energy in 10 second when a current of 2A is passed through it. The resistance of the wire in ohm will be

A. 0.5

B. 2

C. 4

D. 20

Answer:

Watch Video Solution

122. Choose correct alternative.

40 mA current flows for 40 second in a wire.

The charge on the wire is

A. $1.6 \times 10_{19}$ C

B. 0

C. 1.6 C

D. 9.1 C

Answer:

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123. Choose correct alternative.

The radiusof a copper wire is doubled.Its specific resistance

A. increases

B. decreases

C. remains same

D. None of these

Answer:

Watch Video Solution

124. Choose correct alternative.

The equivalent resistance of resistors in series is always

A. equal to the mean of component resistors

B. less than the lowest of component resistors

C. in between the lowest and the highest of component resistors

D. equal to the sum of the component resistors

Answer:

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125. Choose correct alternative.

Conductivity is the reciprocal of

A. drift velocity

B. resistivity

C. inductance

D. permittivity

Answer:

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126. Choose correct alternative.

Given a current carrying wire of non-uniform cross section. Which of the following is

constant throughout the length of the wire?

A. current, electric field and drift speed

B. drift speed only

C. current and drift speed

D. current only

A. current, electric field and driftspeed

B. driftspeed only

C. current and drift speed

D. current only

Answer:

Watch Video Solution

127. Choose correct alternative.

Overloading of an electric circuit implies

A. connecting a number of electric devices in series with the power supply

B. connecting high resistance device

C. drawing a large current

D. none of these

Answer:

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128. Choose correct alternative.

The terminal voltage across a cell is more than its emf if the another cell of

A. higher emf is connected in parallel to it

B. less emf is connected in parallel to it

C. less emf is connected in series with it

D. higher emf is connected in series with it

Answer:

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129. Choose correct alternative.

Copper and silicon is cooled from 300 K to 60 K, the specific resistance

A. decreases in copper but increasesin silicon

B. increasesin copper but decreasesin silicon

C. increasesin both

D. decreasesin both

Answer:

Watch Video Solution

130. Choose correct alternative.

emf of a cell is 2.2 volt. When resistance $R = 5\Omega$ is connected in series potential drop across the cell becomes 1.8 volt. Value of internal resistance of the cell is

A. $7/2$

B. $9/10$

C. $10/9$

D. $12/7$

Answer:

Watch Video Solution

131. Choose correct alternative.

A 100 W, 200 V bulb is connected to a 160 volts supply. The actual power consumption would be

A. 64 W

B. 80 W

C. 100 W

D. 125 W

A. 64 W

B. 80 W

C. 100 W

D. 125 W

Answer:

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132. Choose correct alternative.

The potential difference between two electrodes of a galvanic cell, in an open circuit, is known as

A. current

B. electromotive force

C. Electrode difference

D. impedance

A. current

B. electromotive force

C. potential difference

D. impedance

Answer:

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133. Choose correct alternative.

The number of equal resistance connected in series have effective resistance of 32Ω. When the same resistances are connected in parallel then effective resistance is 2Ω. The number of

resistances are

A. 4

B. 8

C. 5

D. 10

A. 4

B. 8

C. 5

D. 10

Answer:

Watch Video Solution

134. Choose correct alternative.

The work done by a cell to circulate the charge of $2\mu_C$ is 10×10^{-6} J. The emf of cell is

A. 5 volt

B. 2 volt

C. 3 volt

D. 1.5 volt

Answer:

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135. Choose correct alternative.

The specific resistance of the material of a conductor depends on its

A. area of cross-section

B. temperature

C. length

D. pressure

Answer:

Watch Video Solution

136. Choose correct alternative.

The internal resistance of an ideal cell is

A. zero

B. 1Ω

C. infinite

D. changes irregularly

A. zero

B. 1Ω

C. infinite

D. changes irregularly

Answer:

Watch Video Solution

137. Choose correct alternative.

Two wires of same material and same length are connected in series. The area of cross section of wires is in ratio $3:1$. The resistance of thicker wire is 10Ω. The total resistance of combination is

A. 10Ω

B. 20Ω

C. 30Ω

D. 40Ω

Answer:

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138. Choose correct alternative.

A wire of length 20 cm has resistance 5Ω. It is stretched up to 60 cm, its resistance will be

A. 10Ω

B. 30Ω

C. 45Ω

D. 60Ω

Answer:

Watch Video Solution

139. Choose correct alternative.

If R is the resultant resistance of n similar resistance connected in parallel. The resultant

resistance when these resistances are connected in series will be

A. nR

B. n^2R

C. R/n

D. R/n^2

Answer:

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140. Choose correct alternative.

How many cells of emf 1.5 volt and internal resistance 0.5Ω must be connected in series with 20Ω resistance to give the current of 0.6A in circuit?

A. 4

B. 5

C. 8

D. 10

Answer:

Watch Video Solution

141. Choose correct alternative.

Six cells each of emf 1.4 volt and internal resistance $1/6\Omega$ are connected in series. It is found that two cells are wrongly connected. The current through external resistance of 1.8Ω is

A. 0.5 A

B. 1 A

C. 1.5 A

D. 2 A

A. 0.5 A

B. 1 A

C. 1.5 A

D. 2 A

Answer:

Watch Video Solution

142. Choose correct alternative.

Two resistance of 3Ω and 2Ω are connected in series to a cell of emf 3 volt and internal

resistance of 1Ω. The potential difference across 3Ω resistance will be

A. 1 volt

B. 0.5 volt

C. 1.5 volt

D. 2 volt

A. 1 volt

B. 0.5 volt

C. 1.5 volt

D. 2 volt

Answer:

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143. Choose correct alternative.

In which one of the following substances the resistance decreases with increase in temperature?

A. copper

B. silver

C. carbon

D. constantan

Answer:

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144. Choose correct alternative.

One volt is equal to

A. 1 Jalle

B. 1 ohm/ampere

C. 1 Joule/coulomb

D. 1 newton/second

Answer:

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145. Choose correct alternative.

If R_1 and R_2 are the filament resistances of a 100 watt bulb and 200 watt bulb designed to operate on the same voltage, then

A. $R_1 = 2R_2$

B. $R_1 = 3R_2$

C. $R_2 = 3R_1$

D. $R_2 = 2R_1$

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146. Choose correct alternative.

A uniform copper wire of resistance 5Ω is uniformly stretched, doubled the new resistance of the wire will be

A. 5Ω

B. 10Ω

C. 15Ω

D. 20Ω

Answer:

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147. Choose correct alternative.

A current of 3.2 ampere is flowing in a conductor. The number of electrons per second through the conductor will be [Charge on the electron $=1.6 \times 10^{-19}$ coulomb].

A. 2×10^{19} electrons/sec

B. 3×10^{19} electrons/sec

C. 3×10^{20} electrons/sec

D. 6.4×10^{20} electron/sec

Answer:

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148. Choose correct alternative.

The length of a conductor is halved. Its conductance will be

A. unchanged

B. halved

C. doubled

D. $\frac{1}{4}$ of the original conductance

Answer:

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149. Choose correct alternative.

When potential difference is not applied across a conductor,

A. charges inside a conductor do not move

B. net flow of charges is in one direction

C. net rate of flow of charges is zero

D. none of the above

Answer:

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150. Choose correct alternative.

A wire carries a current of 1 A. The number of

electrons passing though a cross section of wire per second is (given : e = 1.6×10^{-19} C)

A. 6×10^{15}

B. 6.25×10^{18}

C. 6.25×10^{19}

D. 6×10^{20}

Answer:

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151. Choose correct alternative.

A wire of resistance $100\Omega$is cut into 10 equal parts and all 10 parts are bundled together. The equivalent resistance of the wire now becomes.

A. 1Ω

B. 10Ω

C. 50Ω

D. 100Ω

Answer:

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152. Choose correct alternative.

A thin, uniform wire of resistance 40Ω is bent to form a circle. The resistance between any two diametrically opposite points is

A. 10Ω

B. 15Ω

C. 20Ω

D. None of the above

A. 10Ω

B. 15Ω

C. 20Ω

D. None of the above

Answer:

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153. Choose correct alternative.

A wire of resistance R is cut into 'n' equal parts. They are connected in parallel. The equivalent resistance now beomes,

A. R/n^2

B. n^2R

C. R/n

D. n.R

Answer:

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154. Choose correct alternative.

Two wires have their lengths in the ratio $5:3$

and radii in the ratio $1:2$. Ratio of their resistivity is $3:4$. The ratio of resistance is

A. $1:5$

B. $2:1$

C. $1:2$

D. $5:1$

Answer:

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155. Choose correct alternative.

If a resistor has three colour bands namely red, red and orange and the fourth band is gold, then its value is

A. $22k \pm 5\ \%$

B. $2.2k \pm 5\ \%$

C. $22 \pm 5\ \%$

D. o.22 k

Answer:

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Watch video solution

156. Choose correct alternative.

A battery of emf 2V sends a current of 0.1A when connected to a resistance 18Ω, The internal resistance of cell is

A. 1Ω

B. 2Ω

C. 3Ω

D. 4Ω

Answer:

Watch Video Solution

157. Choose correct alternative.

A wire of resistance 20Ω is uniformly stretched to thrice its original length. The length change in its resistance is

A. 60Ω

B. 160Ω

C. 180Ω

D. 200Ω

Answer:

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158. Choose correct alternative.

A battery of emf 10 volt is connected to a voltmeter of resistance 135Ω. Find the reading of the voltmeter if internal resistance of the cell is 15Ω

A. 8 volt

B. 9 volt

C. 10 volt

D. none of the above

A. 8 volt

B. 9 volt

C. 10 volt

D. none of the above

Answer:

Watch Video Solution

159. Choose correct alternative.

As the temperature of a metallic conductor increases, itsresistance

A. always increases

B. always decreases

C. may increase or decrease

D. none of above

Answer:

 Watch Video Solution

160. Choose correct alternative.

Equivalent resistance in parallel combination is

A. greater than the greatest resistance in the combination

B. less than the least resistance in the combination

C. average of all the resistors in the combination

D. equal to sum of all the resistors in the combination

A. greater than the greatest resistance in the combination

B. less than the least resistance in the combination

C. average of all the resistorsin the combination

D. equal to sum of all the resistors in the combination

Answer:

Watch Video Solution

161. Choose correct alternative.

When resistors are connected in parallel combination

A. Potential difference across each resistor is same

B. different current passes through unequal resistors

C. equivalent resistance is equal to sum of the reciprocals of the resistors in the combination

D. Both A & B

A. Potential difference across each resistor is same

B. different current passes through unequal resistors

C. equivalent resistance is equal to sum of the reciprocals of the resistorsin the combination

D. (A) and (B)

Answer:

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162. Choose correct alternative.

Advantage of fuel cell over petrol is that its only product is

A. oxygen

B. water

C. nitrogen

D. CO_2

Answer:

Watch Video Solution

163. Choose correct alternative.

S.I. unit of current density is

A. A/m

B. A/m^2

C. A/m^3

D. Am^2

Answer:

Watch Video Solution

164. Choose correct alternative.

The quantity $\left(\frac{R_t - R_0}{t}\right)$ represents

A. rate of change of resistance with time

B. rate of change of resistance with temperature

C. rate of change of resistance with pressure

D. rate of change of resistance with volume

A. rate of change of resistance with time

B. rate of change of resistance with temperature

C. rate of change of resistance with pressure

D. rate of change of resistance with volume

Answer:

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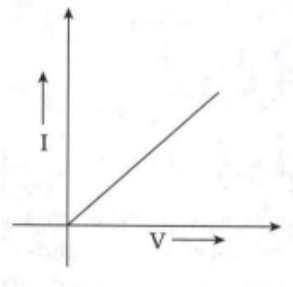
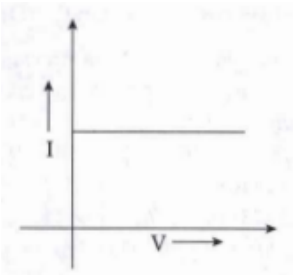
165. Choose correct alternative.

Which of the following graphs represent and ohmic resistance?

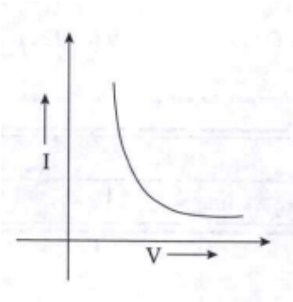
A.



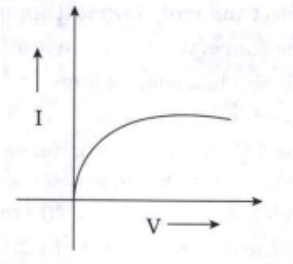
B.

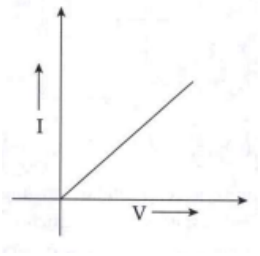


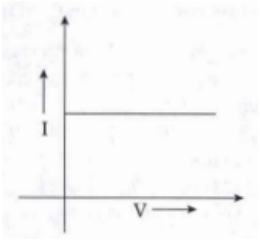
C.

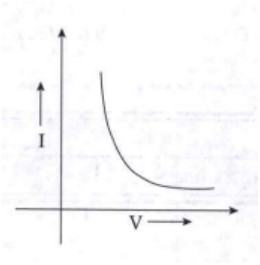


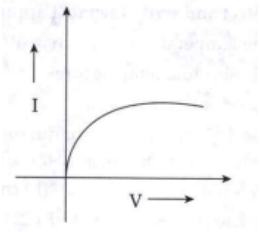
D.



A. 

B. 

C. 

D. 

Answer:

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166. Choose correct alternative.

The direction of conventional current flowing through a metal due to applied potential difference or electric field is

A. same as direction of field

B. from higher potential end to lower potential end

C. from lower potential end to higher potential end

D. both (A) and (B)

Answer:

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167. Choose correct alternative.

The number of cells of 1.5 V / 500 mA rating required in series parallel combination to provide 1500 mA current at 3V would be

A. 2

B. 4

C. 5

D. 6

A. 2

B. 4

C. 5

D. 6

Answer:

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168. Choose correct alternative.

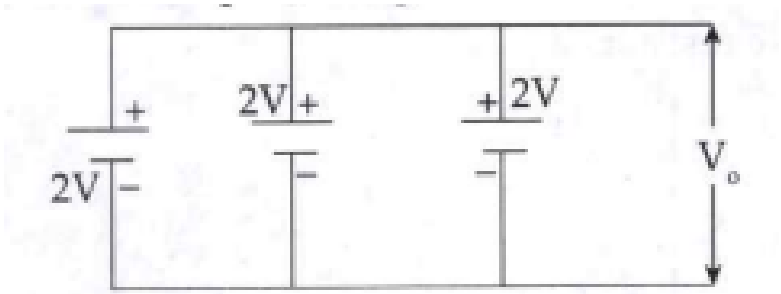
Total output voltage is

A. $2/3$ V

B. $3/2$V

C. 2V

D. 6V



A. $2/3$ V

B. $\frac{3}{2}V$

C. 2V

D. 6V

Answer:

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169. Choose correct alternative.

I.V. graph for conductor makes an angle θ with Y-axis. Then the resistence of conductor is given by

A. $\sin\theta$

B. $\cos\theta$

C. $\tan\theta$

D. $\cot\theta$

Answer:

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170. Select and write the most appropriate answer from the given alternatives

The temperature at which resistance of certain metals completely disappears is known as

A. absolute temperature

B. Curie temperature

C. critical temperature

D. neutral temperature

Answer:

Watch Video Solution

171. Select and write the most appropriate answer from the given alternatives

The I.V. graph of a conductor makes an angle θ with x - axis. Here, V denotes voltage and I denotes current. The resistance of conductor is given by

A. $\sin\theta$

B. $\cos\theta$

C. $\tan\theta$

D. $\cot\theta$

Answer:

Watch Video Solution

172. Select and write the most appropriate answer from the given alternatives

A wire carries a current of 1.2 A when a potential difference of 1.8 V is applied across it. Then the conductance of wire is

A. 0.67Ω

B. 0.75Ω

C. 1.5Ω

D. 2.5Ω

Answer:

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173. Define the temperature coefficient of resistance of material.

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174. State the factors on which the specific resistance of a conductor depends.

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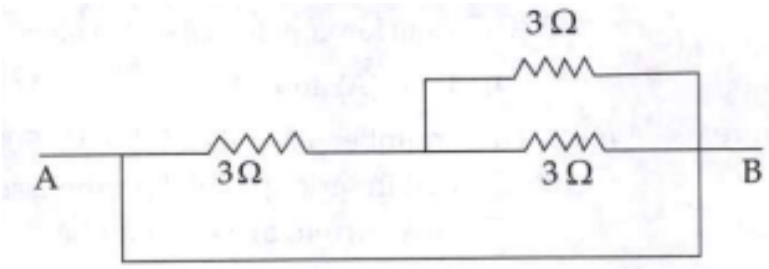
175. Calculate the resistance between A and B



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176. Explain hydrogen fuel cell vehicles are more environment friendly

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177. State the uses of rheostat.

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178. Define current density. State its dimension and unit.

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179. Distinguish between cells in series and cells in parallel.

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180. The resistance of a copper wire is 20Ω at $0^{\circ}C$. Find the resistance at $60^{\circ}C$ if the temperature coefficient of resistance of material is $0.004/^{\circ}C$.

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181. Prove that for a current carrying conductor current density is directly proportional to drift velocity.

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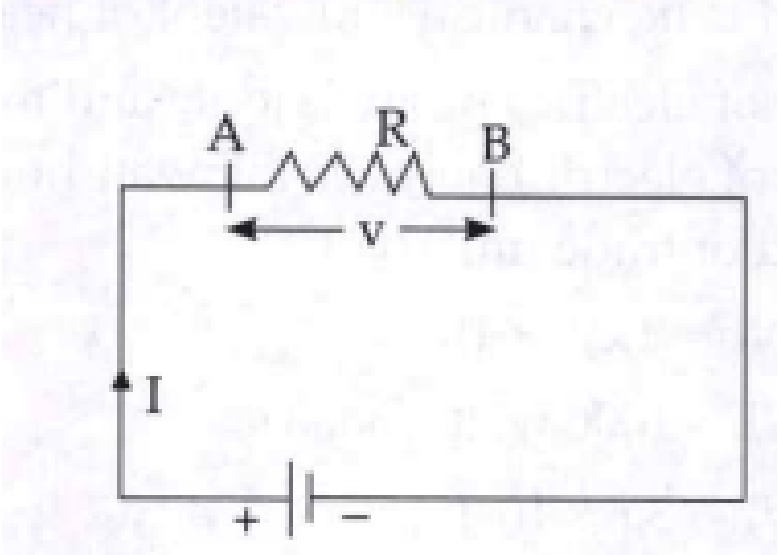
182. Explain the heating effect of electric current.



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183. A voltmeter is connected across a battery of emf 12 V and internal resistance of 10 Q. If the voltmeter resistance is 230 Q, what reading will be shown by voltmeter?

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