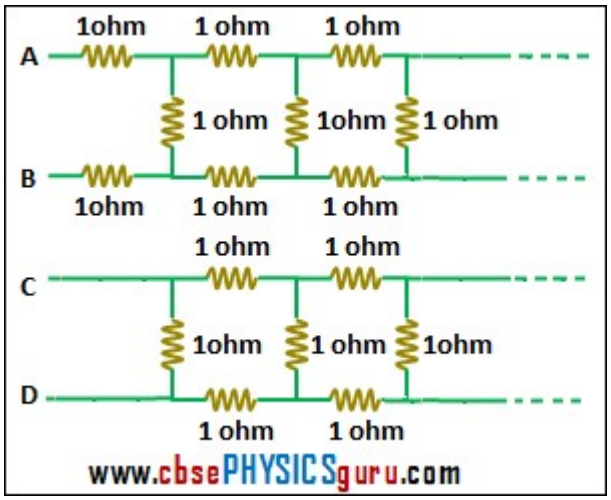
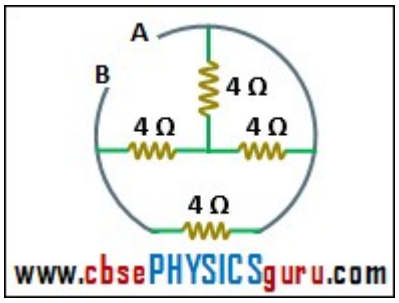
SERIES AND PARALLEL COMBINATION OF RESISTORS

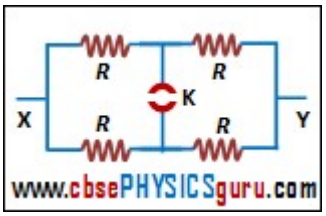
1. Three resistors draw currents of 2 A, 3 A and 6 A respectively when connected in turn across a battery. What will be the current drawn if these resistors are connected in series across the same battery?
   **(a)** 1 A (b) 2 A (c) 3 A (d) 11 A
2. In the two circuits shown in the figure:
   **(a)** $R_{AB} = \sqrt{3} + 1$, $R_{CD} = \sqrt{3} - 1$ (b) $R_{AB} = \sqrt{3} + 1$, $R_{CD} = \sqrt{3} + 1$ (c) $R_{AB} = \sqrt{3} - 1$, $R_{CD} = \sqrt{3} + 1$ (d) $R_{AB} = \sqrt{3} + 2$, $R_{CD} = \sqrt{3} + 1$



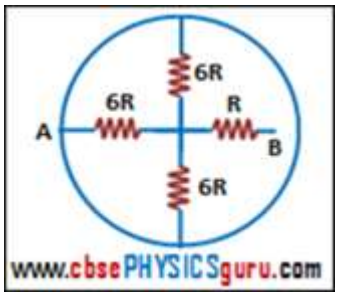

3. Four resistances each of 4 Ω are connected in the circuit as shown in figure. The equivalent resistance between A and B is:
   (a) 1.2 Ω **(b)** 2.4 Ω (c) 3.6 Ω (d) 6 Ω




4. What is the equivalent resistance between points X and Y in figure when the key K is (i) open (ii) closed?
   **(a)** R, R (b) R, R/2 (c) R/2, R/2 (d) 2R, R



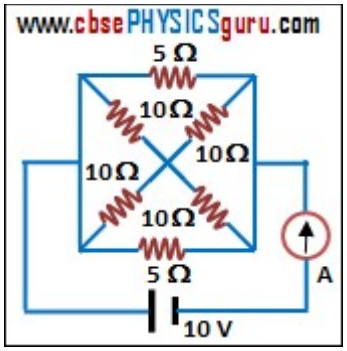

5. A circular ring of negligible resistance is used to connect four resistors of resistances 6R, 6R, 6R and R as shown in the figure. Find the equivalent resistance between points A & B.
   (a) R (b) 2R **(c)** 3R (d) 4R



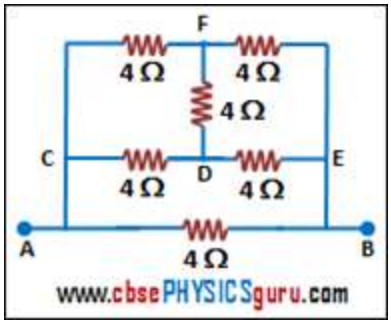

6. A wire of resistance 15 Ω is gradually stretched to double its original length. It is then cut into two equal parts. These parts are then connected, in parallel across a 3.0 volt battery. The current drawn from the battery is:

(a) 0.1 A **(b)** 0.2 A (c) 0.3 A (d) 0.4 A

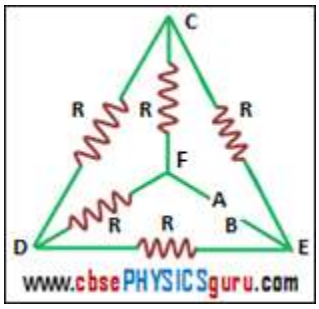
7. Calculate the current shown by the ammeter A in the circuit diagram shown in figure:
(a) 2 A (b) 4 A **(c)** 5A (d) 7 A



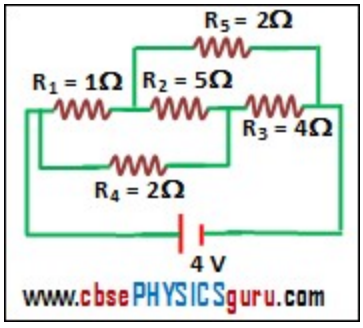

8. Six resistors, each of value 4Ω, are joined together in a circuit as shown in the figure. Calculate equivalent resistance across the points A and B:
**(a)** 2 Ω (b) 4 Ω (c) 8 Ω (d) 10 Ω



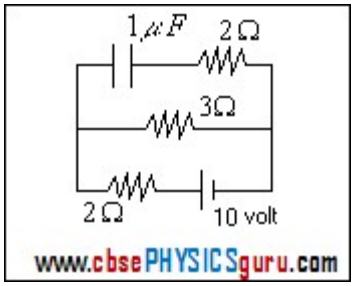

9. A potential difference of 2 volt is applied between the points A and B as shown in the network drawn in the figure. Calculate equivalent resistance of the network across the point A and B, and the magnitude of current flowing in the arms AFCEB. Given that R = 2 ohm:
**(a)** 2 Ω, 0.5A (b) 4 Ω, 0.5 A (c) 8 Ω, 1 A (d) 10 Ω, 2 A




10. Calculate the current drawn from the battery in the network shown in the figure exercise:
**(a)** 2 A (b) 4 A (c) 5A (d) 8 A

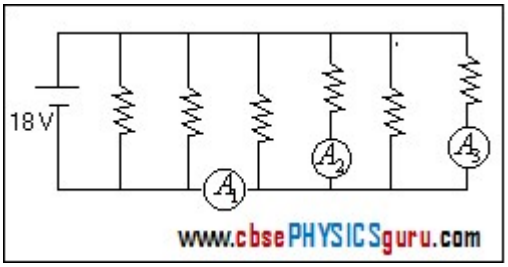



11. Potential difference across the capacitor in steady state will be:
(a) 2 V **(b)** 6 V (c) 8 V (d) 12 V

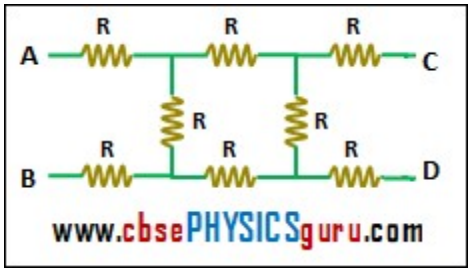


12. When a current of 0.5A is passed through two resistances in series, the potential difference between the ends of the series arrangement is 12.5V. On connecting them in parallel and passing the current of 1.5A, the potential difference between their ends is 6V, the two resistances are:
(a) 12 Ω, 13 Ω (b) 16 Ω, 9 Ω (c) 15 Ω, 10 Ω **(d)** 20 Ω, 5 Ω

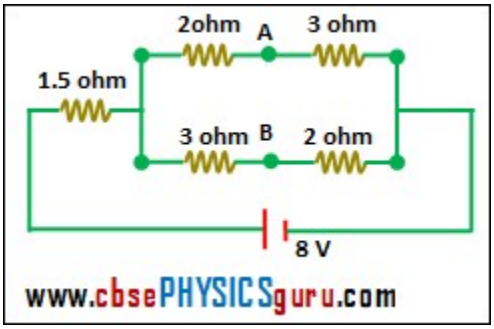
13. Six resistances each of 6Ω are connected to an 18 V battery as shown. The readings of ammeters $A_1$, $A_2$ and $A_3$ will be respectively:
**(a)** 12 A, 3 A, 3 A (b) 12 A, 9 A, 6 A (c) 3 A, 6 A, 9 A (d) 3 A, 6 A, 12 A



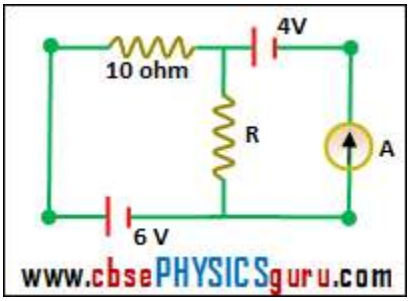

14. Figure shows a network of resistances. The ratio of the resistance between points A and C and that between A and D of the network is:
(a) 13: 14 (b) 4: 11 (c) 9: 11 **(d)** 11: 12




15. The potential difference between A and B is:
**(a)** 1 V (b) 2 V (c) 3 V (d) −1 V




16. The reading of the ammeter A is zero. The value of the resistor *R* is:
(a) 8 Ω (b) 10 Ω **(c)** 20 Ω (d) 40 Ω




17. Two resistances 3 Ω and 6 Ω are connected in parallel and a 4 Ω resistance is connected in series. The current through 3 Ω resistance is 0.8 A. Then the potential drop through 4 Ω resistance is:
(a) 9.6 V (b) 2.6 V **(c)** 4.8 V (d) 1.2 V

18. Two resistors of resistances 200 kΩ and 1 MΩ respectively form a potential divider with outer junctions maintained at potentials of +3 V and —15 V. Then, the potential at the junction between the resistors is:
**(a)** 0 V (b) +1 V (c) —12 V (d) + 12 V