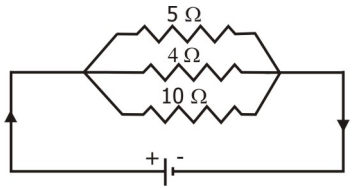
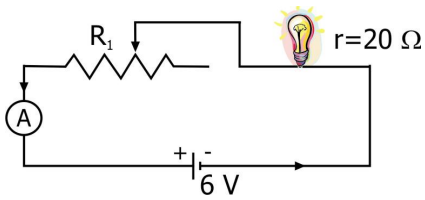
21. In the circuit diagram given here, the current flowing in 5 ohm resistor is 1 ampere. Find the current flowing through the other two resistors.

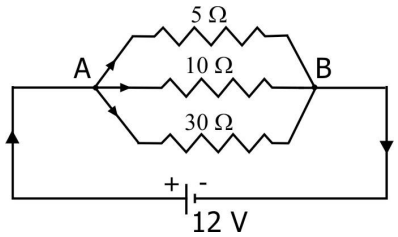


22. How will you connect three resistors of 2 Ω, 3 Ω and 5 Ω respectively so as to obtain a resultant resistance of 2.5 Ω? Draw the diagram to show the arrangement.

23. Suppose a 6-volt battery is connected across a lamp, whose resistance is 20 ohm, through a variable resistor as shown in fig. If the current in the circuit is 0.25 A, calculate the value of the resistance from the resistor which must be used.



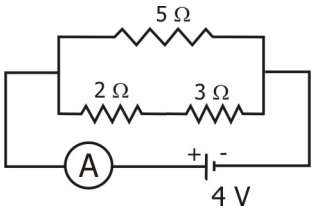
24. In the circuit diagram given in figure, calculate:
    (i) The current through each resistor,
    (ii) The total current in the circuit, and
    (iii) The total circuit resistance.



25. If you connect three resistors having values 2 Ω, 3 Ω and 5 Ω in parallel, then, will the value of the total resistance be less than 2 Ω, or greater than 5 Ω, or lie between 2 Ω and 5 Ω? Explain.
26. Five dry cells each of 1.5 volt have internal resistance of 0.2, 0.3, 0.4, 0.5 and 12 ohms. When connected in series, what current will these five cells furnish through 10 ohm resistance?

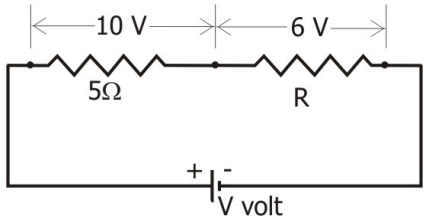
Problems on Combination of Resistances

1. If four resistances, each of value 1 ohm, are connected in series, what will be the resultant resistance?
2. A resistance of 6 ohms is connected in series with another resistance of 4 ohms. A potential difference of 20 volts is applied across the combination. Calculate the current through the circuit and potential difference across the 6 ohm resistance.
3. Calculate the equivalent resistance when two resistances of 3 ohms and 6 ohms are connected in parallel.
4. How should the two resistances of 2 ohms each be connected so as to produce an equivalent resistance of 1 ohm?
5. Three resistances of 12, 15 and 20 ohms are connected first in series and then in parallel. What is the equivalent (or combined) resistance in each case?
6. How can three resistors of 2, 3 and 6 ohms be connected in a circuit to give a total resistance of 1 ohm?
7. What possible values of resistance are get by combining two resistance, one of value 2 Ω and other 6 Ω?
8. If three resistances of 3 ohms each are connected in parallel, what will be their total resistance?
9. In the circuit diagram, find:
    (i) Total resistance
    (ii) Current shown by the ammeter A.

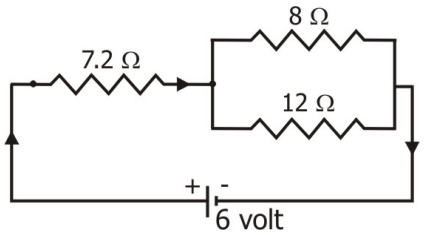


10. Two resistances when connected in parallel give resultant value of 2 ohm. When they are connected in series, the value becomes 9 ohms. Calculate the value of each resistance.

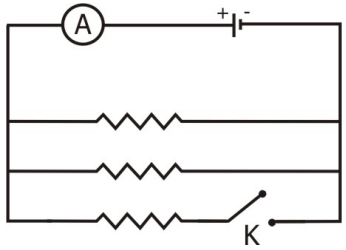
11. A resistor of 8 ohms is connected in parallel with another resistor X. the resultant resistance of the combination is 4.8 ohms. What is the value of the resistor X?
12. Two resistances are connected in series as shown in the fig.
    (i) What is the current through the 5 ohm resistance?
    (ii) What is the current through R?
    (iii) What is the value of R?
    (iv) What is the value of V?



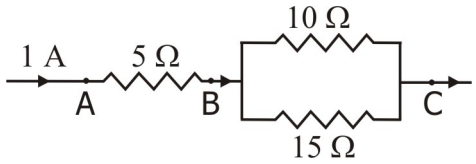
13. In the circuit diagram given here, find:
    (i) Total resistance of the circuit,
    (ii) Total current flowing in the circuit, and
    (iii) The potential difference across 7.2 Ω resistance.



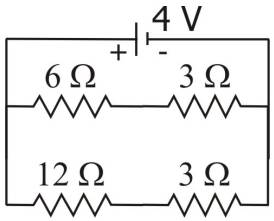
14. In the diagram, the cell and the ammeter both have negligible resistance. The resistors are identical. With the switch K open, the ammeter reads 0.6 A. What will be the ammeter reading when the switch is closed?



15. Three resistors are connected as shown in the diagram. Through the resistor 5 ohm, a current of 1 ampere is flowing.
    (i) What is the current through other two resistors?
    (ii) What is the p.d. across AB and across AC?
    (iii) What is the total resistance?



16. For the circuit shown in the following diagram, find the value of:
    (i) Current through 6 Ω resistor.
    (ii) Potential difference across 12 Ω resistor.



17. Two resistors X and Y are connected turn by turn: (i) in parallel, and (ii) in series. In which case the resultant resistance will be less than either of the individual resistances?
18. You are given three resistances of 1, 2 and 3 ohms. Show by diagrams, how with the help of these resistances you can get:
    (i) 6 Ω, (ii) 6/11 Ω, (iii) 1.5 Ω, (iv) 4/3 Ω, (v) 5/6 Ω, (vi) 11/5 Ω, (vii) 11/4 Ω, (viii) 11/3 Ω
19. Four resistances of equal value 1 ohm are given. Show by diagrams all different variations in which these four resistances can be connected. Calculate in each case the resultant resistance of the combination. In which case is the total resistance highest and in which it is lowest?

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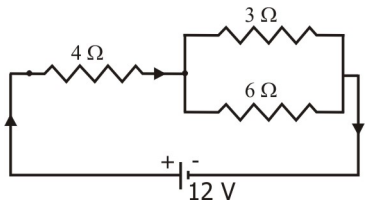
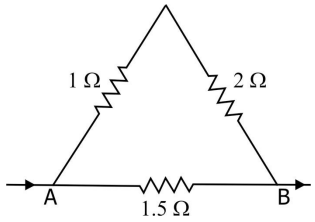
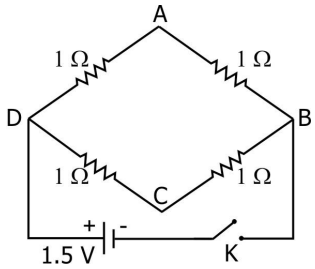
20. The circuit diagram here shows the combination of three resistors. Find:
    (i) Total resistance of the circuit.
    (ii) Total current flowing in the circuit.
    (iii) Potential difference across 4 Ω resistor.



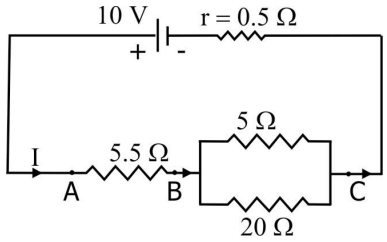
27. Calculate the effective resistance between the points A and B in the network shown here.



28. Calculate the effective resistance in the diagram shown in figure.

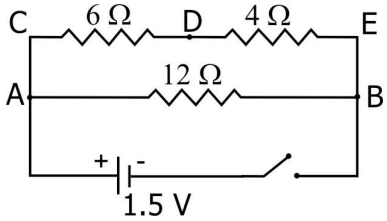


29. In the circuit given find the current through each resistor.



30. When two resistances are connected in series, their combined resistance is 25 ohms and when they are connected in parallel, their combined resistance is 4 ohms. Find their individual resistance.

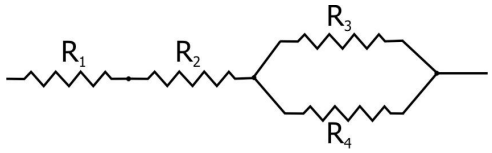
31. In the circuit shown in figure, calculate
    (i) The current flowing through the arms AB, AC and CDE.
    (ii) The potential difference across AB, CD and DE.



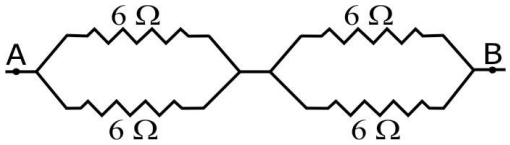
32. Four resistances of 16 ohms each are connected in parallel. Four such combinations are connected in series. What is the total resistance?

33. Six equal resistors of 1 Ω each are connected to form the sides of a hexagon ABCDEFG. Calculate the resistance offered by the combination if the current:
    (i) Enters at A and leaves at B.
    (ii) Enters at A and leaves at C.
    (iii) Enters at A and leaves at D.

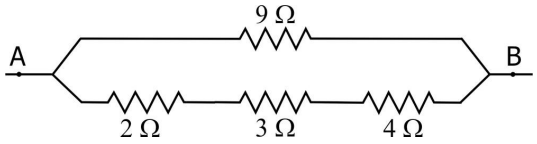
34. Calculate the equivalent resistance of the combination of resistances shown in figure.



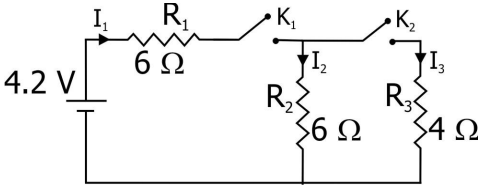
35. Calculate the effective resistance between the points A and B in the circuit shown in figure.



36. In the circuit shown here, calculate the equivalent resistance between the points A and B.



37. A circuit is set up as shown in figure. Calculate the current through and the potential difference across R_1, R_2 and R_3, when:
    (i) Keys K_1 and K_2 both are closed.
    (ii) Key K_1 is closed and K_2 is opened.
    (iii) Key K_1 is opened and K_2 is closed.



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