



PHYSICS

BOOKS - MODERN PUBLICATION

ELECTRICITY

Example

1. The filament of an electric bulb draws a current of 0.4 ampere. Calculate the amount of charge flowing through the filament if the

bulb glows for 2 hours. Also calculate the number of electrons passed.



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2. Calculate the work done in moving a charge of $2C$ through a potential difference of 5 V



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3. A polythene piece is rubbed with wool. It is found to acquire a negative charge of

3.2×10^{-7} C. Estimate the number of electrons transferred to the piece.



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4. How many electrons pass through a wire in 1 minute if the current passing through the wire is 200 Ma?



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5. 2.5 mJ of work is done in moving a charge of 10^{-3} from one point to another. What is the potential difference between the two points ?



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6. 10^{20} electrons, each having a charge of $1.6 \times 10^{-19} C$, pass from a point A towards another point B in 0.1 s. What is the current in ampere ? What is its direction ?



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7. How many free electrons flowing per second will constitute 1A current?



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8. Find the resistance of a nichrome wire of length 1m and area of cross-section 2mm^2 . The resistivity of nichrome is $100 \times 10^{-6}\text{Ohm} - \text{m}$.



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9. Find the resistance of a nichrome wire of length 2m and area of cross-section 2mm^2

$$\rho_{\text{nichrome}} = 100 \times 10^{-6} \text{ Ohm} - \text{m}.$$



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10. Find the resistance of a nichrome wire of length 1m and area of cross-section 4mm^2 .

$$\rho(\text{nichrome}) = 100 \times 10^{-6} \text{ Ohm} - \text{m}.$$



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11. Find the resistance of a copper wire of length 1m and area of cross-section $2mm^2$. The specific resistance of copper = $1.7 \times 10^{-8} Ohm - m$.



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12. Find the resistance of an ebonite rod of length 1m and area of cross section $2mm^2$. The resistance of ebonite = $10^{16} Ohm - m$.



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13. You have a resistance of 50Ω . You cut it into four equal parts .What is the resistance of each part?



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14. The length of a wire is doubled by pulling it.Find the new resistance.



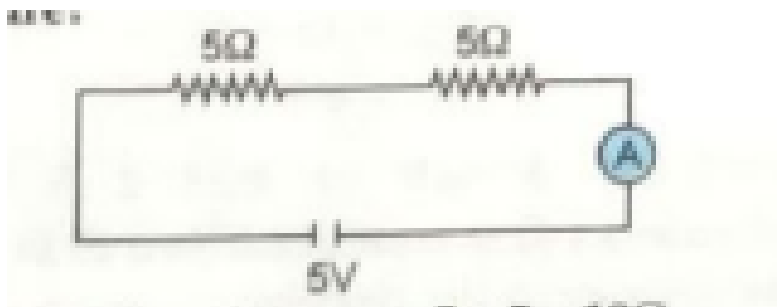
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15. What is the current flowing in the resistor shown in the given figure?



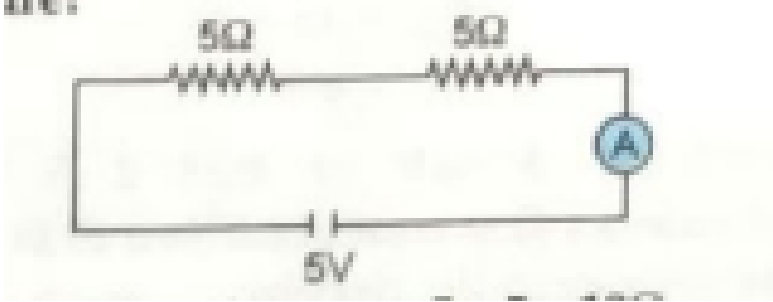
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16. What is the reading in ammeter in the given figure?



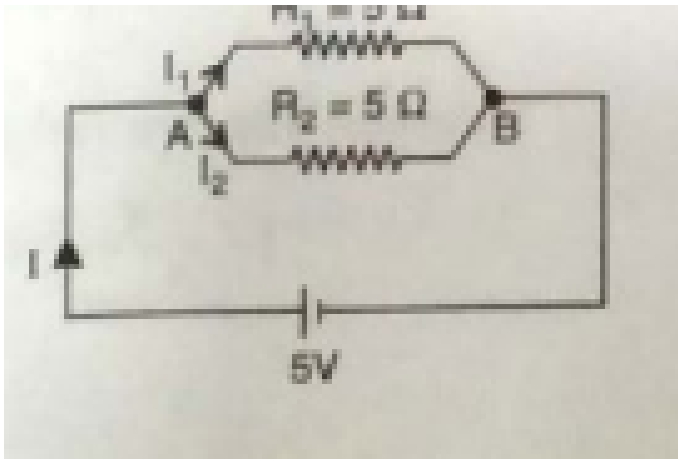
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17. What is the reading in ammeter in the given figure?



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18. Find the current through R_1 and R_2 . Also, find the total current drawn from the battery.

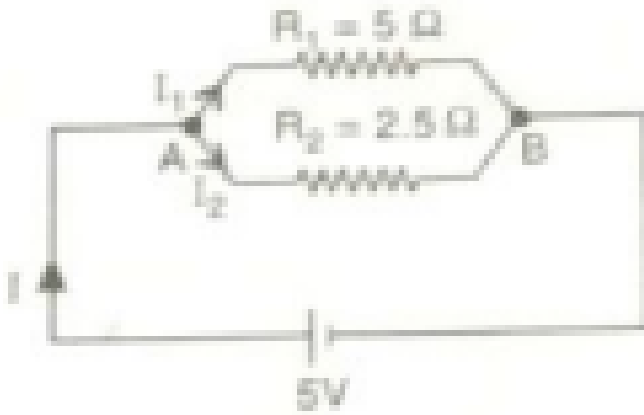






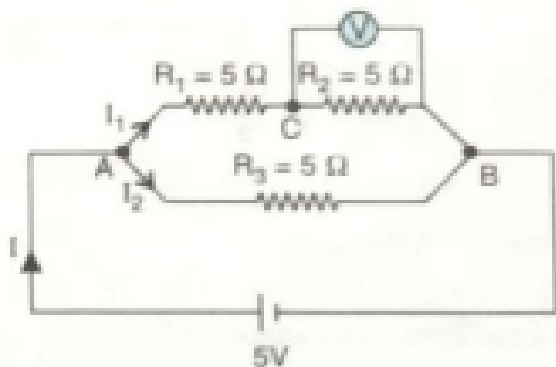
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19. Find I_1, I_2 and I in the given is 5V.



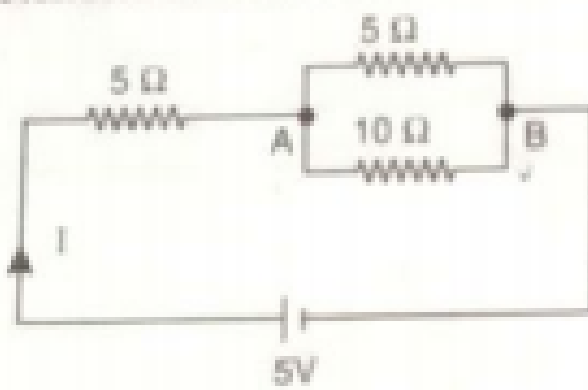
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20. Find I_1 , I_2 and the reading of voltmeter in the given figure.



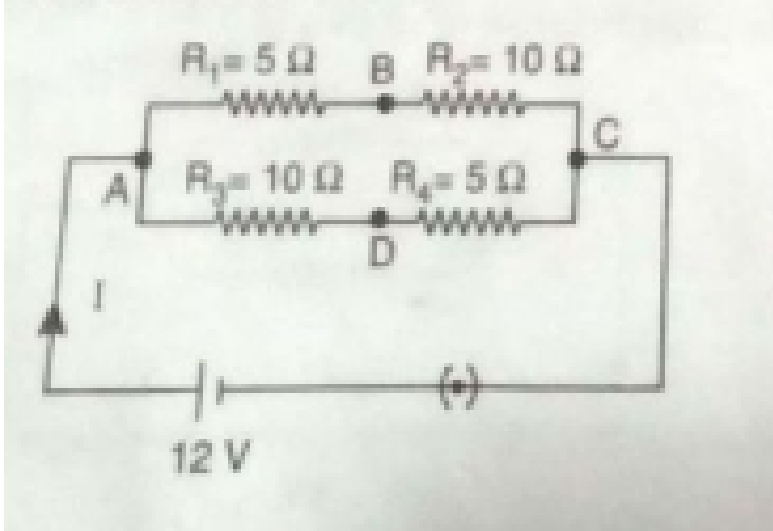
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21. Find the current drawn by the battery and the potential difference between A and B.



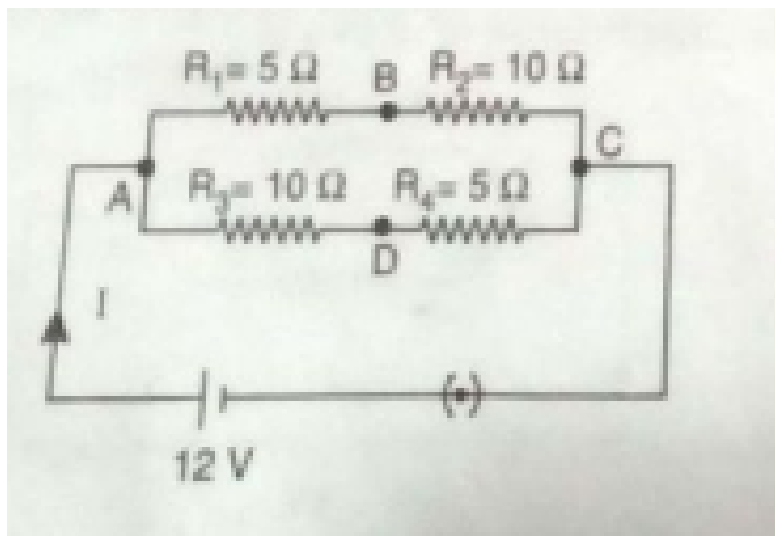
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22. Find the total current drawn from the battery.



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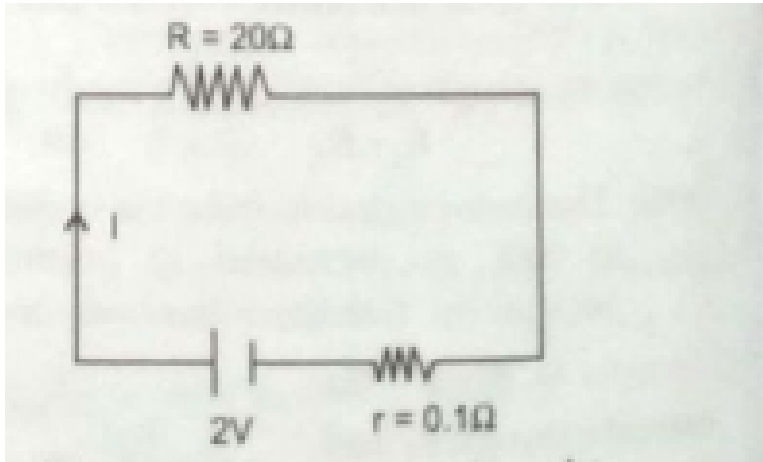
23. Find potential difference between B and C.



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24. A cell of emf 2 V and internal resistance $0.1\ \Omega$ is connected to a $20\ \Omega$ resistor

.What is the current in the circuit ?

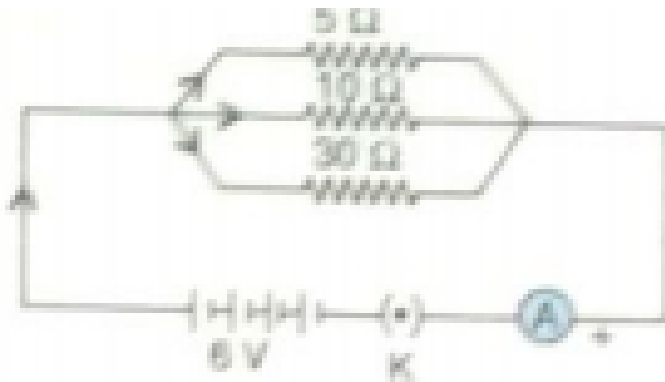


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25. For the circuit shown in the diagram:

Calculate

the value of current through each resistor.

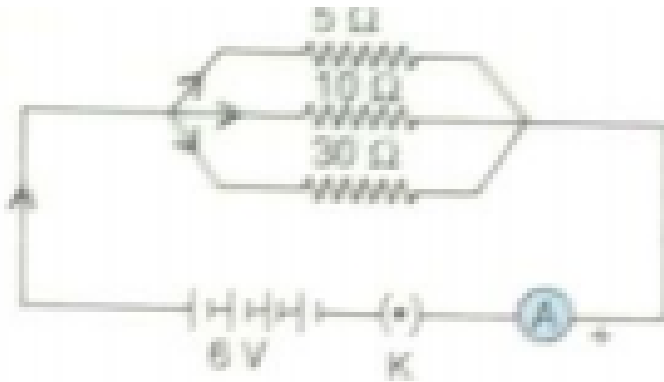


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26. For the circuit shown in the diagram:

Calculate the

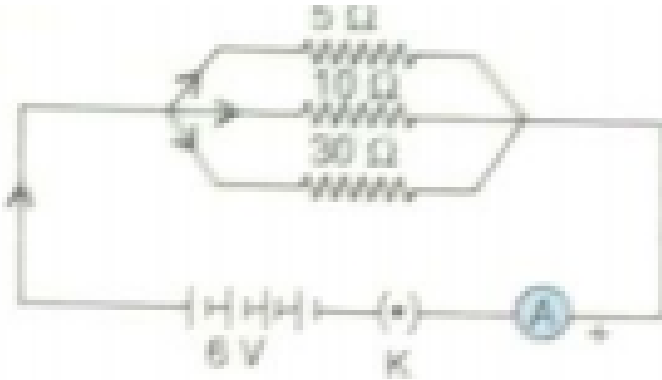
total current in the circuit.



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27. For the circuit shown in the diagram:
Calculate the total effective resistance of the

circuit.

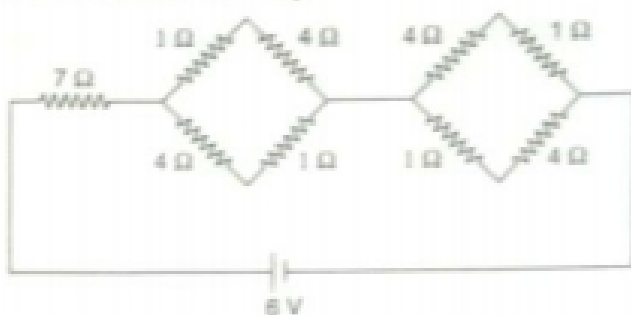


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28. The resistance of an electric heater is 25Ω . Its ends are connected to the poles of a $90V$ dry battery. How much current will flow in the heater wire?

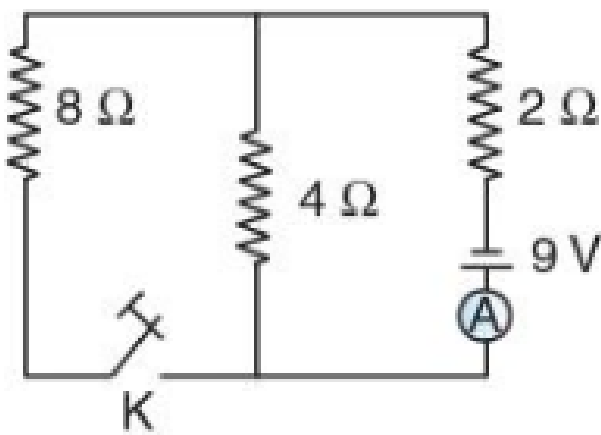
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29. In the given circuit, find the current drawn from the battery.



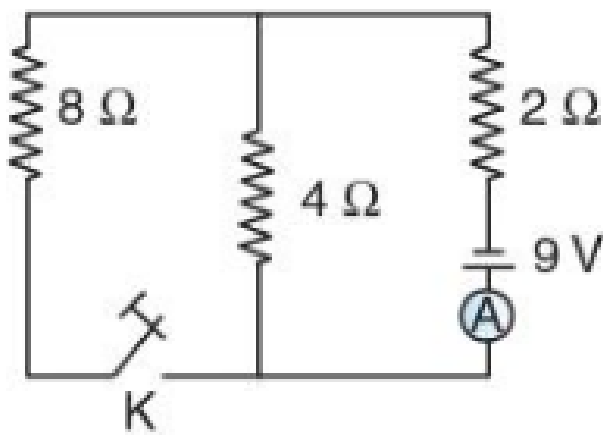
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30. What is the reading of ammeter in the given circuit when the key K is on.'



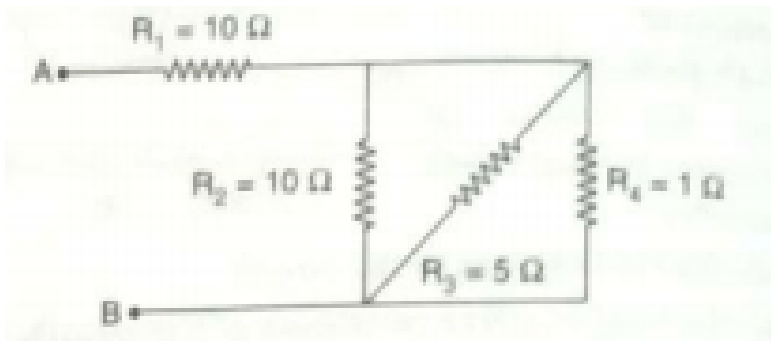
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31. What is the reading of ammeter in the given circuit when the key K is of off..`



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32. Find the equivalent resistance between point A and B in the circuit.





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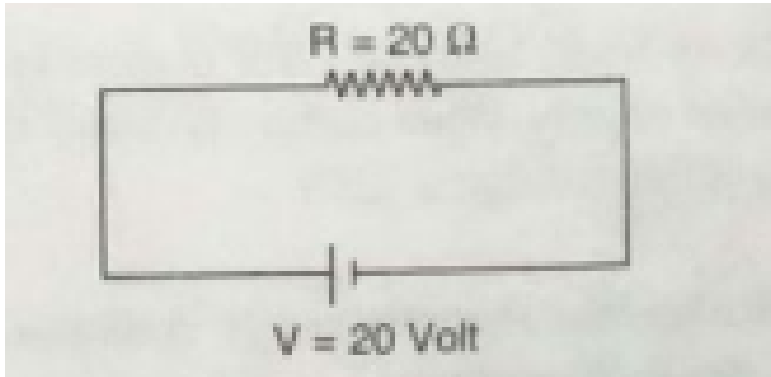
33. A current of 1 A is passed through a resistor of resistance 20Ω for 1 minute. Find the heat produced in the resistor.



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34. A resistor of resistance 20Ω is connected across a potential difference of 20 V for one minute. Calculate the heat produced

in the resistor.



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35. Calculate the resistance of a bulb rated 100 W, 220V. What is the current flowing in the bulb when connected across a potential difference of 220 V?



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36. A current of 0.45 A flowing in a resistor dissipate 100 J of energy in one second. Calculate the resistance of resistor.



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37. An electrical appliance of 1000 W is used 6 hours/day. What is the electricity bill of the appliance in one day if the rate charged by electricity board is Rs.4/unit?

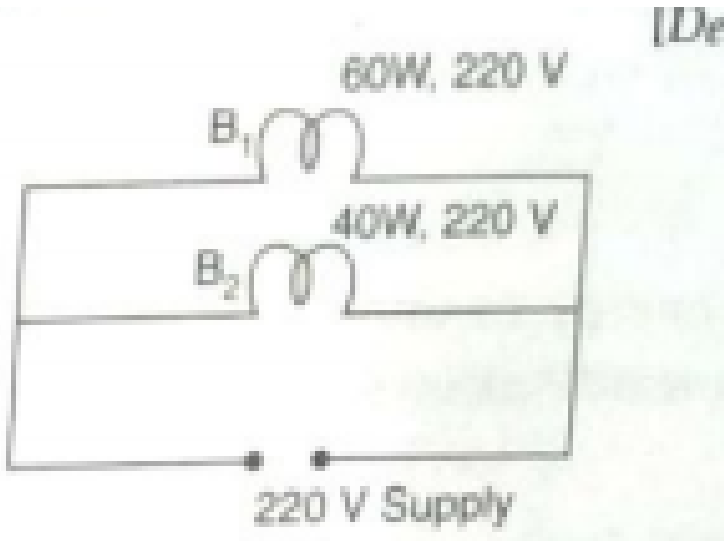


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38. Two lamps, one rated 60 W at 220V and the other 40 W at 220 V are connected in parallel to the electric supply at 220V.

Calculate the total energy consumed by the two lamps together when they operate for

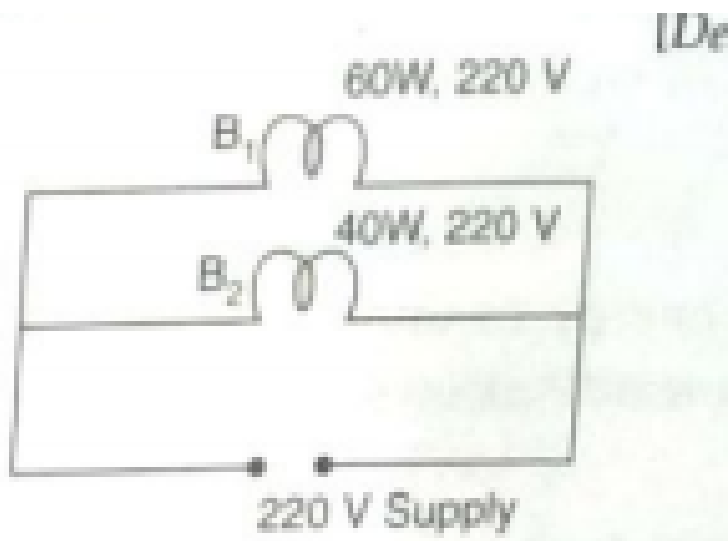
one hour.



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39. Two lamps, one rated 60 W at 220V and the other 40 W at 220 V are connected in parallel to the electric supply at 220V.

Calculate the current drawn from the electric supply.

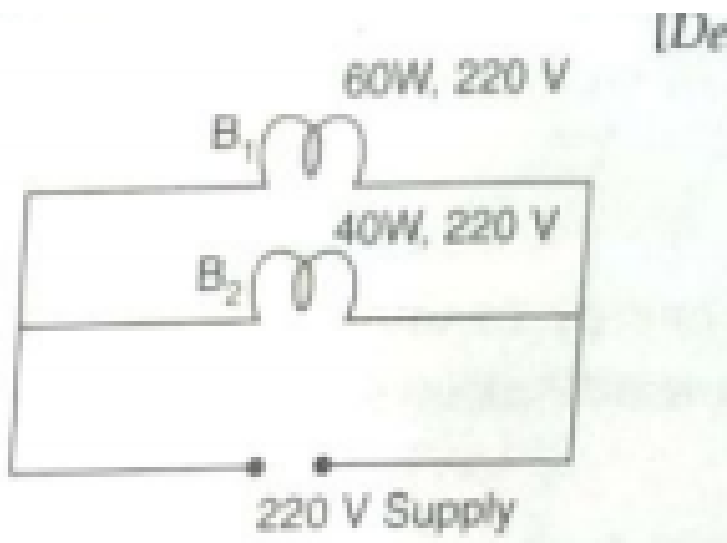


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40. Two lamps, one rated 60 W at 220V and the other 40 W at 220 V are connected in

parallel to the electric supply at 220V.

Calculate the total energy consumed by the two lamps together when they operate for one hour.



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41. An electric fuse of rating 3A is connected in a circuit in which electric iron of power 1 kW is connected which operates at 220V. What would happen?



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42. What is an electric circuit?



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43. SI unit of current is:



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44. Calculate the number of electrons that constitute 1 coulomb of charge.



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45. Name a device that help to maintain a potential difference across a conductor?



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



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



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48. On what factors does resistance depends?

Explain.



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49. Will the 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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50. Let the resistance of an electrical component remains constant while the potential difference across the two ends of the component decreases to half of its former value. What change will occur in the current through it?



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51. Why are coils of electric toasters and electric irons made of an alloy rather than that

of a pure metal?



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52. Which among iron and mercury is a better conductor?



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53. Which material is best conductor?



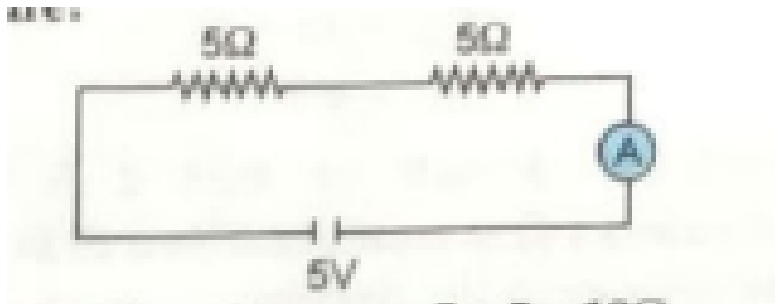
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54. Draw schematic diagram of a circuit consisting of a battery of three cells of 2 V each a 5Ω resistor: an 8Ω resistor and 12Ω resistor and a plug key, all connected in series?



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55. What is the reading in ammeter in the given figure?





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56. Judge the equivalent resistance when the following are connected in parallel

1ohm and 10^4ohm



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57. Judge the equivalent resistance when the following are connected in parallel: 1Ω and

$10^6\Omega$



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



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59. What are the advantages of connecting electric devices in parallel with the battery instead of connecting them in series?



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60. How can three resistors of resistance $2\ \Omega$, $3\ \Omega$ and $6\ \Omega$ be connected to give a total resistance of (a) $4\ \Omega$ (b) $1\ \Omega$?



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61. How can three resistors of resistance $2\ \Omega$, $3\ \Omega$ and $6\ \Omega$ be connected to give a total resistance of (a) $4\ \Omega$ (b) $1\ \Omega$?



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62. What is the (a) highest :(b) lowest total resistance that can be secured by combination of four coils of resistances $4\ \Omega$, $8\ \Omega$, $12\ \Omega$, $24\ \Omega$?



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63. What is the (a) highest :(b) lowest total resistance that can be secured by combination of four coils of resistances 4Ω 8Ω 12Ω 24Ω ?



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



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65. Compute the heat generated while transferring 96,000 C of charge in one hour through a potential difference of 50 V.



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



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



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68. An electric motor takes 5A from a 220 V line. Determine the power of the motor and the energy consumed in 2 hours



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69. 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

A. $1/25$

B. $1/5$

C. 5

D. 25

Answer:



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70. Which of the following terms does not represent electrical power in a circuit?

A. $I^2 R$

B. IR^2

C. VI

D. $\frac{V^2}{R}$

Answer:



71. An electric bulb is rated 220 V and 100 W. when it is operated on 110 V, the power consumed will be

A. 100 W

B. 75 W

C. 50 W

D. 75 W

Answer:



72. 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 heat produced in series and parallel combination would be (a) 1:2 (b) 2:1 (c) 1:4 (d) 4:1

A. 1 : 2

B. 2 : 1

C. 1 : 4

D. 4: 1

Answer:



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



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74. A copper wire has diameter 0.5 mm, and resistivity of $1.6 \times 10^{-8} \text{ ohm} - \text{m}$. What will be the length of this make its resistance 10 ohm ? How much does the resistance change if the diameter is doubled.



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75. The values of current I flowing in a given resistor of the corresponding values of potential difference V across the resistor are

given below:

I(amperes)	0.5	1.0	2.0	3.0	4.0
V(volts)	1.6	3.4	6.7	10.2	13.2

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



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



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77. A battery 9 V is connected in series with resistors of 0.2Ω , 0.3Ω , 0.4Ω , 0.5Ω and 12Ω respectively. How much current will flow through a 12Ω resistor?



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78. How many 176Ω resistors in parallel are required to carry 5A on a 220 V line?



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79. How will you connect three resistors, each of resistance $6\ \Omega$, so that the combination has a resistance of (i) $9\ \Omega$,(ii) $4\ \Omega$



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80. How will you connect three resistors, each of resistance $6\ \Omega$, so that the combination has a resistance of (i) $9\ \Omega$,(ii) $4\ \Omega$



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



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82. A hot plate of an electric oven connected to a 220 V line has two resistance coils A and B, each of 24Ω resistance, which may be used

separately, in series or in parallel what are current in three cases?



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83. Compare the power used in the 2ohm resistor in each of the following circuits
a 6V battery in series with 1Ω and 2Ω resistors?



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84. Compare the power used in $2\ \Omega$ resistor in each of the following circuits: a $4\ \text{V}$ battery in parallel with $12\ \Omega$ and $2\ \Omega$ resistors.



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



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86. Which uses more energy, a 250 W TV set for 1 hour or a 1,200 W toaster for 10 minutes?



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



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88. Explain the following : Why is the tungsten used almost exclusively for filament of electric lamps?



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89. Explain the following: Why are the conductors of electric heating devices, such as bread toasters and electric irons, made of an alloy rather than pure metal?



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90. Explain the following : Why is the series arrangement not used in domestic circuits?



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91. Explain the following: How does the resistance of a wire vary with its area of cross-section?



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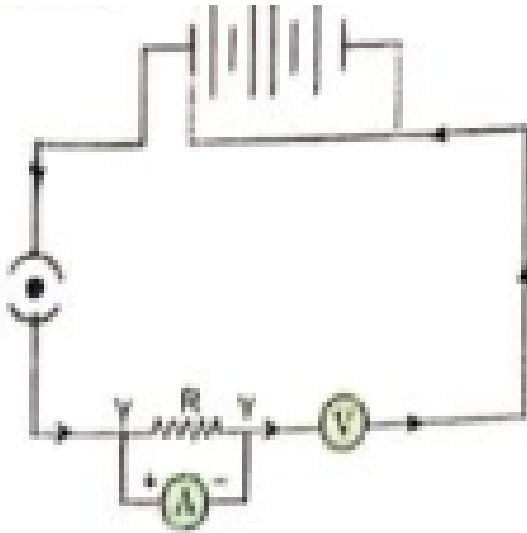
92. Explain the following : Why are copper and aluminium usually employed for electricity transmission?



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93. A child has drawn the electric circuit to study Ohm's law as shown in figure. His teacher told that the circuit diagram needs correction. Study the circuit diagram and

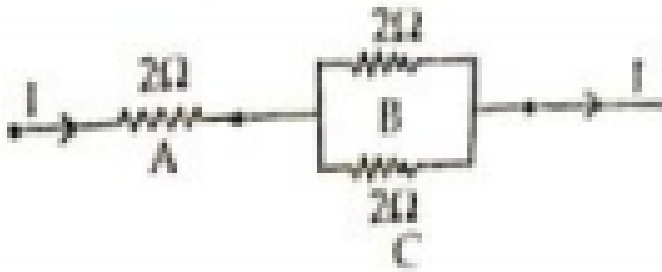
redrw it after making all corrections.



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94. Three 20Ω resistance A, B and C are connected as shown in figure. Each of them disipates energy and can withstand a

maximum power of 18W without melting. Find the maximum current that can flow through the three resistors.



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95. Explain why the resistance of ammeter is kept low.

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96. Draw a circuit diagram of an electric circuit containing a cell, a key, an ammeter, a resistor of 2 ohms in series with a combination of two resistors (4 ohms each) in parallel and a voltmeter across the parallel combination. Will the potential difference across the 2 ohms resistor be the same as that across the parallel combination of 4 ohms resistors? Give reasons.



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97. How does the use of fuse wire save the electrical appliances?



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98. What is electrical resistivity? In a series electrical circuit comprising of a resistor having a metallic wire, the ammeter reads 5 A. The reading of the ammeter decreases to half when the length of the wire is doubled. Why?



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99. What is the commercial unit of electrical energy? Represent it in terms of joules.



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100. A current of 1 ampere flows in series circuit contains an electric lamp and a conductor of 5 ohm when connected to a 10V battery. Calculate the resistance of the electric lamp. Now if a resistance of 10 ohm is connected in parallel with this series

combination, what change in current flowing through 5 ohm conductor and potential difference across the lamp will take place? Give reason.



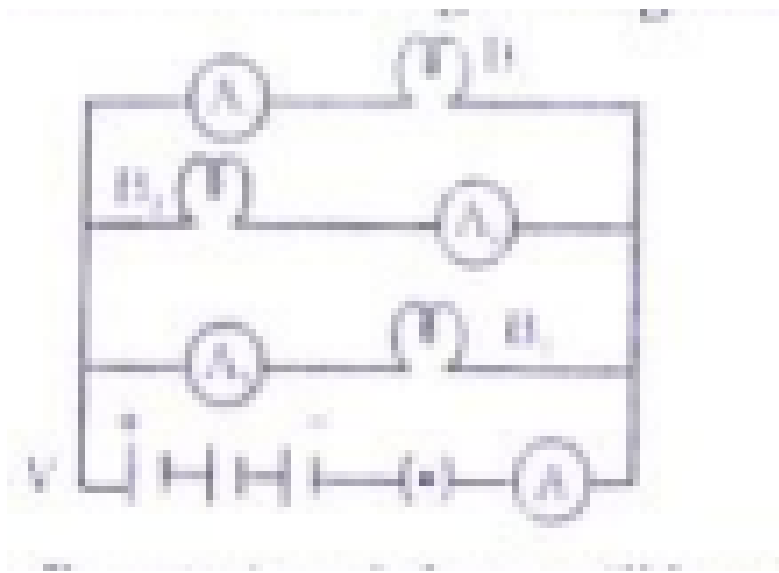
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101. Explain the following : Why is the series arrangement not used in domestic circuits?



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102. B_1 , B_2 and B_3 are three identical bulbs connected as shown in figure. When all the three bulbs glow, a current of 3A is recorded by the ammeter A.

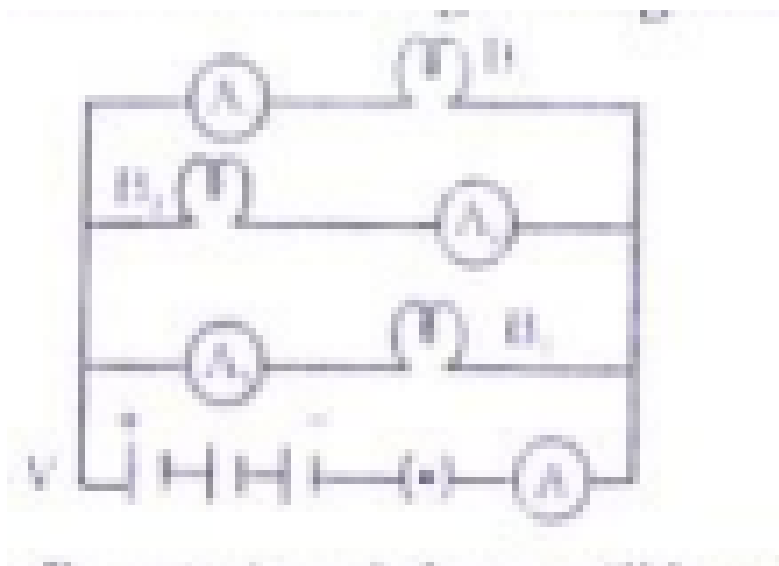


What happens to the glow of the other two bulbs when the bulb B_1 gets fused?



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103. B_1 , B_2 and B_3 are three identical bulbs connected as shown in figure. When all the three bulbs glow, a current of 3A is recorded by the ammeter A.

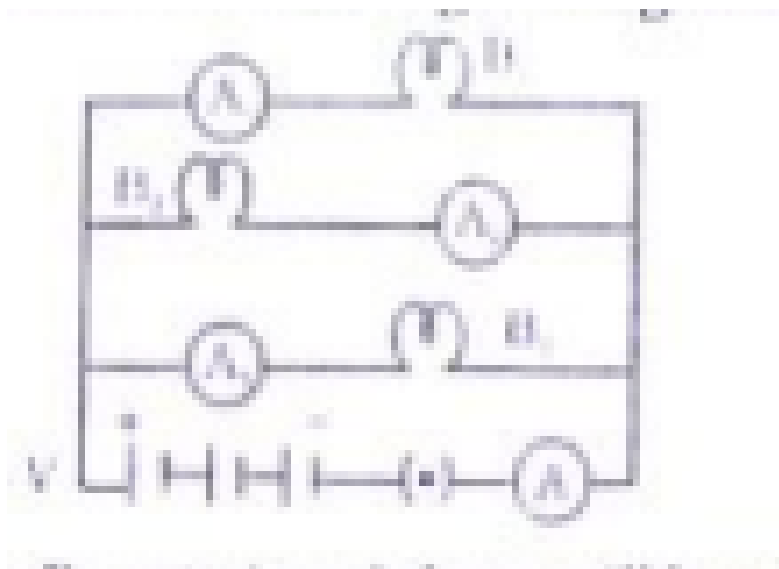


What happens to the reading of A_1 , A_2 , A_3 and A when the bulb B_2 gets fused?



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104. B_1 , B_2 and B_3 are three identical bulbs connected as shown in figure. When all the three bulbs glow, a current of 3A is recorded by the ammeter A.



How much power is dissipated in the circuit when all the three bulbs glow together?



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105. Three incandescent bulbs of 100 W each are connected in series in an electric circuit. In another set of three bulbs of the same wattage are connected in parallel to the source.

Will the bulb in the two circuits glow with the same brightness? Justify your answer.



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106. Three incandescent bulbs of 100 W each are connected in series in an electric circuit. In another set of three bulbs of the same wattage are connected in parallel to the source.

Now, let one bulb in both the circuits get fused. Will the rest of the bulbs continue to glow in each circuit? Give reason.



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107. What is ohm's law? How can it be verified?



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108. What is electrical resistivity of a material?

What is its unit?



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109. How will you infer with the help of an experiment that the same current flows

through very part of the circuit containing three resistance in series connected to a battery?



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110. How will you conclude that the same potential difference voltage exists across three resistors connected in a parallel arrangements to a battery?



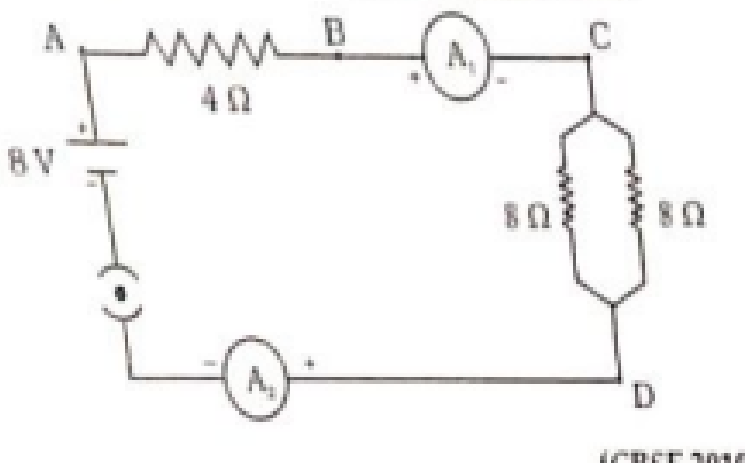
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111. What is the joule's heating effect? How can it be demonstrated experimentally? List its four appliances in daily life.



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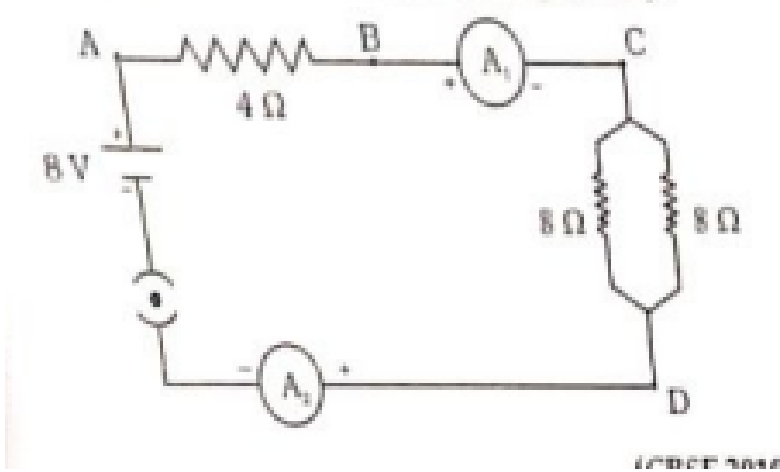
112. Find out the following in the electric circuit given in figure.



Effective resistance of two $80hm$ resistors in the combination?

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113. Find out the following in the electric circuit given in figure.

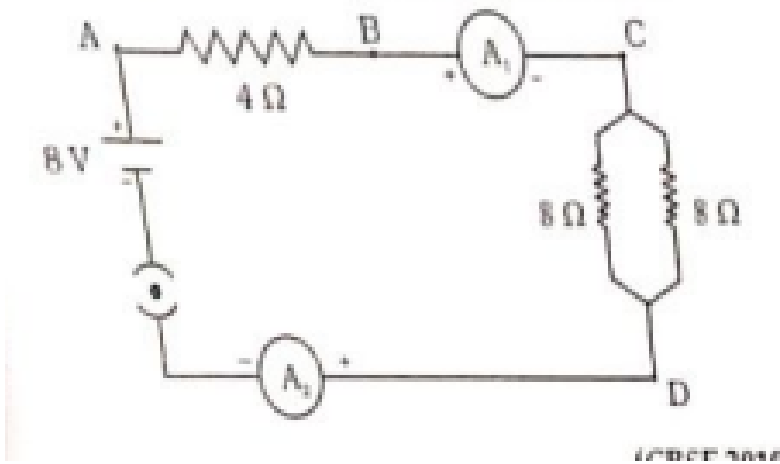


Current flowing through 4Ω resistors?



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114. Find out the following in the electric circuit given in figure.

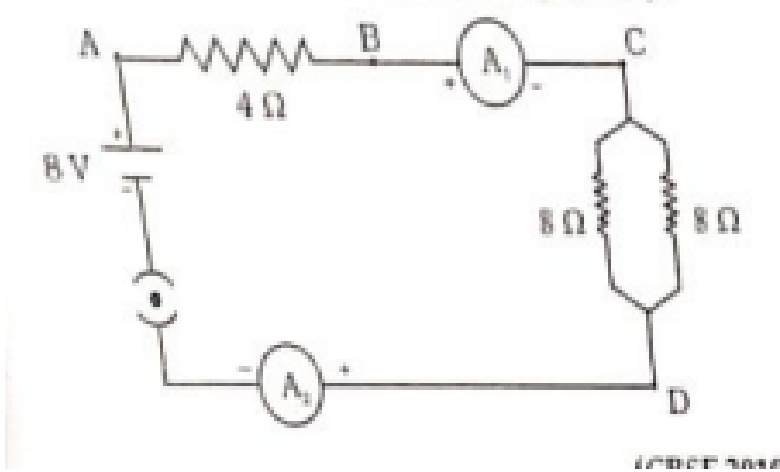


Potential difference across 4ohm resistance.



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115. Find out the following in the electric circuit given in figure.

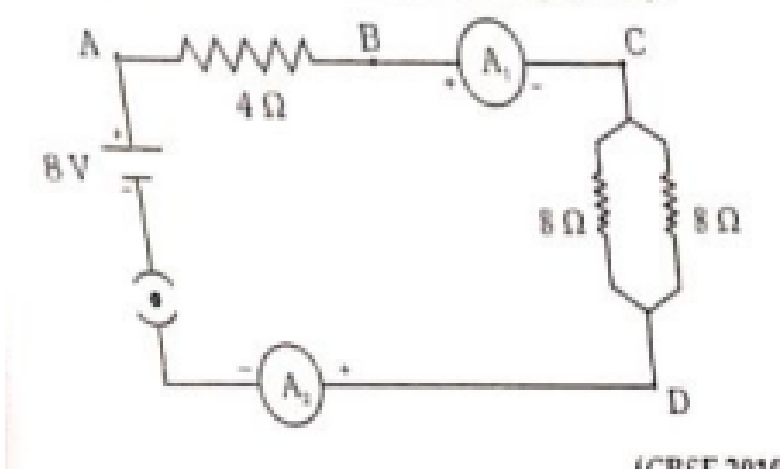


Power dissipated in 4Ω resistor.



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116. Find out the following in the electric circuit given in figure.



Difference in ammeter readings if any.



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117. In a circuit two resistors 5ohm and 10ohm are connected in series. How can the current passing through the two resistors can be compared?



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118. Two wires of equal length, one of copper and the other of manganin have the same thickness. Which one will be used for its electrical transmission lines?



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119. Two wires of equal length, one of copper and the other of manganin have the same

thickness. Which one will be used for its electrical heating devices? Why?



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120. Two metallic wires A and B of same material are connected in parallel. Wire A has length l and radius r and wire B has length $2l$. Calculate the ratio of the total resistance of parallel combination and the resistance of wire A?

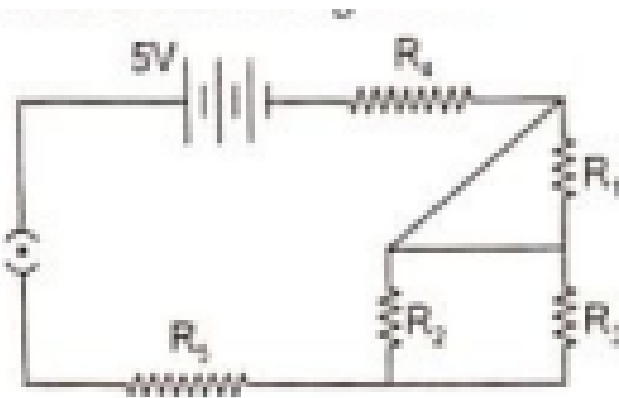


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121. How is the direction of current related to the direction of flow of electron in a wire?

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122. Consider the following circuit:

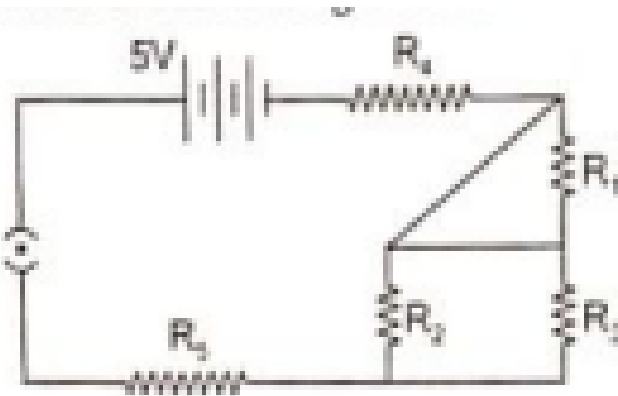


$$R_1 = R_2 = R_3 = R_4 = R_5 = 2\text{ohm}$$

Which two resistors are connected in series?

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123. Consider the following circuit:



$$R_1 = R_2 = R_3 = R_4 = R_5 = 2\text{ohm}$$

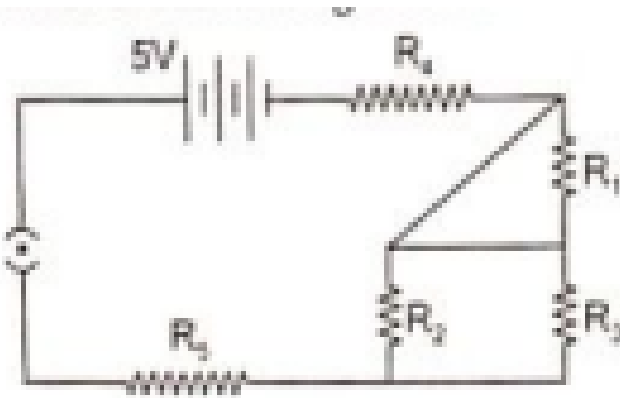
Which two resistors are connected in parallel?





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124. Consider the following circuit:



$$R_1 = R_2 = R_3 = R_4 = R_5 = 2\text{ohm}$$

What current will flow in the circuit?



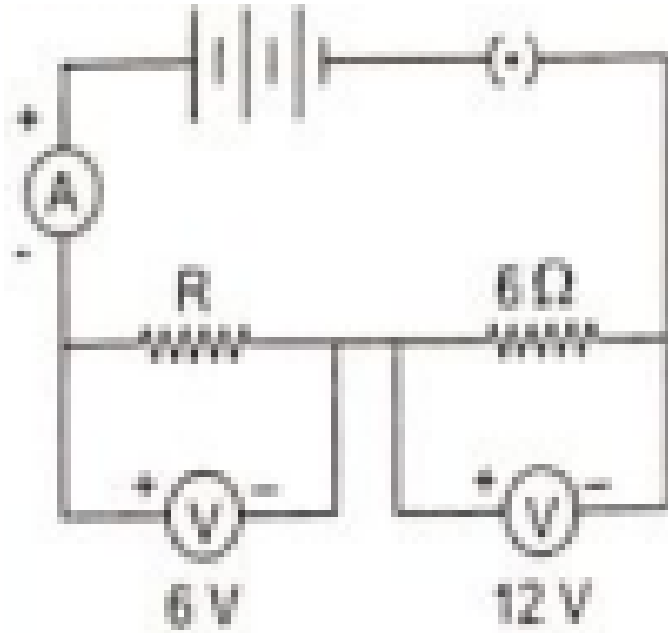
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125. Derive the expression for the heat produced due to a current ' I ' flowing for a time interval ' t ' through a resistor ' R ' having a potential difference ' V ' across its ends. With which name is this relation known ?



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126. A circuit is shown in the diagram

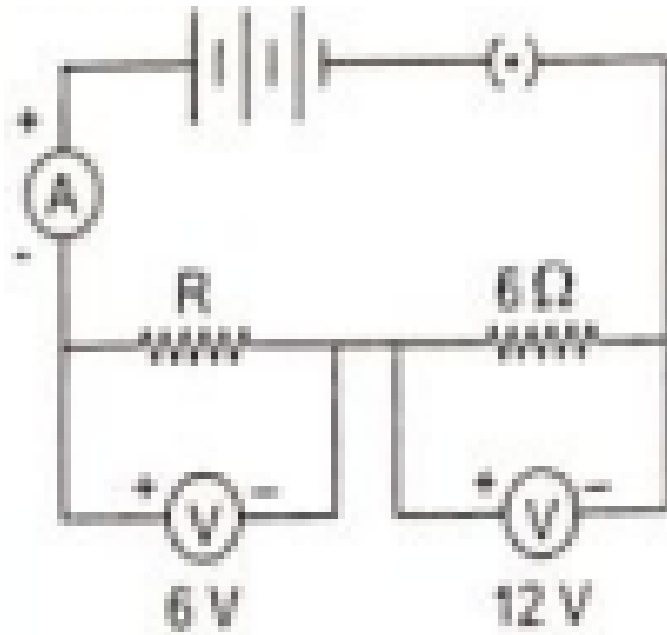


Find the value of R .



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127. A circuit is shown in the diagram

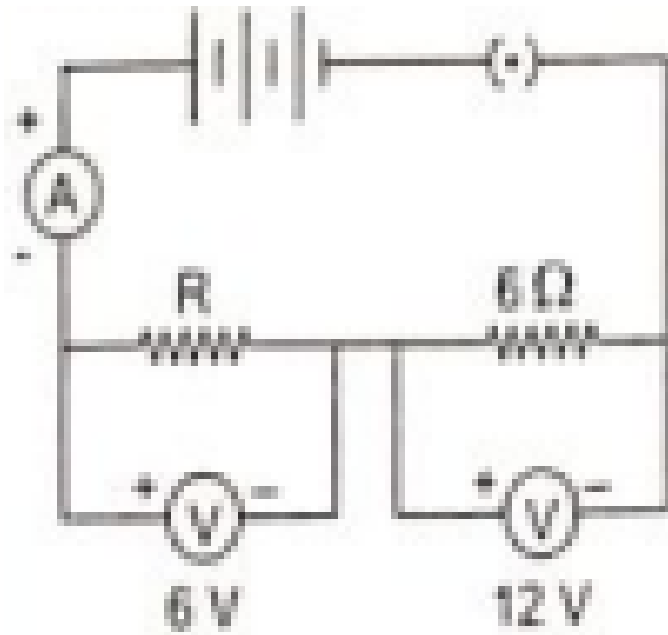


Find the reading of ammeter?



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128. A circuit is shown in the diagram

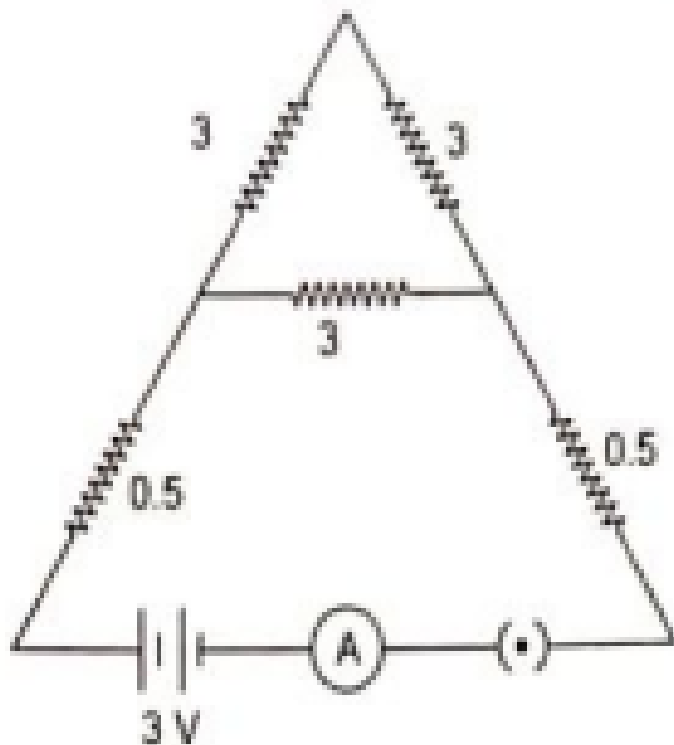


Find the potential difference across the terminals of the battery.



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129. Five resistors are connected in a circuit as shown, find the ammeter reading when the circuit is closed.



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130. Name the physical quantity which is same

different in all bulbs when three bulbs are of same wattage are connected on series.



Watch Video Solution

131. Name the physical quantity which is same

different in all bulbs when three bulbs are of same wattage are connected in parallel.



Watch Video Solution

132. Name the physical quantity which is same

different in all bulbs when three bulbs are of different wattage are connected in series.



Watch Video Solution

133. Name the physical quantity which is same

different in all bulbs when three bulbs are of different wattage are connected in parallel.



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134. Two identical wires one of Nichrome and other copper are connected in series and a current I is passed through them. State the change observed in the temperature of the 2 wires .Justify your answer .State the law which explains the above observation.



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135. An electric bulb is rated 60W, 240V. Calculate its resistance. If the volatage drops to 192v, calculate the power consumed and the current drawn by the bulb.[Assume the resistance of the bulb remians unchanged].



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136. A wire has a resistance of 16 ohm it is melted and drawn into a wire of half its length

calculate the resistance of new wire what is the percentage change in its resistance



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137. Three identical resistors are first connected in series and then in parallel find the ratio of the equivalent resistance in two cases



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138. A fuse wire melts at 5A. If it is desired that the fuse wire of the same material melt at 10A, then should the new fuse wire be of smaller or larger radius than the earlier one? Give reasons for your answer.



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139. Why do we use copper and aluminium wire for transmission of electrical current? Why not iron?





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140. A piece of wire having resistance R is cut into five equal parts.

How does the resistance of each part of the wire compare with the original resistance?



[Watch Video Solution](#)

141. A piece of wire having resistance R is cut into five equal parts.

If the five parts of the wire are placed in

parallel, how will the resistance of the combination compare with the resistance of original wire?



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142. How much current will be drawn by an electric iron from a 220 V source if the resistance of its element when hot is $55\ \Omega$? Calculate the wattage of electric iron when it operates on 220V?



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143. In an electric field the work done in bringing a 2 coulomb charge from infinity to a point A is 10 joules and in bringing the same charge to some other point B is 20 joules find the potential difference between two points A and B what would be the work done if the same charge is brought directly from A to B.



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144. Write in the form of a formula a relationship between resistance and resistivity of an ohmic conductor. A wire of length 'l' and resistance 'R' is stretched so that its length is doubled and area of cross section is halved. How will its resistance change?



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145. Write in the form of a formula a relationship between resistance and resistivity of an ohmic conductor. A wire of length 'l' and resistance 'R' is stretched so that its length is doubled and area of cross section is halved. How will its resistivity change . Justify your answer in each case.



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146. Which has more resistivity, a thick or thin wire of the same material?



Watch Video Solution

147. Why should an electrician use gloves while repairing an electric switch at your home ?
Explain.



Watch Video Solution

148. What is the difference between a fuse wire and a heating wire?



Watch Video Solution

149. The heating elements of a heater becomes red hot but not the connecting wire. Why?



Watch Video Solution

150. What is the meant by quantisation of electric charge?



Watch Video Solution

151. Does mass of a body change on charging?



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152. On a rainy evening storm grew loud and apace and dazzling streaks of light seen in the

dark sky. Ananya was driving her car. At a turn, she saw a girl standing under a tree, trying to save herself from the rain. She stopped her car and called the girl to sit in the car. the girl who was desperately looking for help took her assistance. Ananya left the girl at her residence and during thier journey she explained the girl how lightning occurs and standing under a wet tree is very risky whereas sititng in a car is safe.



Lightning and thunder

What according to you are the moral values displayed by Ananya?



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153. On a rainy evening storm grew loud and apace and dazzling streaks of light seen in the dark sky. Ananya was driving her car. At a turn, she saw a girl standing under a tree, trying to save herself from the rain. She stopped her car and called the girl to sit in the car. the girl who was desperately looking for help took her assistance. Ananya left the girl at her residence and during their journey she explained the girl how lightning occurs and standing under a wet tree is very risky whereas sitting in a car is safe.



Lightning and thunder

Why is it not safe to stand under a tree on a rainy day?



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154. On a rainy evening storm grew loud and apace and dazzling streaks of light seen in the dark sky. Ananya was driving her car. At a turn, she saw a girl standing under a tree, trying to save herself from the rain. She stopped her car and called the girl to sit in the car. the girl who was desperately looking for help took her assistance. Ananya left the girl at her residence and during their journey she explained the girl how lightning occurs and standing under a wet tree is very risky whereas sitting in a car is safe.



Lightning and thunder

Why is it not safe to stand under a tree on a rainy day?



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155. Rahul left his car's headlights on while parking. when the returned back after office hours, he found that his car was not starting. His friend Sarthik, who used to share the car him for coming to office, brought a mechanic who found that as the headlights were left open, the car's battery got exhausted. The mechanic brought another battery and connected its terminals with the battery of hte car. this is how he started the car and told Rahul not to shut off the engine at least 15 minutes.

what happens if the headlight remains on for a few hours while the car is not running?



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What happens if the headlight remains on for a few hours while the car is not running?



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Exercise

1. Define electric current and give its unit



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2. Define

one volt?



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3. Define electric current and give its unit



[Watch Video Solution](#)

4. Define

one ampere?



[Watch Video Solution](#)

5. What is a electric circuit?



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6. What is the difference between a voltmeter and an ammeter?



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7. 2 ampere of current is flowing through a wire. What is the amount of charge passing through it in 1 min ? Also find the number of electrons passed through a cross-section of wire in this time.





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8. Find the electric potential of a point if 2J of work is done in bringing a charge of 0.2C from infinity to that point.



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9. Find the potential difference between two points if 5J of work is done in moving a charge of 2mC from one point to another.



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10. How many electrons should be removed from a conductor so that it acquires a positive charge of $3.5 \times 10^{-9} \text{C}$.



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11. An electric bulb draws a current of 0.5A for 10 minutes. Calculate the amount of electric charge that flows through the circuit.



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12. Draw the following electrical symbols:

Battery



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13. Draw the following electrical symbols:

plug key(closed)



Watch Video Solution

14. Draw the following electrical symbols:

variable resistance



Watch Video Solution

15. Draw the following electrical symbols:

Electric bulb?



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16. Write ohm's law. Draw a circuit diagram to prove it experimentally in the laboratory?



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17. On what factors does resistance depends?

Explain.



Watch Video Solution

18. For three resistors connected in parallel, prove that the equivalent resistance is equal to the sum of the individual resistance

$$R_p \text{ is given by } \frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$



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19. Find the equivalent resistance of three resistors of 2Ohm , 3Ohm , 4Ohm when connected in series ?





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20. Find the equivalent resistance of three resistors of 20Ω , 30Ω , 40Ω when connected in parallel?



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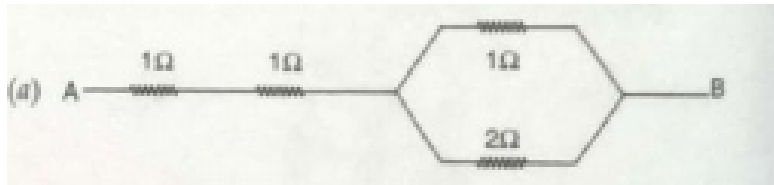
21. A wire of resistance 20Ω is bent in the form of a closed circle. What is the effective

resistance between two points at the ends of any diameter of the circle?



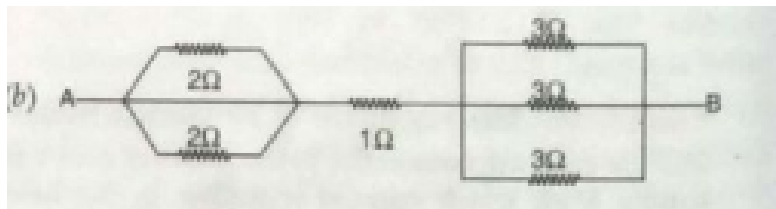
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22. Calculate the effective resistance between A and B



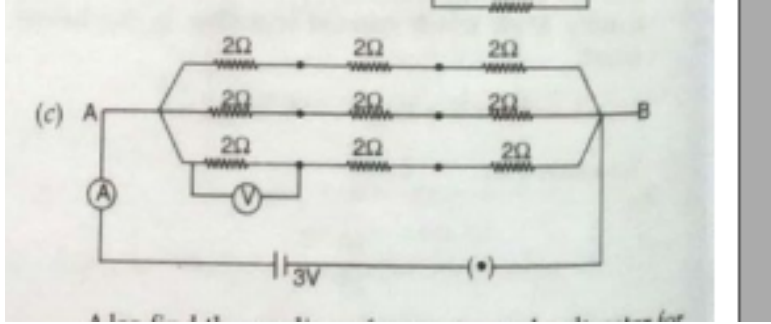
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23. Calculate the effective resistance between A and B



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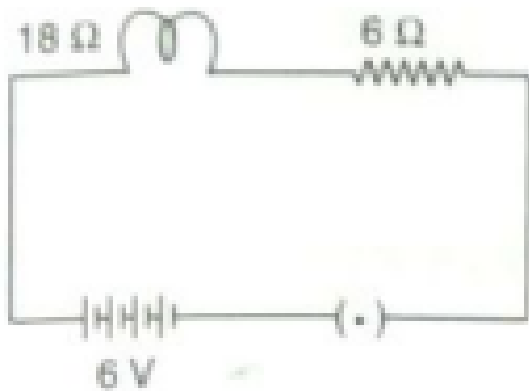
24. Calculate the effective resistance between A and B



Also find the reading of ammeter and voltmeter for part(c).

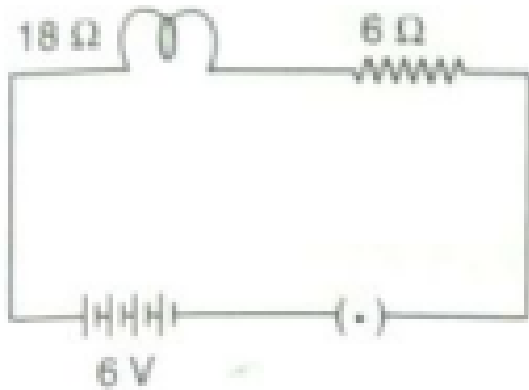
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25. In the given circuit calculate the total resistance of the circuit.



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26. In the given circuit calculate current flowing through the circuit

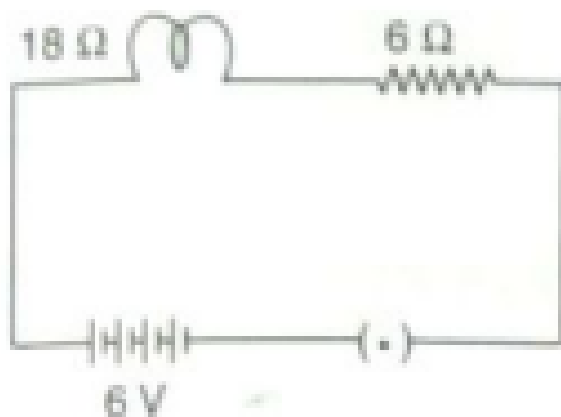




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27. In the given circuit calculate

potential difference across the lamp and resistor.



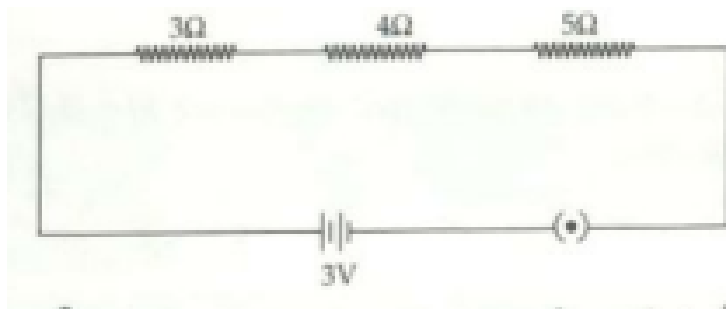
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28. A piece of wire of resistance 20Ω is drawn out so that its length is increased to twice its original length. Calculate the resistance of the wire in its new situation.



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29. Study the following electric circuit and find potential difference across 4Ω resistor





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30. State four different ways in which three resistors of ' r ' ohm each may be connected in a circuit. In which case is the equivalent resistance of the combination maximum



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31. State four different ways in which three resistors of ' r ' ohm each may be connected in a circuit. In which case is the equivalent resistance of the combination minimum



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32. A lamp rated 100 W at 220 V is connected to the mains electric supply. What current is

drawn from the supply line if the voltage is 220V.



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33. Calculate the electric energy consumed by a 1200 W toaster in 20 minutes.



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34. Write the formula for the amount of the heat produced in a resistor when current flows

through it for time. Give three applications of heating effect of current.



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35. Define power. Give its S.I unit and define it.



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36. A current of 5A flows through 12ohm resistor. What is the rate at which heat energy is produced in the resistor.



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37. Name the two type of electric charge.



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38. What is SI unit of electric potential?



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39. What is the name given to flow of electric charge per unit time in a wire?



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40. Name a device used to measure potential difference between two points in a circuit?



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



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



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43. How is ammeter always connected in circuits?



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44. If potential difference across resistor is increased, will the current increase or decrease?



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45. When temperature of metal increases, does the resistance increases or decreases?



Watch Video Solution

46. Which physical quantity has its unit kWh?



Watch Video Solution

47. In a metal wire, electron moves from negative end to positive end and, therefore,

the direction of electric current is from negative to positive.

A. true

B. false

C.

D.

Answer:



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48. For a continuous flow of current through a wire, the potential difference across the wire should be maintained.

A. true

B. false

C.

D.

Answer:



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49. Electrochemical cell is a device which maintains a constant potential difference across its ends. true false



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50.

symbol stands for variable resistor.



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51. The current flows in a metal wire due to movement of electrons, whereas the current

flows in a cell due to movement of ions.



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52. The resistance of copper is more than nichrome.

A. true

B. false

C.

D.

Answer:



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53. The best conductor of electricity is:



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54. Constaitan is used as a standard resistor. Is the statement true or false.



Watch Video Solution

55. Electrical conductance of metals decreases with increase in temperature.



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56. The resistivity of a substance depends on its length and area of cross section. Is the statement true or false.



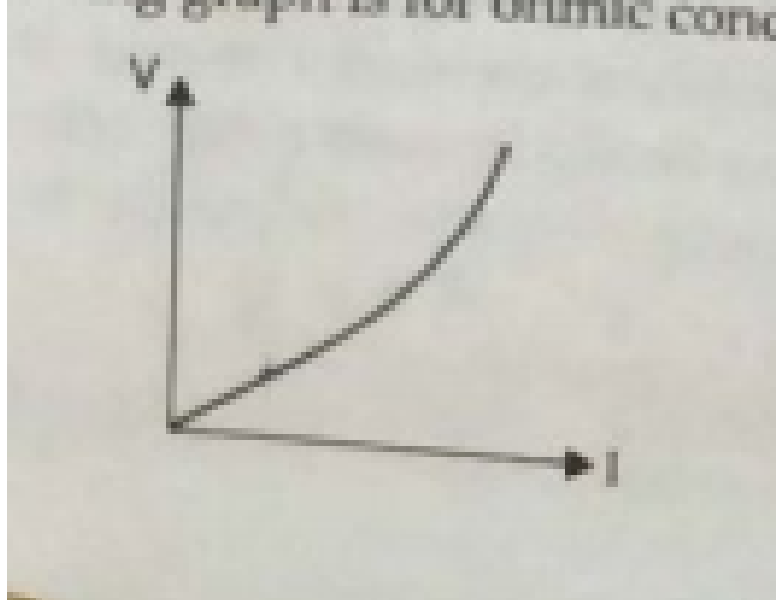
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57. Ohm's law is a universal law. Is this statement true.



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58. The following graph is for ohmic conductor.



.Is this

statement true.



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59. Argon or nitrogen is filled up in place of air in bulb to increase the life of filament of bulb .

Is this statement true.



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60. Show $1 \text{ watt} = (1 \text{ ampere}) \times (1 \text{ volt})$



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61. What is meant by the BOTU (or Board of Trade unit) of electric energy?



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62. From rated value of power and potential difference the resistance of the appliance can be found by the formula $R = \frac{V_{rated}^2}{P_{rated}}$. This resistance does not change if the same appliance is used across different potential difference. But the power of appliance will change. Is this statement true.



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63. Fill ups

Electric potential at a point is thein moving acharge from infinity to that point.



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64. Fill ups

..... $\times V = W$



[Watch Video Solution](#)

65. Fill ups

$$1A \times 1s = \dots\dots\dots$$



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66. Fill ups

$$Q = I \times \dots\dots\dots$$



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67. Fill ups

Electric current through an area is the amount offlowing through it per second.



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68. Fill ups

The current flowing through a conductor is directly proportional to the applied..... across the ends of the conductor. Provided the physical conditions remains the same.





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69. Fill ups

$$V = I \times \dots\dots\dots$$



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70. Fill ups

The S.I unit of resistance is.....and is denoted by..... .



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71. Fill ups

The resistance of a conductor depends on.....and.....



[Watch Video Solution](#)

72. Fill ups

The S.I unit of resistivity is..... .



[Watch Video Solution](#)

73. Fill ups

Electric iron, electric toaster, electric oven, electric kettle, electric heater are based on.....effect of electricity.



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74. Fill ups

If current passes through a resistor is doubled, the rate of consumption of energy by

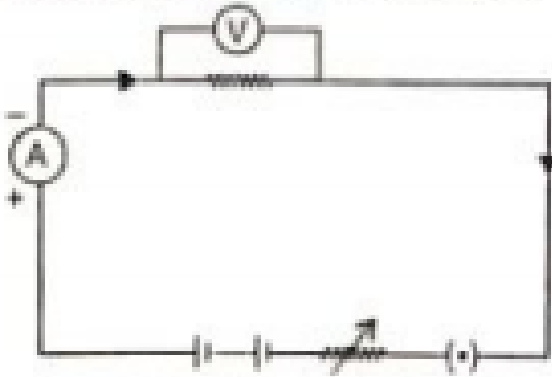
the resistor becomestimes, provided the resistance remains unchanged?



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75. The following circuit diagram shows the experimental set up for the study of dependence of current on potential difference. Which two circuit components are connected

in series?



- A. Battery and voltmeter
- B. Ammeter and voltmeter
- C. Ammeter and rheostate
- D. Resistor and voltmeter

Answer:



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76. In a voltmeter there are 20 divisions between the 0 mark and 0.5 V mark. The least count of the voltmeter is

A. 0.020 V

B. 0.025 V

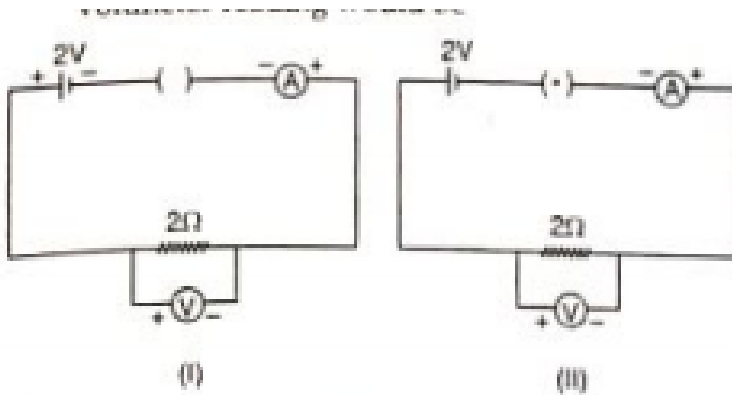
C. 0.050 V

D. 0.250 V

Answer:



77. For the circuits shown in figure I and II the voltmeter reading would be



A. 2V In (I) and 0V in (II)

B. 0V in both

C. 2 v in both

D. 0 V in (I) and 2 V in (II)

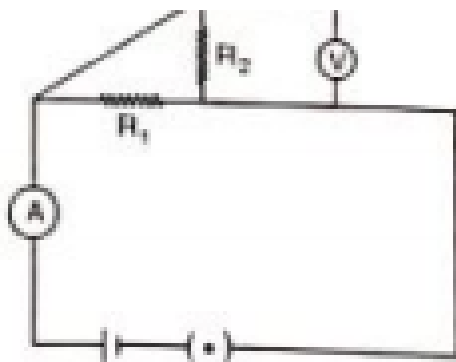
Answer:



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78. Which of the circuit components in the following circuit diagram are connected

in parallel?



(a) R_1 and R_2 only

(b) R_2 and V only

A. R_1 and R_2 only

B. R_2 and V only

C. R_1 and V only

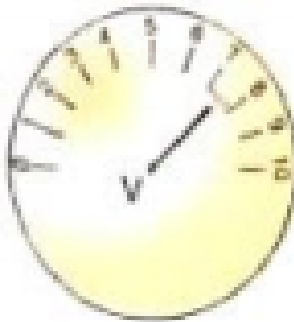
D. R_1 , R_2 and V

Answer:



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79. The current flowing through a conductor and the potential difference across it two ends are as per readings of the ammeter and voltmeter shown below. The resistance of the conductor would be



A. 0.02 ohm

B. 0.024 ohm

C. 20.0 ohm

D. 24.0 ohm

Answer:



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80. The following instruments are available in a laboratory

Miliammeter A_1 of range 0-300 mA and least count 10 mA

Millimeter A_2 of range 0-200 mA and least count 20 mA

Voltmeter V_1 of range 0-5 V and least count 0.2 V

Voltmeter V_2 of range 0-3V and least count 0.3V

Out of which of the following pairs of instruments which pair would be the best choice for carrying out the experiment to determine the equivalent resistance of two resistances connected in series.

A. Milliammeter A_1 and voltmeter V_1 .

B. Milliammeter A_2 and voltmeter V_2 .

C. Milliammeter A_1 and Voltmeter V_2

D. Milimeter A_2 and Voltmeter V_1

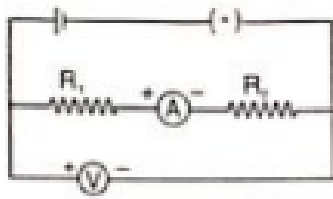
Answer:



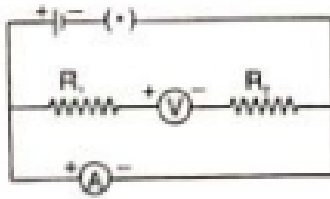
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81. In an experiment to determine equivalent resistance of two resistors R_1 and R_2 in series, which one of the following circuit diagrams shows the correct way of connecting

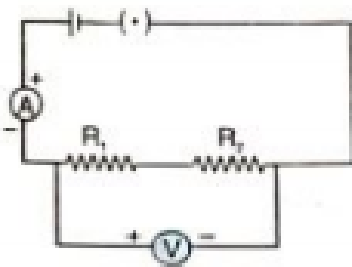
the voltmeter in the circuit?



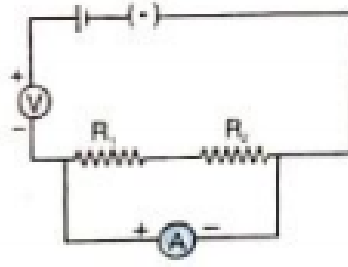
(I)



(II)



(III)



(IV)

A. I

B. II

C. III

D. IV

Answer:

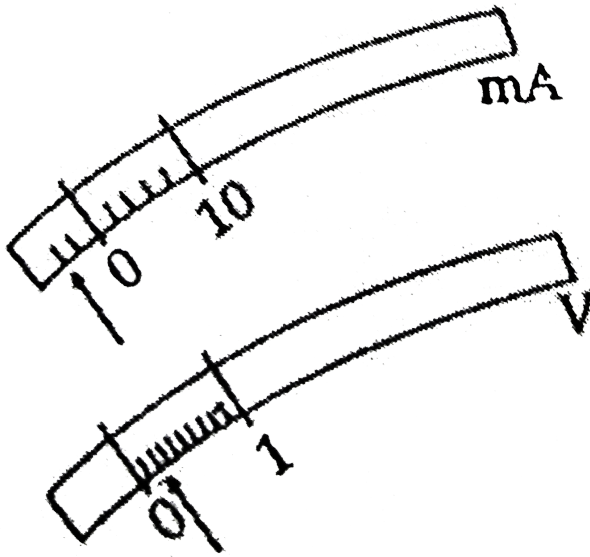


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82. The rest positions of the needles in a milliammeter and voltmeter when not being used in a circuit are shown in the figure. The zero error and least count of these two

instruments

are



A. (+4mA, -0.2V) and (1mA, 0.1V) respectively

B. (+4mA, -0.2V) and (2mA, 0.2V) respectively

C. (-4mA, +0.2V) and (2mA, 0.2V)

respectively

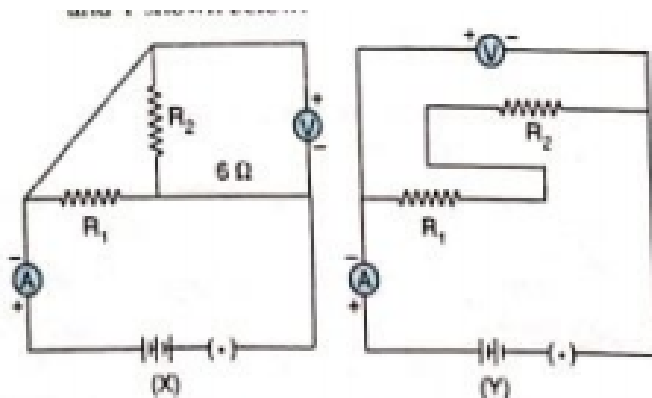
D. (-4mA, +0.2V) and (2mA, 0.1V) respectively

Answer:



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83. The only correct statement for the two circuits X and Y shown below:



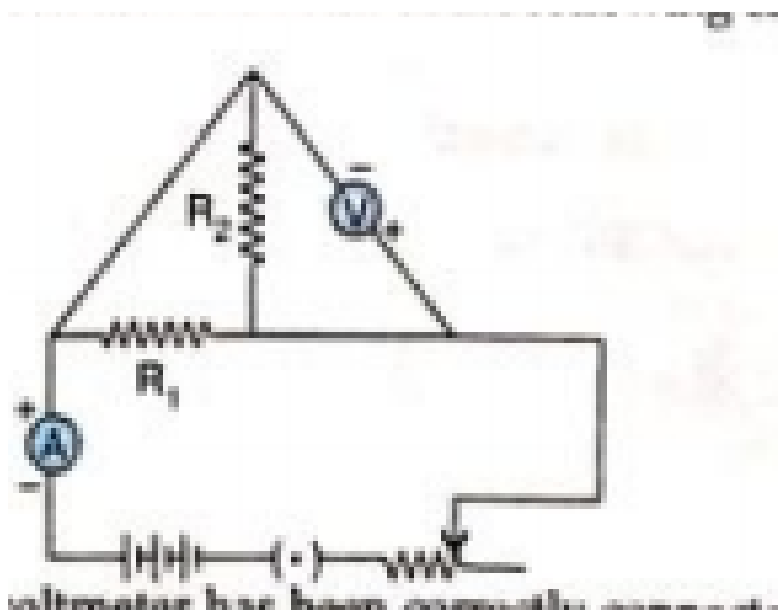
- A. The resistance R_1 and R_2 have been connected in series in both the circuits
- B. The resistors R_1 and R_2 are connected in parallel in both the circuits.
- C. IN the circuit the resistors have been connected in parallel, whereas these are connected in series in circuit.
- D. In the circuit the resistors are connected in series, while in circuit is parallel

Answer:



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84. The only correct statement for the following circuit is



A. The voltmeter has been correctly connected in the circuit.

B. The ammeter has been correctly connected in the circuit

C. The resistors R_2 and R_1 have been correctly connected in series.

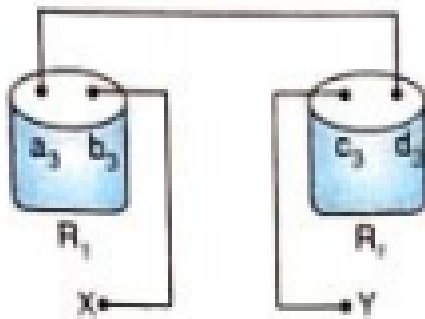
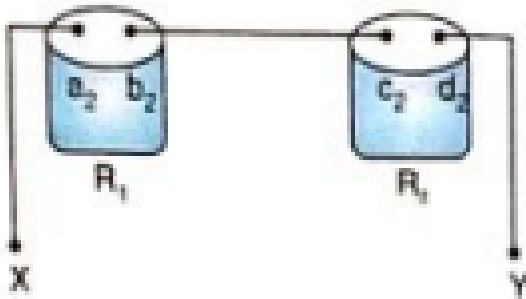
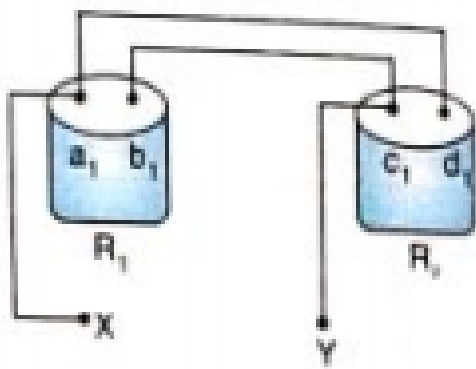
D. The resistors R_1 and R_2 have been correctly connected in parallel.

Answer:



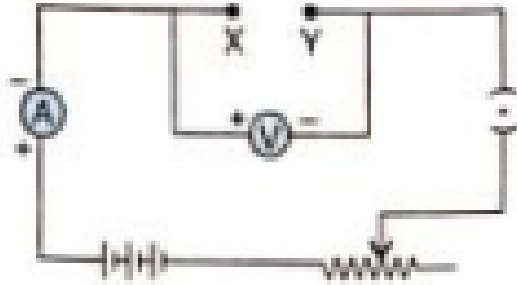
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85. Three students (A),(B) and (C) connected their two resistor R_1 and R_2 in the manner shown below.



They connected the terminals marked X and Y above to the two terminals marked X and Y in

the circuit given below:



They record the ammeter readings for different positions of the rheostat and the corresponding voltmeter readings. The average value of the ratio V/I in their observations would be minimum for:

- A. Students A and B only
- B. Students B and C only

C. Students C and A only

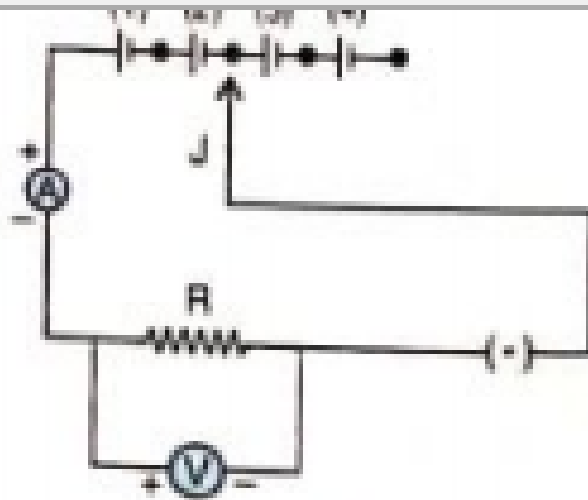
D. Students A only

Answer:

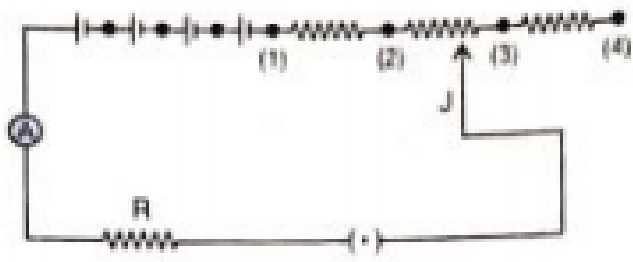


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86. To study the dependence of current on the potential difference across a resistor, two set ups shown in fig. A and B respectively. They kept the contact in different positions marked (1), (2), (3), (4) in the two figures.



(A)



(B)

For the two students their ammeter and voltmeter readings will be minimum when the contact J is in the positions

A. (1) both the set ups

B. (4) in both the set ups

C. (4) in set ups (A) and (1) set up (B)

D. (1) in set up (A) and (4) in set up(B)

Answer:



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87. While performing the experiment to study the dependence of current on potential difference across a resistor, following

observations were made by four students A, B and C and D

Student	Reading 1	Reading 2	Reading 3
A	V = 0.5V	V = 1.0V	V = 1.5V
	I = 0.1A	I = 0.2A	I = 0.3A
B	V = 0.8V	V = 1.6V	V = 2.4V
	I = 0.4A	I = 0.8A	I = 1.2A
C	V = 1.0V	V = 1.2V	V = 1.4V
	I = 0.5A	I = 1.4A	I = 1.0A
D	V = 2.4V	V = 2.7V	V = 3.0V
	I = 0.8A	I = 0.9A	I = 1.0A

The

teacher found that one of the students has made wrong observations. The student who made the mistake is :

A. A

B. B

C. C

D. D

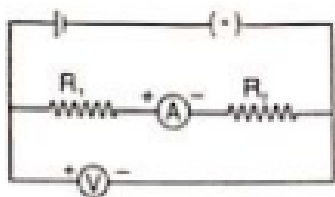
Answer:



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88. In an experiment to determine equivalent resistance of two resistors R_1 and R_2 in series, which one of the following circuit diagrams shows the correct way of connecting

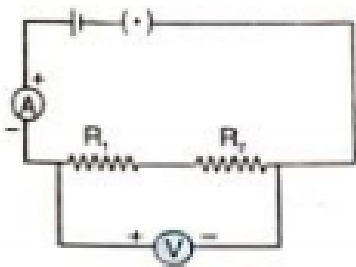
the voltmeter in the circuit?



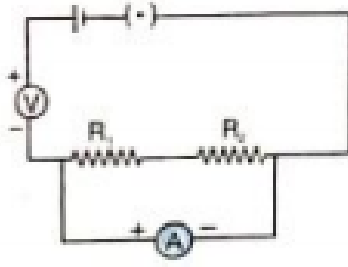
(I)



(II)

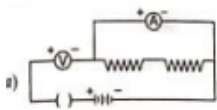


(III)

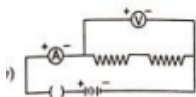


(IV)

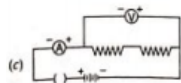
A.



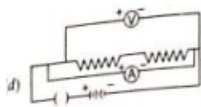
B.



C.



D.

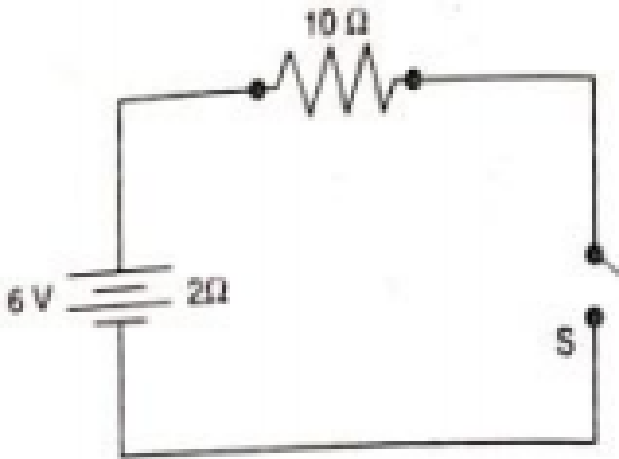


Answer:



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89. A 6 V battery for internal resistance 2 ohm is connected across a 10 ohm resistor and a switch in series, as shown:



If the switch is kept in the off positions, as shown in the figure, then

A. the voltage difference across the resistor is 6 V and that across the switch is zero

B. the voltage difference across the resistor is zero and that across the switch is 6V

C. the voltage difference across the resistor is 5V and that across the switch

is zero

D. the voltage difference across the resistor is 5V and that across the switch is 1V.

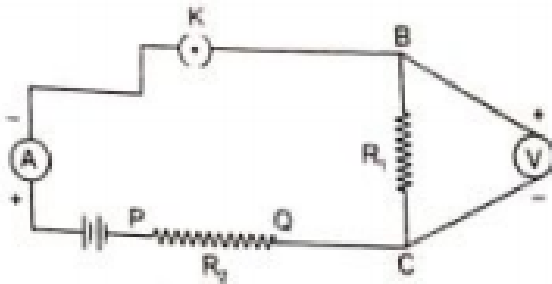
Answer:



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90. A student set up his for finding the equivalent resistance of a series combination of the two given resistors R_1 and R_2 in the manner as shown below. He did not obtain the

correct result in his experiment because of a mistake in the circuit. The mistake can be corrected by shifting the component.



A. Ammeter and connecting it across P and Q with correct polarity.

B. Ammeter and connecting it between K and B with correct polarity and B with correct polarity

C. Voltmete and connecting it across P and Q with correct polarity

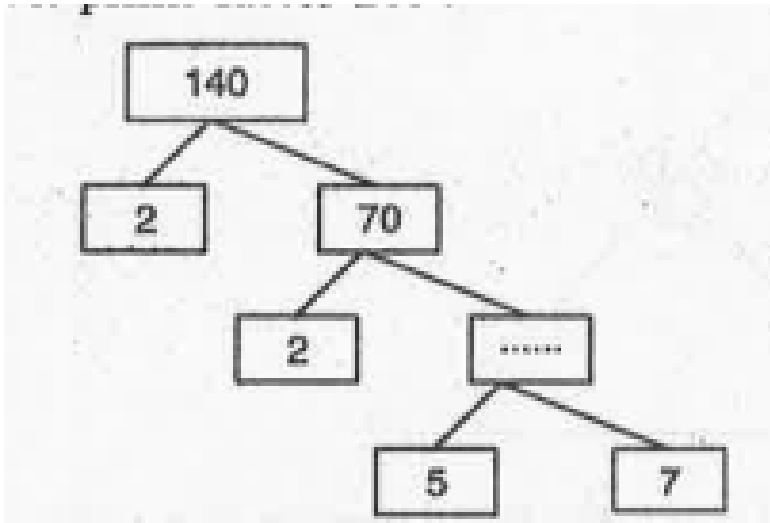
D. Voltmeter and connecting it across B and P with correct polarity.

Answer:



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91. Complete the prime factor tree :



A. Position of voltmeter is not correct

B. Position of ammeter is not correct

C. Terminals of voltmeter are not connected correctly

D. Terminals of ammeter are not connected correctly.

Answer:



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92. An ammeter and a voltmeter are joined in series to a cell. Their readings are A and V respectively. If a resistance is now joined in parallel with the voltmeter

- A. Both A and V will increase
- B. Both A and V will decrease
- C. A will decrease, v will increase
- D. A will increase, V will decrease.

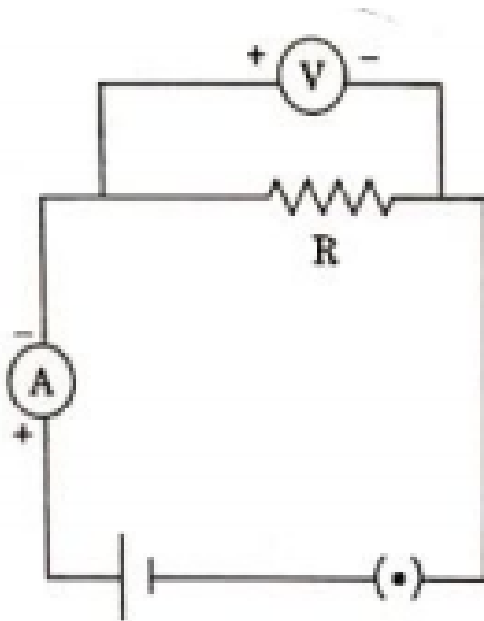
Answer:



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93. The number of division in ammeter of range 2A is 10 and voltmeter of range 5V is 20. when switch of the circuit given below is

closed, ammeter reading is at 8th division and
voltmeter reading is at 8th divisions. The value
of resistance of resistor is



- A. 1.25 ohm
- B. 2 ohm
- C. 0.75 ohm

D. 1.5 ohm

Answer:

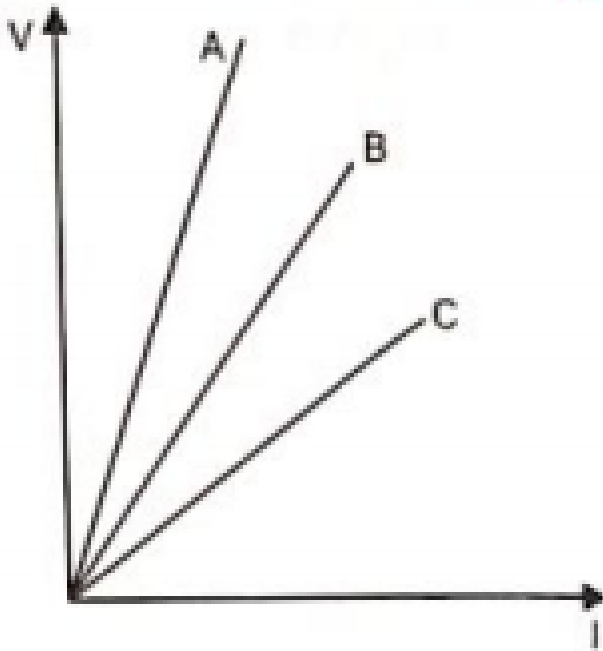


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94. Ohms law experiment is performed separately with individual resistors $R_1, R_2 (R_1 > R_2)$ and series combination of R_1, R_2 Graph us placed between potential difference V and current I as shown in figure for each case. Identify which one is for R_1, R_2

and combination of resistors?in the graph

A,B,C respectively represents



A. R_1 , R_2 and series combination

B. series combination R_2 , R_1

C. R_2 , R_1 and series combination

D. series combination R_1, R_2

Answer:



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95. In Ohm's law experiment the physical quantities which are to be kept constant while doing experiment is/are:

A. potential difference

B. current

C. temperature

D. potential difference, current,
temperature

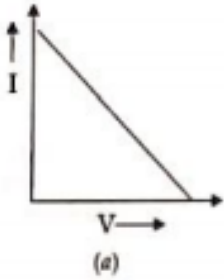
Answer:



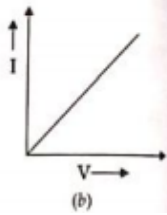
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96. The graph between current and the potential difference in the experimental verification of Ohm's law were drawn by four

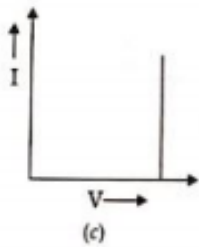
students as shown in fig. which one of the following is correct?



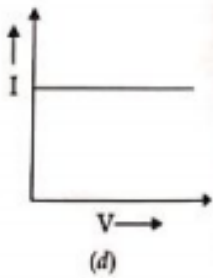
A.



B.



C.



D.

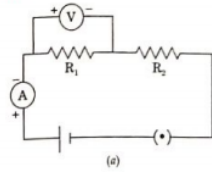
Answer:



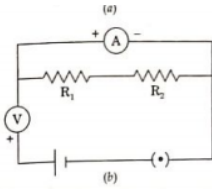
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97. The circuit diagram shown below is used to find the effective resistance of two resistors in series. Which circuit diagram represents correctly

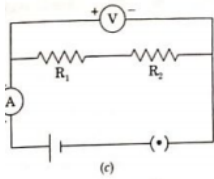
A.



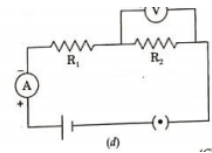
B.



C.



D.

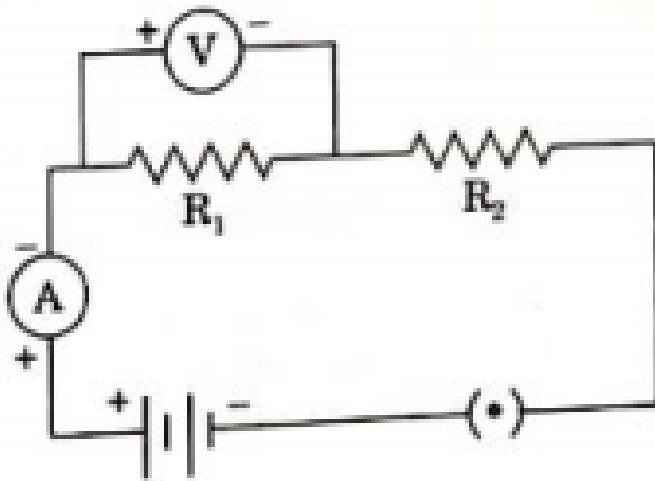


Answer:



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98. A student set up electric circuit shown here for finding the equivalent resistance of two resistors in series. In this circuit



A. resistors are correctly connected but voltmeter is wrongly connected.

B. resistors are correctly connected but ammeter is wrongly connected.

C. resistors as well as voltmeter are wrongly connected.

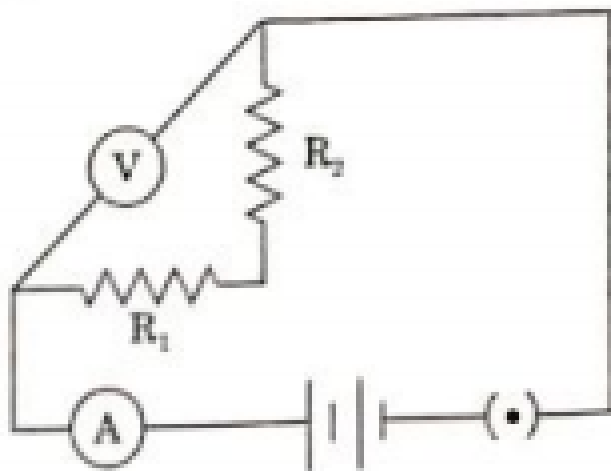
D. resistors as well as ammeter are wrongly connected.

Answer:

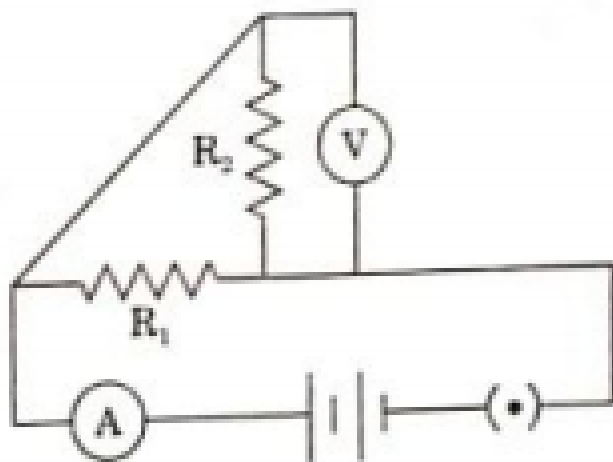


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99. In the circuit given ahead, the resistors R_1 and R_2 are connected



Circuit-I



Circuit-II

A. in parallel in both circuits

B. in series in both circuits

C. in parallel in circuit I and series in circuit II

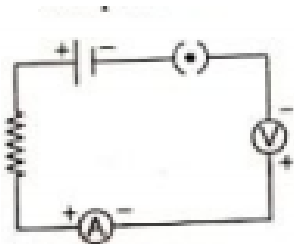
D. in series in the circuit I and parallel in
circuit II

Answer:

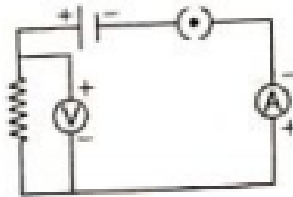


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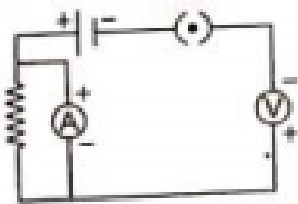
100. Identify the circuit in which the electrical components have been properly connected:



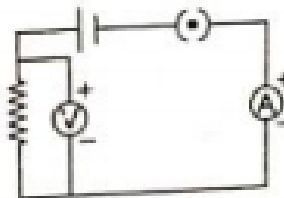
(i)



(ii)



(iii)



(iv)

ICRSE 2006-17.

A. (i)

B. (ii)

C. (iii)

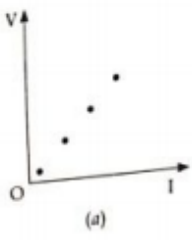
D. (iv)

Answer:

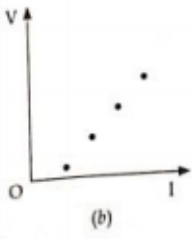


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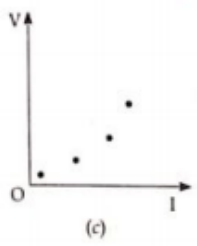
101. 4 students plotted the graph showing dependence of current I on potential difference V across using their recorded observations. The most appropriate graph is



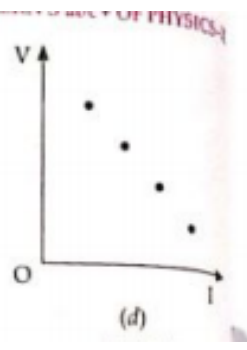
A.



B.



C.



D.

Answer:



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102. Define one watt hour.



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103. A cylinder of a material is 10 cm long and has a cross section of 2cm^2 . If its resistance along the length be 20 ohm, what will be its resistivity in number and units?



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104. Explain the following : Why is the tungsten used almost exclusively for filament of electric lamps?



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105. A resistance of 10 ohm is bent in the form of a closed circle. What is the effective

resistance between the two points at the ends of any diameter of this circle?



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106. Why is much less heat generated in long electric cables than in filaments of electric bulbs?



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107. State which has a higher resistance a 50 W or a 25 w lamp bulb and how many times?



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108. Pick out conductors and insulators from the following

Metals, Glass, Rubber, Graphite, Dry wood, Dry air?



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109. Pick out conductors and insulators from the following

Metals, Glass, Rubber, Graphite, Dry wood, Dry air?



Watch Video Solution

110. Pick out conductors and insulators from the following

Metals, Glass, Rubber, Graphite, Dry wood, Dry air?



Watch Video Solution

111. Pick out conductors and insulators from the following

Metals, Glass, Rubber, Graphite, Dry wood, Dry air?



Watch Video Solution

112. Pick out conductors and insulators from the following

Metals, Glass, Rubber, Graphite, Dry wood, Dry air?



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113. Pick out conductors and insulators from the following

Metals, Glass, Rubber, Graphite, Dry wood, Dry air?



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114. Name a source of emf.



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115. What is SI unit of electric potential?



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



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117. you are given three resistors of 10 ohm 10 ohm and 20 Ohm a battery of EMF 2.5 volt one key an ammeter a voltmeter. draw a circuit diagram showing the correct connection of all given components such that voltmeter connected across the ends of 20 ohm resistor give the reading of 2.0 volt.



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118. The electrical resistivity of few materials is given below in ohm-metre. Which of the following can be used for making element of a heating device?

(CBSE Sample Paper 20)

A	6.84×10^{-8}
B	1.60×10^{-8}
C	1.00×10^{-4}
D	2.50×10^{12}
E	4.40×10^{-5}
F	2.30×10^{17}

Electrical resistivity for the material 2000



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119. An electric geyser has rating 2000W, 220V marked on it. What should be the minimum rating in whole number of a fuse wire, that may be required for safe use with this geyser.?



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120. Explain the following: How does the resistance of a wire vary with its area of cross-section?



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121. SI unit of current is:



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122. A filament of an electric lamp draws a current of 0.4 amperes. Which lights for 3 hours. calculate the amount of charge that flows through the circuit ?



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123. Name any one material having a small value of temperature coefficient of resistance.

Write one use of this material.



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124. An electric bulb draws a current of 0.2A when the voltage is 220 volts then calculate the amount of electric charge flowing through it in one hour.



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



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126. Will the 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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127. Will the current flow more easily through a thick wire or a thin wire of the same material when connected to the same source ? why?



Watch Video Solution

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



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129. While experimentally verifying ohm's law a student observed that pointer of the voltmeter coincide with 15th division when the voltmeter has a least count of 0.05 V. Find the observed reading of voltmeter?



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



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131. How is ammeter always connected in circuits?



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132. A copper wire has diameter 0.5 mm, and resistivity of $1.6 \times 10^{-8} \text{ ohm} - \text{m}$. What will be the length of this wire to make its resistance

10ohm? How much does the resistance change if the diameter is doubled.



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133. An electric iron has a rating 750 W, 220V. It is used for 5 hours daily. Calculate its resistance while glowing?



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134. An electric iron has a rating 750 W, 220V.

It is used for 5 hours daily. Calculate

its resistance while glowing?

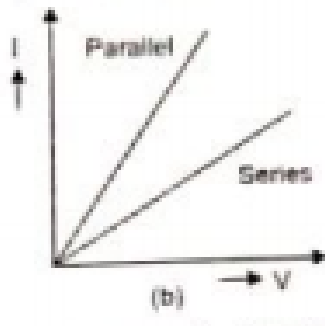
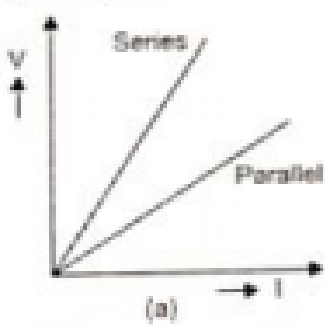


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135. Two students perform the experiments on series and parallel combinations of two given

resistors R_1 and R_2 and plotted the following

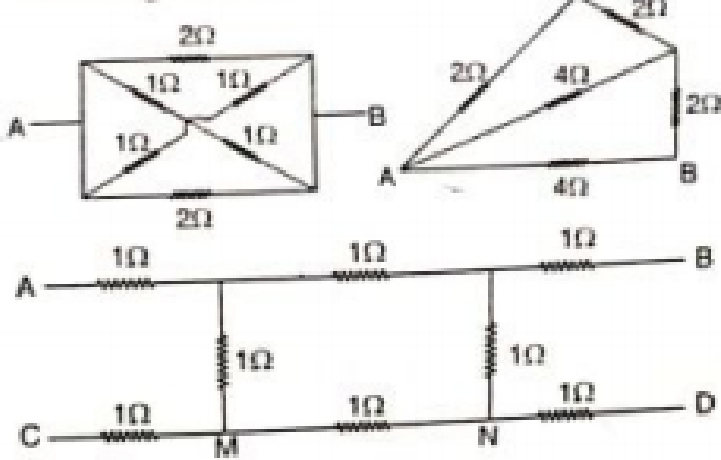
V-I graphs:



Which of the graph is correctly labelled in term sof the words "series" and "paralle"? justify your answer.

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136. Find the equivalent resistance between A and B in the following circuits:



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137. Two metallic wires A and B of same material are connected in parallel. Wire A has length l and radius r and wire B has length $2l$. Calculate the ratio of the total resistance of

parallel combination and the resistance of wire A?



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138. What is the meaning of the terms frequency of an alternating current? What is its value in India? Why is an alternating current considered to be advantageous over direct current for long range transmission of electric energy?



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139. Electrical resistivities of some substances at $20^{\circ}C$ are given below:

Silver	$1.6 \times 10^{-8} \Omega - m$
Copper	$1.62 \times 10^{-8} \Omega - m$
Tungsten	$5.20 \times 10^{-8} \Omega - m$
Iron	$10.0 \times 10^{-8} \Omega - m$
Mercury	$94.0 \times 10^{-8} \Omega - m$
Nichrome	$100 \times 10^{-8} \Omega - m$

Among silver and copper, which one is a better conductor? Why?



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140. Electrical resistivities of some substances at $20^{\circ}C$ are given below:

Silver	$1.6 \times 10^{-8} \Omega \cdot m$
Copper	$1.62 \times 10^{-8} \Omega \cdot m$
Tungsten	$5.20 \times 10^{-8} \Omega \cdot m$
Iron	$10.0 \times 10^{-8} \Omega \cdot m$
Mercury	$94.0 \times 10^{-8} \Omega \cdot m$
Nichrome	$100 \times 10^{-8} \Omega \cdot m$

Which material would you advise to be used in electrical heating devices. Why?



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141. What is electric circuit?



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142. Calculate the resistance of an electric bulb which allows a 10 A current when connected to a 220 V power sources?



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143. A piece of wire having resistance R is cut into four parts.

How does the resistance of each part compare with the original resistance?



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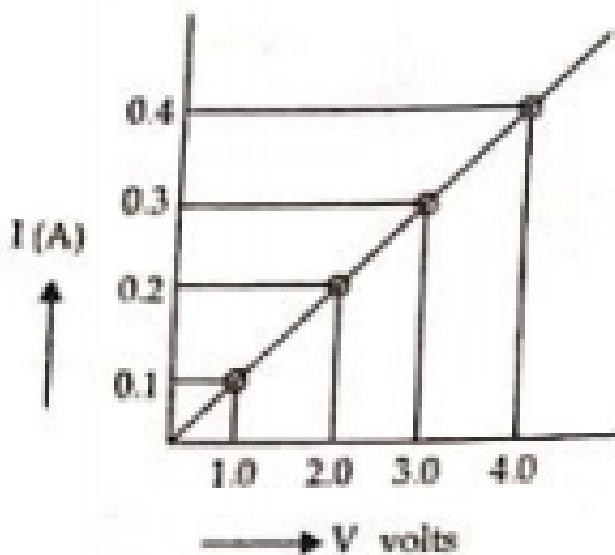
144. A piece of wire having resistance R is cut into four parts.

How does the resistance of each part compare with the original resistance?



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145. In an experimental to study the dependance of current on potential difference across a resistor, a student obtained graph s shown below:



Calculate the value of resistance of the resistor.

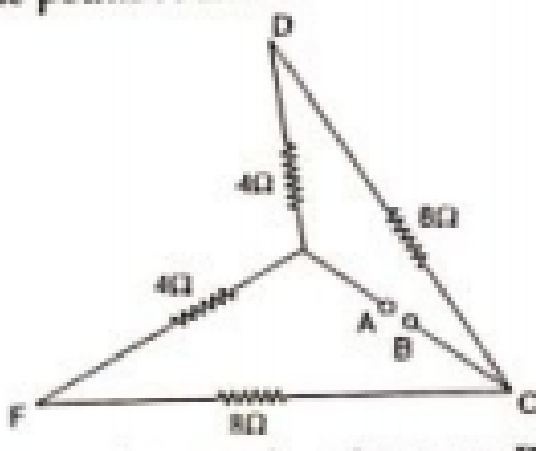
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146. Calculate the equivalent resistance between the points A and B in the following combinations.



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147. Calculate the equivalent resistance of the network across the points A and B.



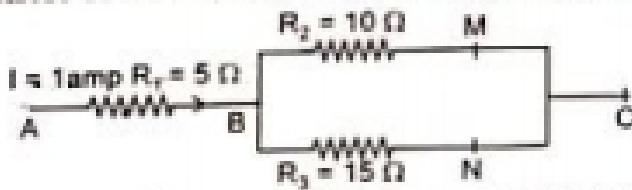
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148. When two resistors of resistance R_1 and R_2 are connected in parallel, the net resistance is 3 ohm. When connected in series. Its values of 16 ohm. Calculate the value of R_1 and R_2 .



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149. Three resistors are connected as shown. Through a resistor of 5 ohm, a current of 1 ampere is flowing

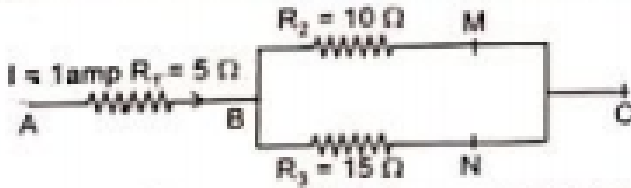


What is the potential difference across AB?



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150. Three resistors are connected as shown. Through a resistor of 5 ohm, a current of 1 ampere is flowing

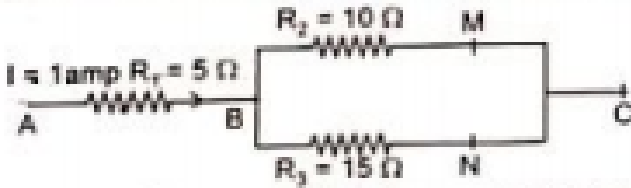


What is the current through the two resistors?



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151. Three resistors are connected as shown. Through a resistor of 5 ohm, a current of 1 ampere is flowing



What is the total resistance between A and C?



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152. An electric bulb is rated 220V and 100 W. what is its resistance? Five such bulbs burn for

4 hours. What is the electrical energy consumed? Calculate the cost if the rate is 50 paise per unit.



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153. State the formula correlating the electric current flowing in a conductor and in voltage applied across it also, show this relationship by drawing a graph. What would be the resistance of a conductor if the current

flowing through it is 0.35 ampere when the potential difference across it is 1.4 volt.



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154. A torch bulb is rated 5 V and 500 mA.

Calculate

its power?



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155. A torch bulb is rated 5 V and 500 mA.

Calculate

resistance?



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156. A torch bulb is rated 5 V and 500 mA.

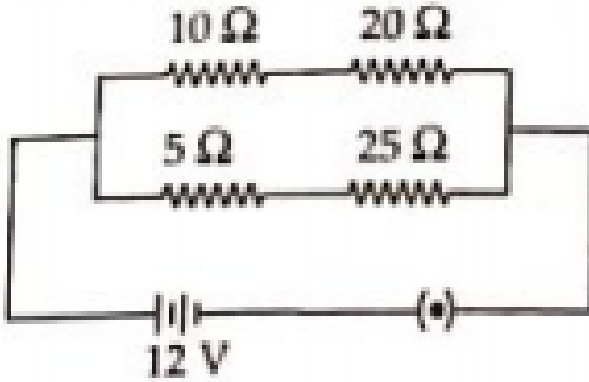
Calculate

energy consumed when it is lighted for 4 hours.



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157. In the given circuit, calculate

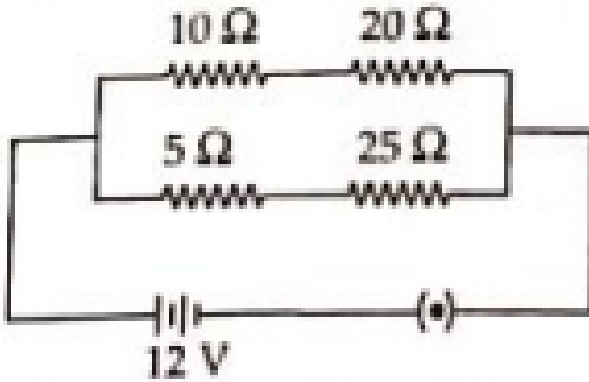


the total effective resistance.



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158. In the given circuit, calculate



the total current in the circuit.

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159. How can three resistors of resistance 2 ohm, 3 ohm and 5 ohm be connected to get a

total resistance of

3.875 ohm?



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160. How can three resistors of resistance 2 ohm, 3 ohm and 5 ohm be connected to get a total resistance of

0.9 ohm?



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



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162. Write in the form of a formula a relationship between resistance and resistivity of an ohmic conductor. A wire of length 'l' and resistance 'R' is stretched so that its length is

doubled and area of cross section is halved.

How will its

resistance change?



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163. Write in the form of a formula a relationship between resistance and resistivity of an ohmic conductor. A wire of length ' l ' and resistance ' R ' is stretched so that its length is doubled and area of cross section is halved.

How will its

resistivity change . Justify your answer in each case.



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164. What is meant by resistance of a conductor? On what factors does the resistance of conductor depends?



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165. State Ohm's law and derive it from the basic ideas of drift velocity of electrons.



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166. Draw a schematic diagram of the circuit for studying ohm's law.



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167. Write an expression for the amount of heat produced in a wire of resistance R and carrying a current I for time. An electric heater of resistance 10 ohm draws 15 A from the service mains for 2 hours . Calculate the heat developed in the heater?



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168. Write an expression for the amount of heat produced in a wire of resistance R and

carrying a current I for time. An electric heater of resistance $10\ \text{ohm}$ draws $15\ \text{A}$ from the service mains for 2 hours. Calculate the power of the heater.



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169. State the relationship between the power P , consumed by a device, its resistance R and current I , flowing through it

An electric iron of resistance $20\ \text{ohm}$ takes a

current of 5A. Calculate

its electric power?



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170. State the relationship between the power P , consumed by a device, its resistance R and current I , flowing through it

An electric iron of resistance 20 ohm takes a current of 5A. Calculate

the heat generated by it in 30 seconds.



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171. What determines the rate at which energy is delivered by a electric current? An electric motor takes 5A from a 220 V line. Calculate



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172. An electric motor takes 5A form a 220 V line. Determine the power of the motor and the energy consumed in 2 hours



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173. An electric motor takes 5A from a 220 V line. Calculate the energy consumed by it in 30 seconds.



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174. Define the term volt.



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175. State the relation between work, charge and potential difference for an electric circuit.

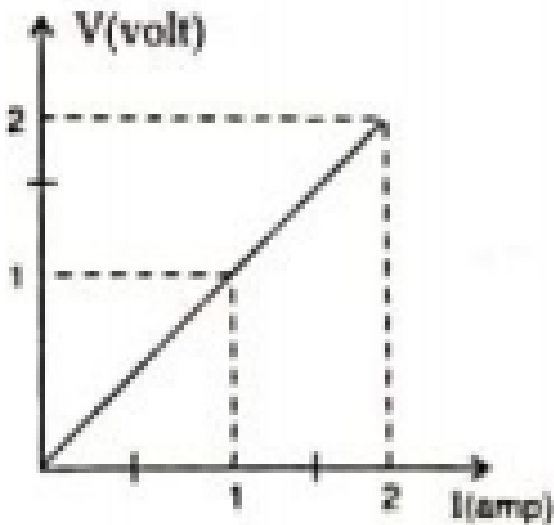
Calculate the potential difference between the two terminals of a battery if 100 J of work is required to transfer 20 C of charge from one terminal of the battery to the other.



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176. An electric circuit consisting of a 1 m long metallic wire XY, an ammeter, a voltmeter, 4

cells of 1.5 V and a plug key was set up. Draw a schematic diagram of this electric circuit on the on position. Following graph was plotted between the values of potential difference and current. what conclusions do you draw about the relation between V and I from this graph? state this relations in your words.





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177. Differentiate between electrical resistance and resistivity of a conductor?



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178. A copper wire of resistivity $1.6 \times 10^{-8} \text{ ohm} - \text{m}$ has a cross sectional area of $20 \times 10^{-4} \text{ cm}^2$. Calculate the length of wire required to make a 10 ohm coil.



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179. State the function of a fuse in a circuit.

How is it connected in the domestic circuit?



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180. An electric fuse of rating 3A is connected in a circuit in which electric iron of power 1 kW is connected which operates at 220V. What would happen?



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181. Three resistance R_1 , R_2 and R_3 are connected on parallel. Show that their equivalent resistance is

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$



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182. Express ohm's law by a mathematical formula.



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183. Write ohm's law. Draw a circuit diagram to prove it experimentally in the laboratory?



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184. Present the relationship between the voltage applied across a conductor and the current flowing through it graphically.



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185. Find the equivalent of resistances of the individual resistance connected in series?

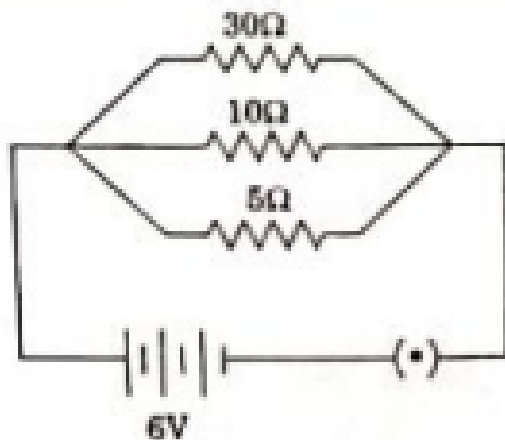


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186. Two wires X and Y are of equal length and have equal resistance. If the resistivity of X is more than that of Y which wire is thicker and why?

For the electric circuit given below calculate

current in each resistor.



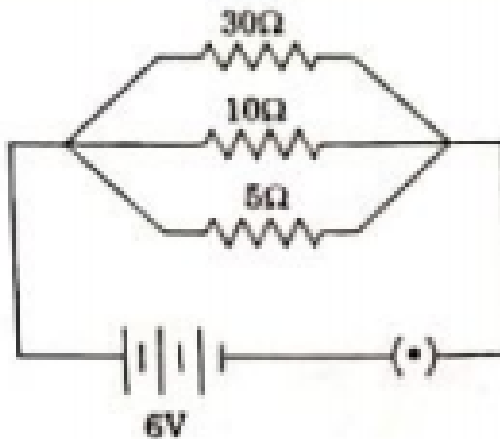
[Watch Video Solution](#)

187. Two wires X and Y are of equal length and have equal resistance. If the resistivity of X is more than that of Y which wire is thicker and

why?

For the electric circuit given below calculate

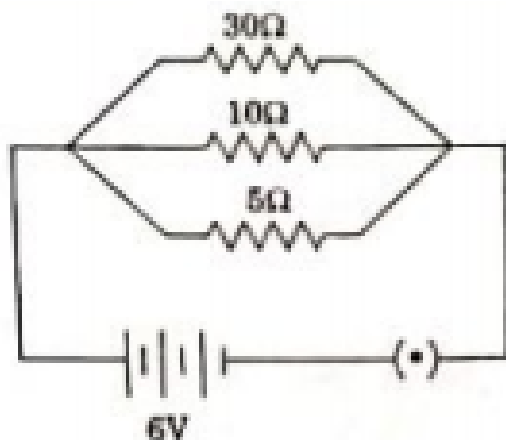
Total current drawn from the battery.



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188. Two wires X and Y are of equal length and have equal resistance. If the resistivity of X is more than that of Y which wire is thicker and why?

For the electric circuit given below calculate Equivalent resistance of the current.



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189. State Ohm's law. Write the symbols used in electric circuit to represent variable resistance?



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190. State Ohm's law. Write the symbols used in electric circuit to represent voltmeter?



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191. Two resistors of resistance 4 ohm and 12 ohm are connected in parallel. Calculate the values of effective resistance in each case.



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192. Two resistors of resistance 4 ohm and 12 ohm are connected in series. Calculate the values of effective resistance in each case.



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193. The electric power consumed by a device may be calculated by using either of the two expressions $P = I^2 R$ or $P = \frac{V^2}{R}$. The first expression indicates that it is directly proportional to R whereas the second expression indicates inverse proportionality. How can the seemingly different dependence of P on R in these expressions be explained?



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194. Explain the following : Why is the tungsten used almost exclusively for filament of electric lamps?



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195. Explain the following : Why are copper and aluminium usually employed for electricity transmission?



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196. State ohm's law. Write the necessary conditins for its validity. How is the law verified experimentally? What will be the nature of graph between V and I for a conductors? Name the physical quantity which can be determined by this grpah?



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197. In a household electric circuit, different appliances are connected in parallel to one another. Give two reasons An electrician puts a

fuse of rating 5A in that part of domestic electrical circuit in which an electrical heater of rating 1.5 kW, 220V is operating. What is likely to happen in this case and why? What change, if any, needs to be made?



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198. What is joule's heating effect? List applications of joule's heating effect in our daily life.



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



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200. How much energy is given to 5 coulomb of charge passing through a 12 V battery?



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201. An electric heater coil is connected to a 230 V source if the resistance of the heater coil is 220 ohm. Find the current.



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



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203. Two resistors with resistance 5 ohm and 10 ohm respectively are to be connected to a battery of emf 6V so as to obtain:

maximum current

minimum current flowing

How will you connect the resistance in each case.



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204. Two resistors with resistance 5 ohm and 10 ohm respectively are to be connected to a battery of emf 6V so as to obtain:

maximum current

minimum current flowing

Calculate the strength of the total current in the circuit in the two cases.



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205. A current of 1A flows on a wire for 5 minutes, find the amount of electric charge that flows through the wire.



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206. How much work is done in moving a charge of 5C between two points in a circuit having a potential difference of 10 V?



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207. An electric bulb is connected to a 220 V source. If the resistance of the bulb filament is 1000 ohm. Find the current.



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208. An electric heater coils is connect to a 220 V source. If the resistance of the heater coil is 220 ohm. Find the current.



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209. Resistance of a metal wire of length 2 m is 40 ohm. If the diameter of the wire is 0.3 mm. What will be the resistivity of the metal at that temperature?



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210. A 8 ohm resistance wire is stretched to double its length. Calculate the new resistance of the wire.



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211. A bulb whose resistance is 10 ohm is connected to a 6 V battery. Calculate the current through the circuit?



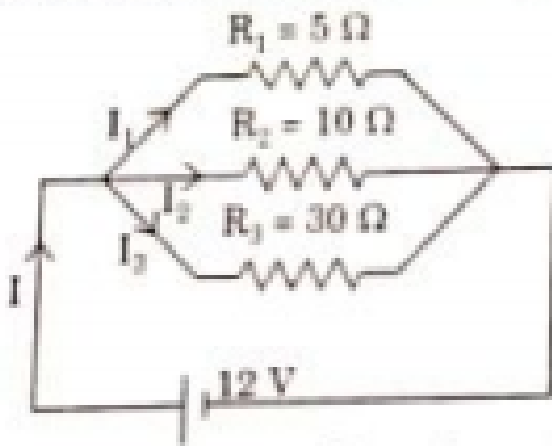
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212. A bulb whose resistance is 10 ohm is connected to a 6 V battery. Calculate the potential difference across the bulb.



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213. In the circuit diagram suppose the resistors R_1 , R_2 and R_3 have the values of 5 ohm, 10 ohm and 30 ohm respectively. Which have been connected to a battery of 12 V.

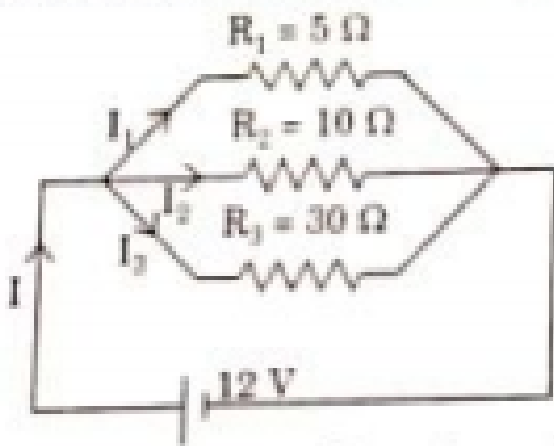


Calculate the current through each resistor?



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214. In the circuit diagram suppose the resistors R_1 , R_2 and R_3 have the values of 5 ohm, 10 ohm and 30 ohm respectively. Which have been connected to a battery of 12 V.

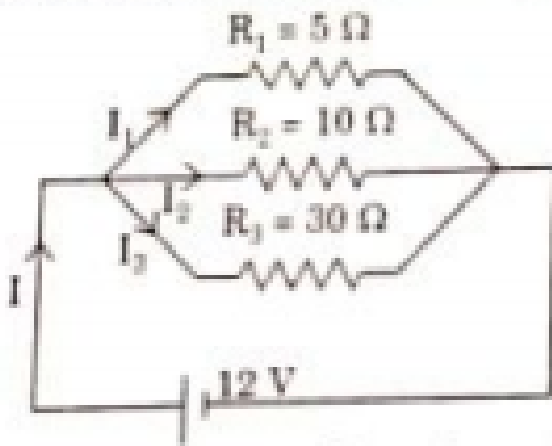


the total current in the circuit?



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215. In the circuit diagram suppose the resistors R_1 , R_2 and R_3 have the values of 5 ohm, 10 ohm and 30 ohm respectively. Which have been connected to a battery of 12 V.

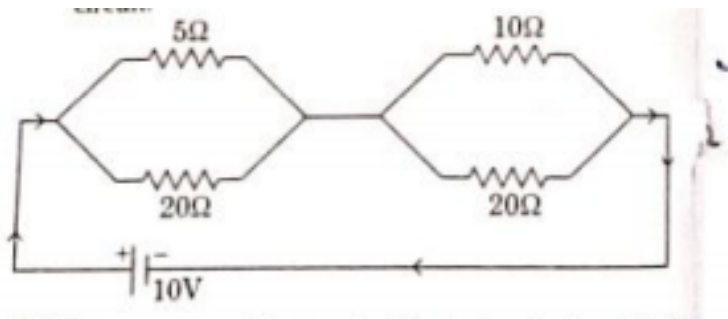


the total circuit resistance.



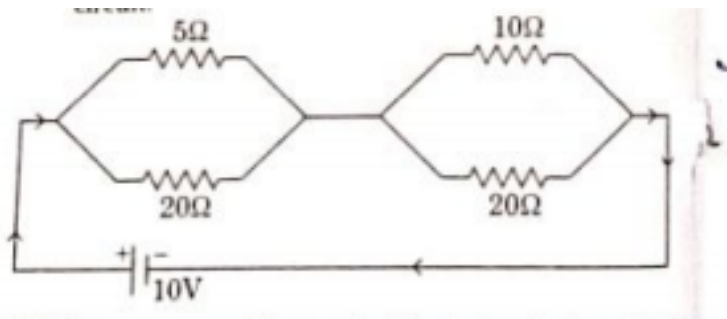
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216. In the given figure $R_1 = 5\text{ohm}$,
 $R_2 = 20\text{ohm}$, $R_3 = 10\text{ohm}$, $R_4 = 20\text{ohm}$
and a 10 V battery is connected to the
arrangement. Calculate
the total resistance in the circuit?



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217. In the given figure $R_1 = 5\text{ohm}$,
 $R_2 = 20\text{ohm}$, $R_3 = 10\text{ohm}$, $R_4 = 20\text{ohm}$
and a 10 V battery is connected to the
arrangement. Calculate
the total current flowing in the circuit.



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218. The energy spent by an electric device is at a rate of 1000 W when heating is at the maximum rate and 300 W when heating is minimum. The voltage is 200 V. What are the current and the resistance in each case?



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219. 500 J of energy is produced each second in a 20 ohm bulb. Find the potential difference across the bulb.





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220. An electric bulb is connected to a 220 V source. The current flowing is 0.25 A. what is the power of the bulb?



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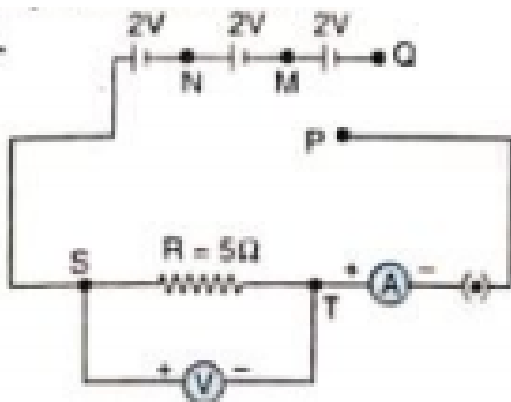
221. An electric refrigerator rated 500 W operates 24 hours/day. What is the cost of the energy to operate it for 20 days at Rs.2.00 per kWh?



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222. With the help of given diagram answer the following:

what will be the current shown by the ammeter and the potential difference between point S and T



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when

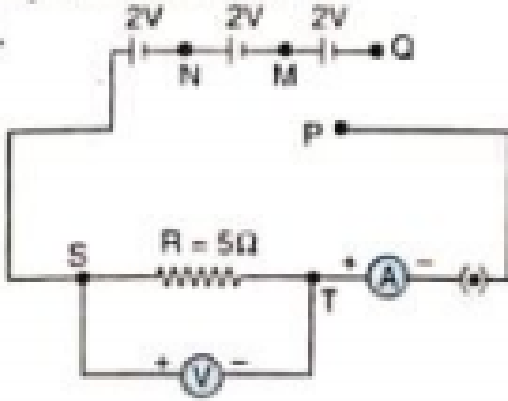
P is connected to Q?



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223. With the help of given diagram answer the following:

what will be the current shown by the ammeter and the potential difference between point S and T



1. am

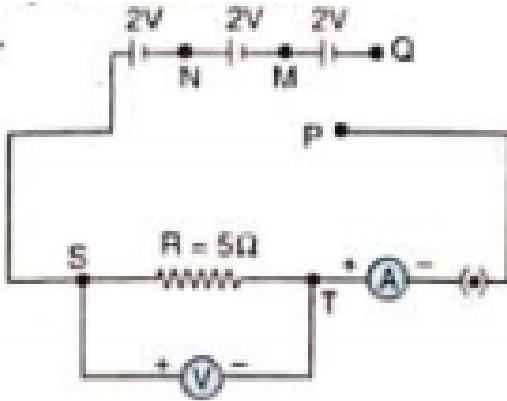
P is connected to M?

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224. With the help of given diagram answer the following:

what will be the current shown by the ammeter and the potential difference between

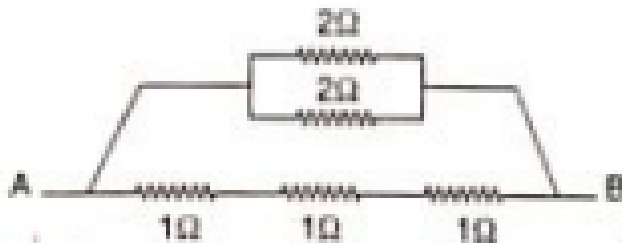
point S and T



Exam

P is connected to N?

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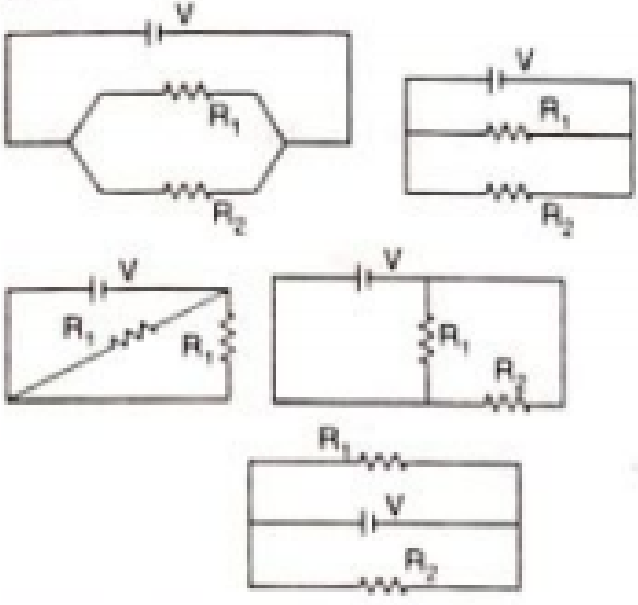
225. the resistance between A and B

find the resistance between A and B.



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226. What is the difference between the following electrical circuits?



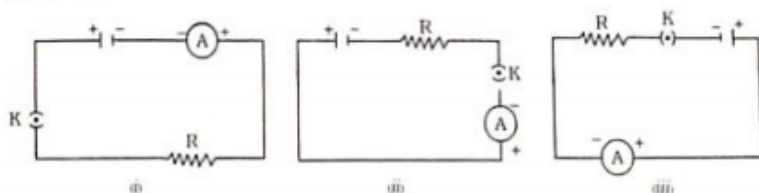
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227. An electric room heater is rated at 2 kW. Calculate the cost of using it for 2 hours daily for the month of September, if each unit costs Rs. 4.00



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228. A cell, a resistor, a key and ammeter are arranged as shown in the circuit diagram. The current recorded in the ammeter will be



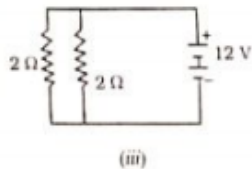
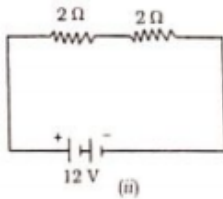
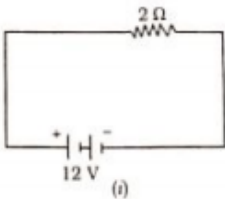
- A. maximum in (i)
- B. minimum in (ii)
- C. maximum in (iii)

D. the same in all the cases

Answer:

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229. In the following circuits, heat produced in the resistor or combinations of resistors is connected to a 12 V battery will be



A. same in all the cases

B. minimum in case (i)

C. maximum in case (ii)

D. maximum in case (iii)

Answer:



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230. Electrical resistivity of a given metallic wire depends upon

A. its length

B. its thickness

C. its shape

D. nature of the material.

Answer:



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231. A current 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^{16}

C. 10^{13}

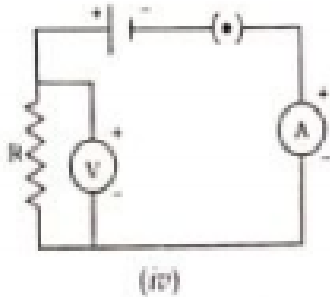
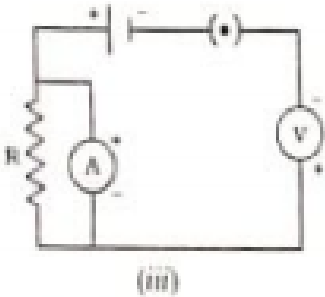
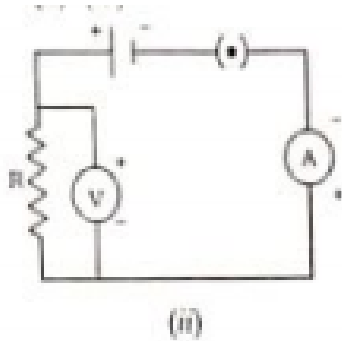
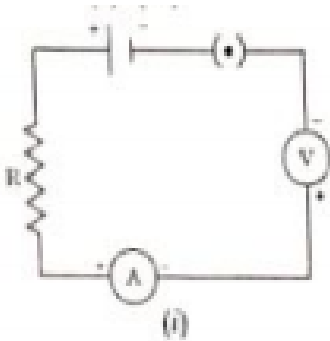
D. 10^{21}

Answer:



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232. Identify the circuit in which the electrical components have been properly connected.



A. (i)

B. (ii)

C. (iii)

D. (iv)

Answer:



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233. What is the maximum resistance which can be made using five resistors each of $\frac{1}{5}$ ohm

A. $\frac{1}{5}$ ohm

B. 10 ohm

C. 5 ohm

D. 1 ohm

Answer:



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234. What is the minimum resistance which can be made using five resistors each of $1/5$?

A. $1/5$ ohm

B. $1/25$ ohm

C. $1/10$ ohm

D. 25 ohm

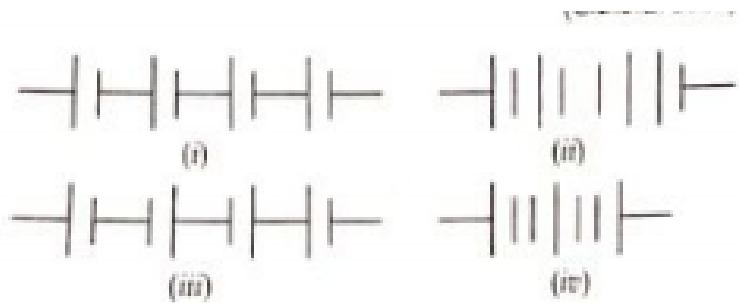
Answer:



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235. The proper representation of series combination of cells obtaining maximum

potential is



A. (i)

B. (ii)

C. (iii)

D. (iv)

Answer:



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236. Which of the following represents voltage?

A. $(\text{Workdone}) / (\text{current} \times \text{time})$

B. $\text{Work done} \times \text{Charge}$

C. $(\text{Work done} \times \text{Time}) / (\text{Current})$

D. $\text{Work done} \times \text{charge} \times \text{time}$

Answer:



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237. 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. $2A$

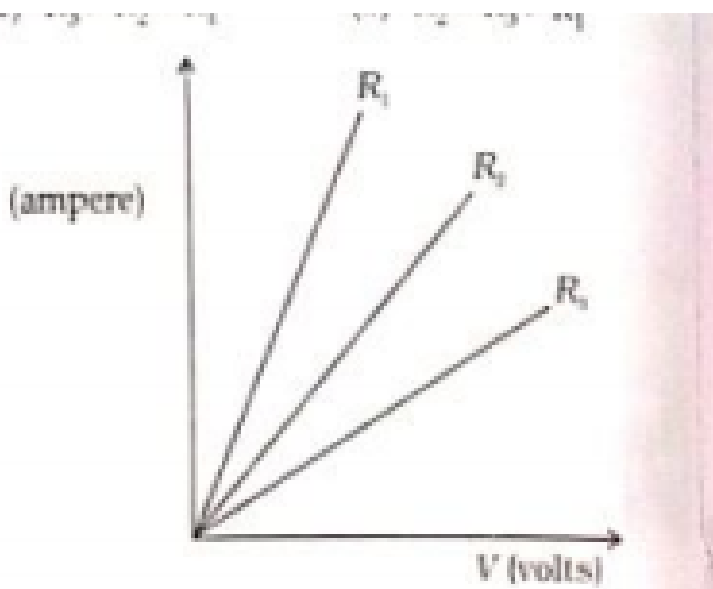
D. $3A$

Answer:





238. A student carries out an experiment and plots of V-I graph of three samples of nichrome wire was resistance 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. $R_2 > R_1 > R_3$

Answer:



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239. If the current I through a resistor is increase by 100% the increase in power dissipated will be

A. 1

B. 2

C. 3

D. 4

Answer:



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240. 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

Answer:



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241. 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.

Answer:



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242. In an electrical circuit two resistors of 2 ohm and 4 ohm respectively are connected in series to a 6 V battery. The heat dissipated by the 4 ohm resistor in 5 s will be

A. 5 J

B. 10 J

C. 20 J

D. 30 J

Answer:



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243. An electric kettle consumes 1kW of electric power when operated at 220 V. A fuse wire of the what rating must be used for it?

A. 1A

B. 2A

C. 4A

D. 5A

Answer:



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244. Two resistors of resistance 2 ohm and 4 ohm 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 difference across
them when connected in parallel.

Answer:



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245. Unit of electric power may also be expressed as

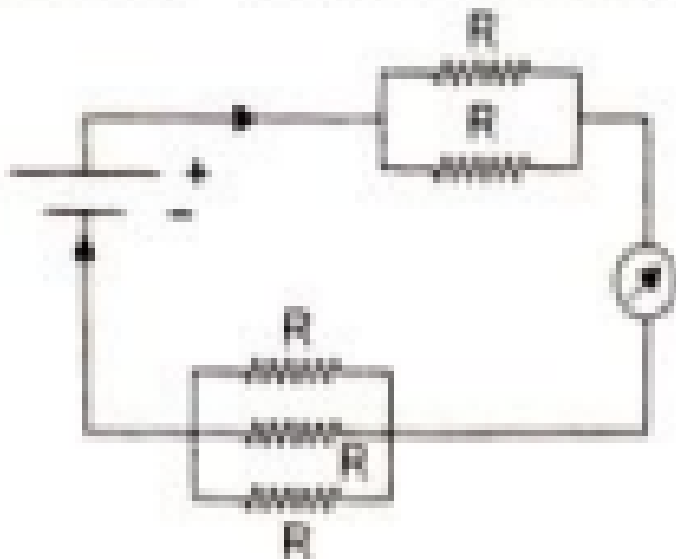
- A. volt ampere
- B. kilowatt hour
- C. watt second
- D. joule second

Answer:



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246. In the circuit given below what will be the ratio of current flowing in the upper arm 'R' and lower arm 'R'.



A. $2/3$

B. $5/3$

C. $3/2$

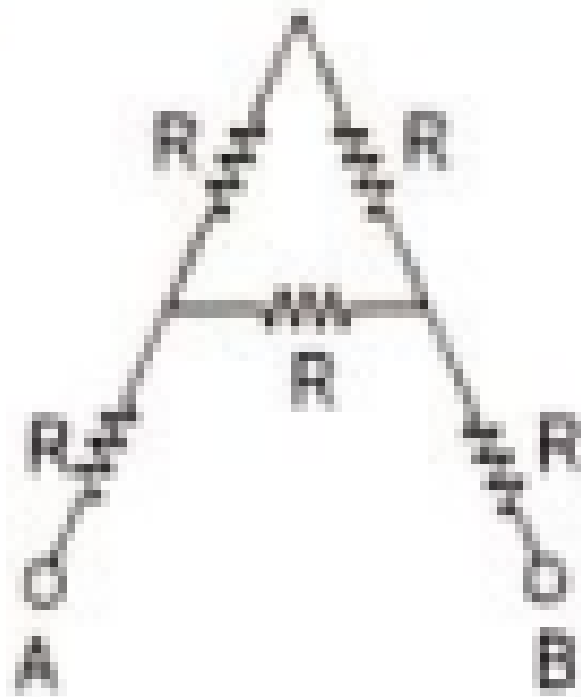
D. 1/5

Answer:



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247. What will be the equivalent resistance between point A and B in the given circuit.



A. $(5/3)R$

B. $2R$

C. $(8/3)R$

D. $3R$

Answer:

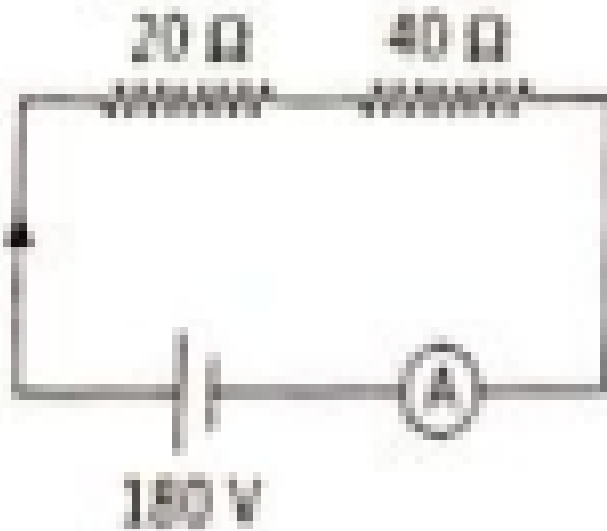


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248. The number of electrons that travel through the given resistor 20 ohm in the

circuit in one second is

(electrons)



A. 18.75×10^{18}

B. 18.75×10^{19}

C. 1.875×10^{15}

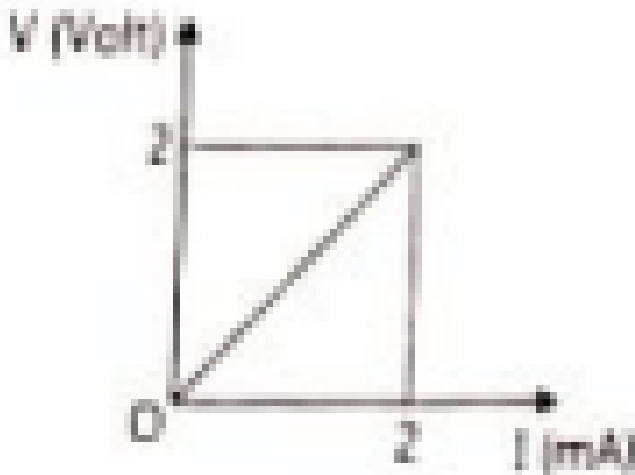
D. 1.875×10^{13}

Answer:



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249. The resistance of the given resistor that is calculate from the graph is



A. 1ohm

B. 10ohm

C. 100ohm

D. 1000ohm

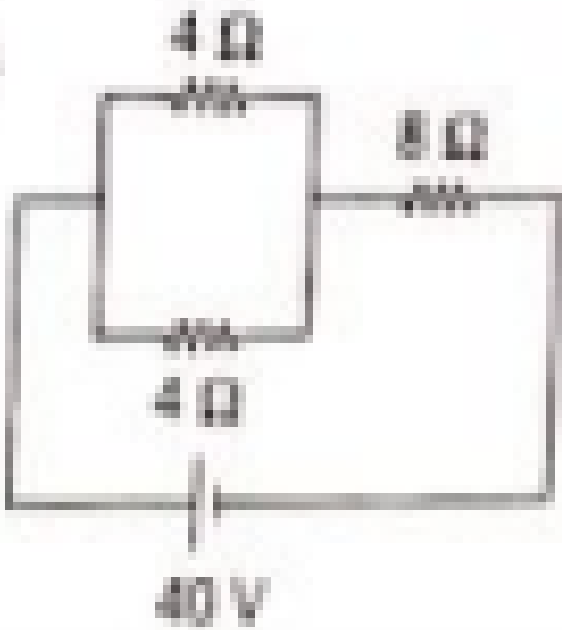
Answer:



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250. The voltage across 8 ohm resistance is

is



A. 42 V

B. 32 V

C. 22 V

D. 20 V

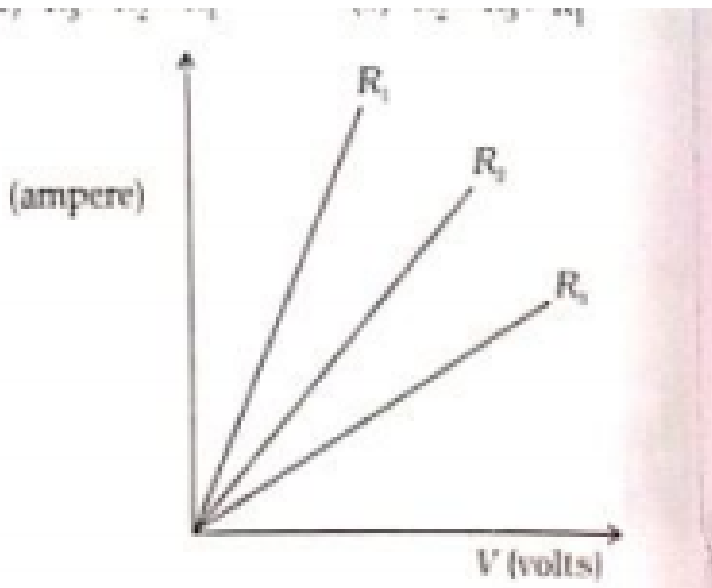
Answer:



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251. A student carries out an experiment and plots of V-I graph of three samples of nichrome wire was resistance 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. $R_3 > R_2 > R_1$

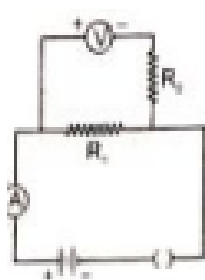
D. $R_2 > R_1 > R_3$

Answer:

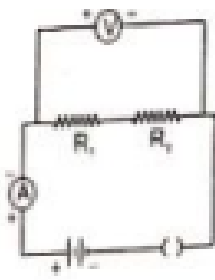


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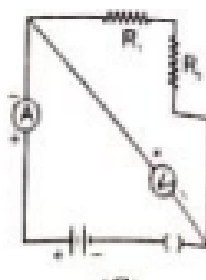
252. While doing their experiment on finding the equivalent resistance of two resistors connected in series. The student A,B and C set up their circuits as shown. The correct set up is that of:



(A)



(B)



(C)

A. Students A and B

B. Students B and C

C. Students C and A

D. All the three students.

Answer:



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253. Fill ups

The resistance of a conductor depends on.....and.....

- A. only on potential difference across the ends of the conductor
- B. only on current flowing through the conductor
- C. on both (1) and (2)
- D. Neither on (1) nor on (2)

Answer:



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254. An ammeter has 10 divisions between mark 0 and mark 2 on its scale. Which of the following reading the ammeter cannot read

A. 0.2 A

B. 1.0 A

C. 1.8 A

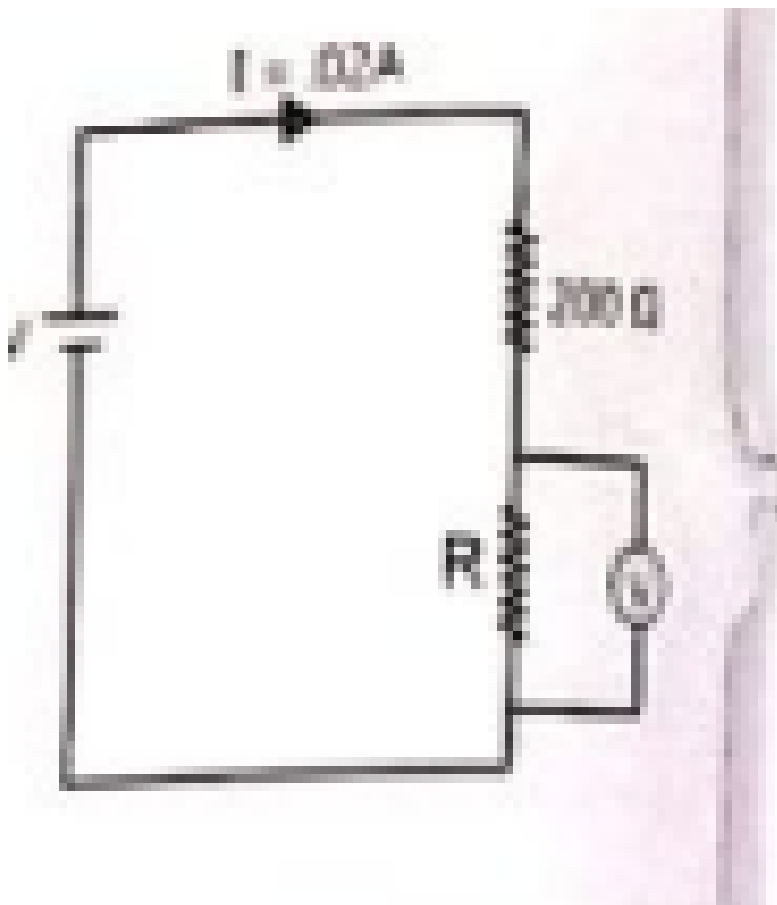
D. 1.9 A

Answer:



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255. The reading of ideal voltmeter V connected across R and the circuit shown is



A. $1\ \text{V}$

B. 2 V

C. 3 V

D. 4 V

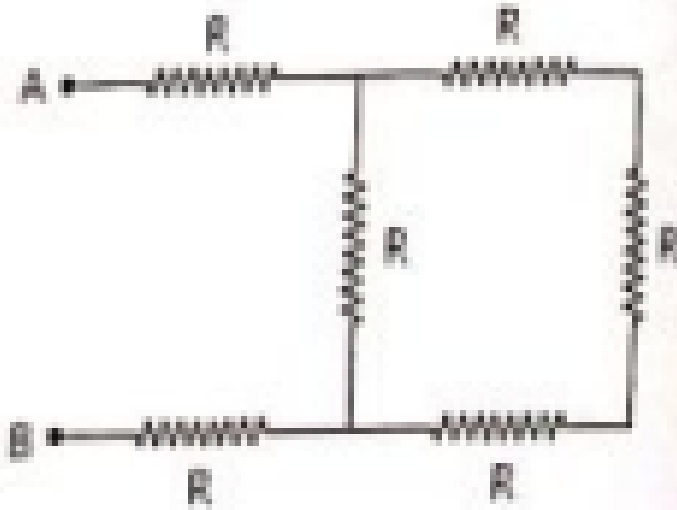
Answer:



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256. The value of equivalent resistance between the points A and B in the given circuit

will be



A. $6R$

B. $\frac{4R}{11}$

C. $\frac{11R}{4}$

D. $\frac{R}{6}$

Answer:



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257. What is the equivalent resistance between any two vertex of a triangle if the sides of the triangle are of equal resistance

A. $3R$

B. $2R$

C. R

D. $\frac{2R}{3}$

Answer:



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258. Two lamps A rated 100 watt 220 V and B rated 60 watt 220 V are connected in series to electric main supply of 220 V. the ratio of heat produced in lamp A to the lamp B would be

A. 3: 5

B. 5: 3

C. 4: 5

D. 5: 4

Answer:



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259. A bulb(220 V, 60 W) is operated on 110V supply then power developed in its is

A. 15 W

B. 30 W

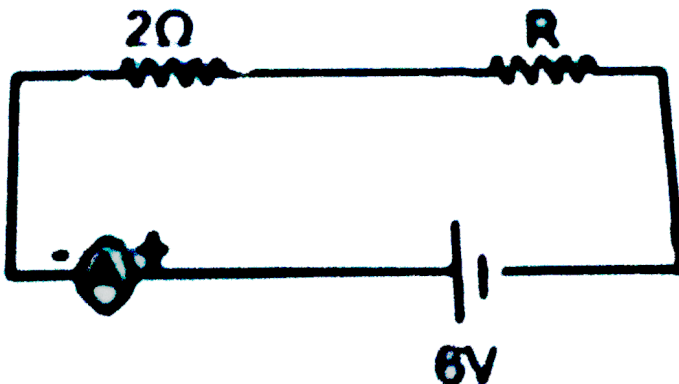
C. 65 W

D. 60 W

Answer:

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260. If the ammeter in the given circuit reads 2A, the resistance R is



A. 1ohm

B. 2ohm

C. 3ohm

D. 4ohm

Answer:



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261. An electric bulb marked $40\text{W}-200\text{ V}$ is used in a circuit of supply voltage 100V . Now its power is

A. 100 W

B. 40 W

C. 20 W

D. 10 W

Answer:



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262. If two identical heaters each rated as 1000 W, 220V are connected in parallel to 220 V, then the total power consumed as

A. 200 W

B. 2500 W

C. 250 W

D. 2000 W

Answer:



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263. What is the maximum resistance which can be made using five resistors each of $\frac{1}{5}$ ohm

A. $\frac{1}{5} \text{ohm}$

B. 10ohm

C. 5ohm

D. 1ohm

Answer:



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264. 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. $\frac{A}{2}$

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

C. $2A$

D. $3A$

Answer:



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265. 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

Answer:



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266. In an electrical circuit two resistors of 2 ohm and 4 ohm respectively are connected in series to a 6 V battery. The heat dissipated by the 4 ohm resistor in 5 s will be

A. 5 J

B. 10 J

C. 20 J

D. 30 J

Answer:



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267. A number of cells when connected in series form

- A. A generator
- B. an inverter
- C. a battery
- D. a battery eliminator

Answer:



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268. In a voltmeter there are 20 divisions between the 0 mark and 0.5 V mark. The least count of the voltmeter is

A. 0.020V

B. 0.025 V

C. 0.050 V

D. 0.250V

Answer:



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269. Which of the following statements does not represent ohm's law?

A. current/potential difference=constant

B. potential difference /current=constant

C. potential difference =current x
resistance

D. current= resistance x potential
difference

Answer:



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270. True or false

The resistance of ammeter is very high.



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271. True or false

In a circuit resistance is doubled the current to half.



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272. True or false

Germanium is a substance whose resistance decreases with temperature.



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273. True or false

A bird perched on a high voltage wire is killed by the current.



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274. True or false

Volt is represented by joule/coulomb.



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275. Fill ups

Among silver and copper.....is a better conductor.



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276. Resistance of a conductor depends on:



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277. Fill ups

The current through a lamp of 25 W operating at 200 V is..... .



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278. Fill ups

Lead tin alloy is used for making fuse because it has.....melting point.



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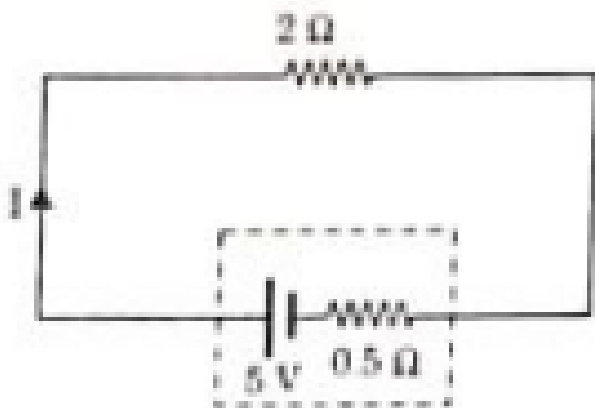
279. Fill ups

Nicrhome is used for making element because it has.....melting point.



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280. What is the current flowing in the given electric circuit?



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281. A wire of resistivity ρ is stretched to double its length. Then its new resistivity will:

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282. How many electrons make 10C of charge?



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283. Three 60 W incandescent bulbs are connected in a parallel.

Calculate the total power consumed.



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284. Three 60 W incandescent bulbs are connected in a parallel.

Now suppose that can one of the bulbs is fused what will be the total power consumed now?



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285. 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?



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286. 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?



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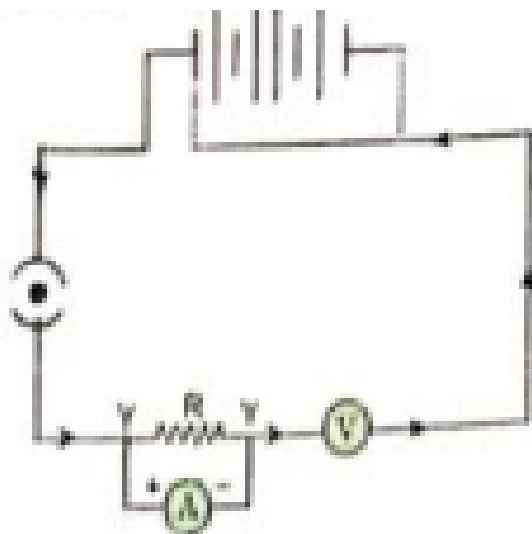
287. In an electrical circuit three incandescent bulbs A, B and C of rating 40 W, 60 W and 100 W respectively are connected in parallel to an electric source. Which of the following is likely to happen regarding their brightness?



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288. A child has drawn the electric circuit to study Ohm's law as shown in figure. His teacher told that the circuit diagram needs correction. Study the circuit diagram and

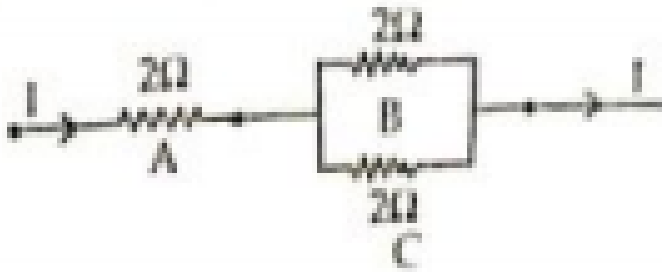
redrw it after making all corrections.



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289. Three 2ohm resistance A, B and C are connected as shown in figure. Each of them disipates energy and can withstand a

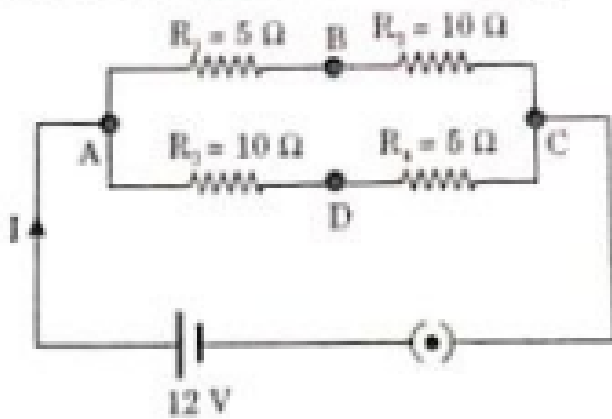
maximum power of 18W without melting. Find the maximum current that can flow through the three resistors.



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290. Find

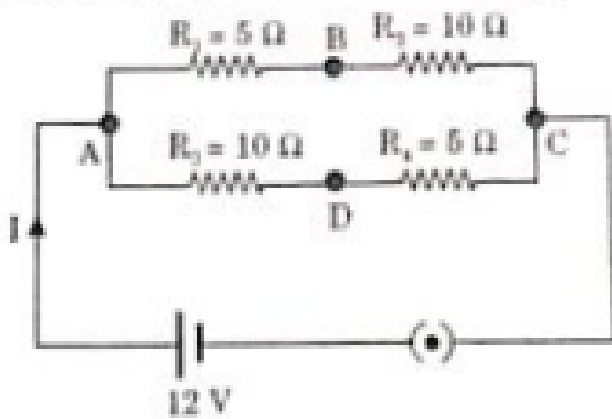
total resistance?



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291. Find

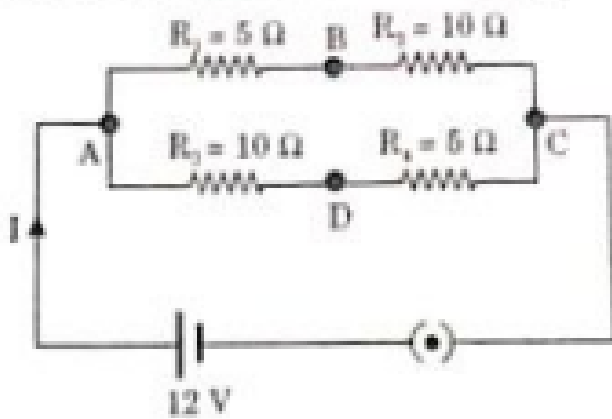
the total current drawn from the battery?



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292. Find

potential difference between B and C?



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293. Two resistors with resistance 5 ohm and 10 ohm respectively are to be connected to a battery of emf 6V so as to obtain:

maximum current

minimum current flowing

How will you connect the resistance in each case.



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294. Two resistors with resistance 5 ohm and 10 ohm respectively are to be connected to a battery of emf 6V so as to obtain:

maximum current

minimum current flowing

Calculate the strength of the total current in the circuit in the two cases.



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295. An electric lamp of 200 ohm and a toaster of 100 ohm are connected in parallel to a 220 V electricity source.

What will be resistance of an electric iron which when connected to the same electric source permits the same current as the total current flowing through both the appliances described above?



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296. An electric lamp of 200 ohm and a toaster of 100 ohm are connected in parallel to a 220 V electricity source.

What is the current passing through the electric iron?



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297. An electric lamp of 200 ohm and a toaster of 100 ohm are connected in parallel to a 220 V electricity source.

Calculate the powre of the electric iron.



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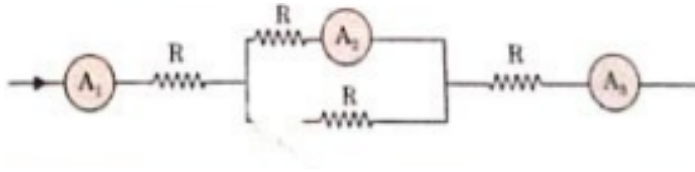
298. Draw diagram to show series and parallel combination resistors. State three salient features each of both the combinations.



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299. The statement that is most correct about the readings of ammeters A_1, A_2 and A_3

connected in the flowing circuit



A. $I_1 < I_2$

B. $I_3 < I_2$

C. $I_2 < I_3$

D. $I_1 = I_2$

Answer: $I_1 = I_3$



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300. Equivalent resistance of three resistors each of resistance of 2 ohm connected in series as determined experimentally should be

A. 4 ohm

B. 6 ohm

C. 9 ohm

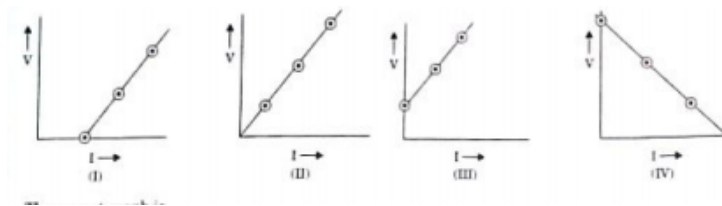
D. 2 ohm

Answer:



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301. Four students plot graphs between V and I , showing dependence of current I on potential difference V across a resistor, as shown



The correct graph is

A. I

B. II

C. III

D. IV

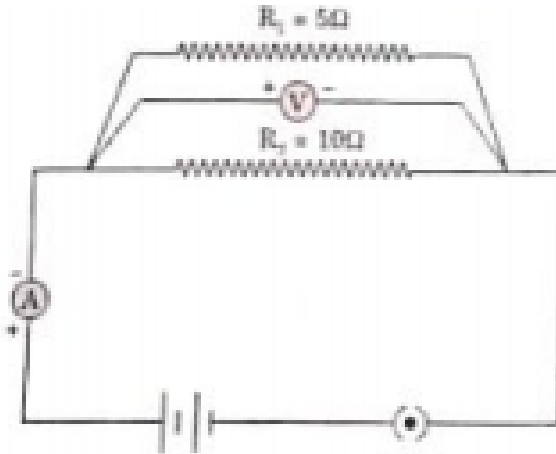
Answer:



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302. In the circuit given below, on plugging the key, the voltmeter reads 2.0 V but ammeter reads 0.6A. The resistance of the combination

is



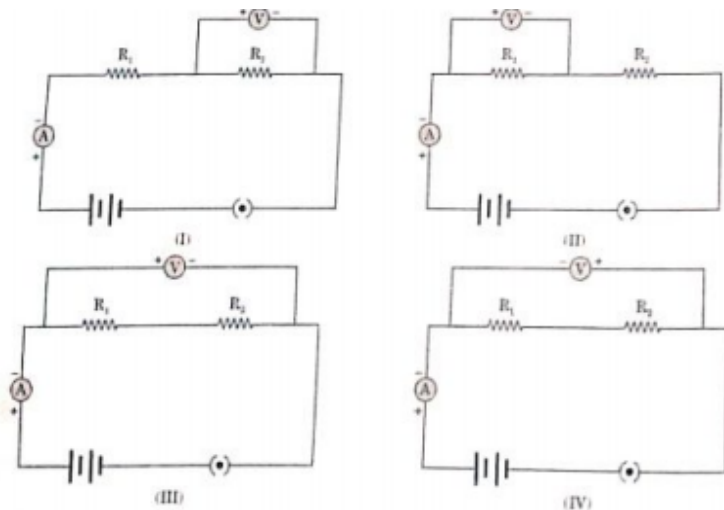
- A. 1.2 ohm
- B. 3.3 ohm
- C. 3.0 ohm
- D. 1.5 ohm

Answer:





303. In an experiment to find the equivalent resistance of two resistors connected in series, four circuits were set up as shown



The voltmeter has been correctly connected in the arrangement

A. I

B. II

C. III

D. IV

Answer:



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