

Current Electricity

Q1

In a conductor 6.25×10^{16} electrons flow from its end A to B in 2 s. Find the current flowing through the conductor ($e = 1.6 \times 10^{19}$ C)

Q2

A current of 1.6 mA flows through a conductor. If charge on an electron is -1.6×10^{-19} coulomb, find the number of electrons that will pass each second through the cross section of that conductor.

Q3

Find the potential difference required to pass a current of 0.2 A in a wire of resistance 20Ω

Q4

An electric bulb draws 1.2 A current at 6.0 V. Find the resistance of filament of bulb while glowing.

Q5

A car bulb connected to a 12 volt battery draws 2 A current when glowing. What is the resistance of the filament of the bulb? Will the resistance be more same or less when the bulb is not glowing?

Q6

Calculate the current flowing through a wire of resistance 5Ω connected to a battery of potential difference 3 V.

Q7

What length of copper wire of resistivity 1.7×10^{-8} m and radius 1 mm is required so that its resistance is 1 ?

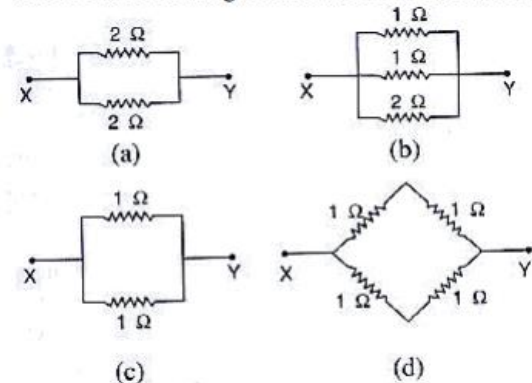
Q8

State how are the two resistors joined with a battery in each of the following cases when:

- (a) same current flows in each resistor
- (b) potential difference is same across each resistor
- (c) equivalent resistance is less than either of the two resistances
- (d) equivalent resistance is more than either of the two resistances.

Q9

Which of the following combinations have the same equivalent resistance between X and Y?



Q10

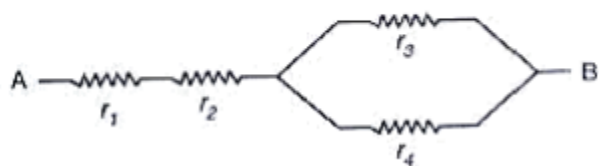
You have three resistors of values 2Ω , 3Ω and 5Ω . How will you join them so that the total resistance is less than 1Ω ? Draw diagram and find the total resistance.

Q11

Three resistors each of 2Ω are connected together so that their total resistance is 3Ω . Draw a diagram to show this arrangement and check it by calculation.

Q12

Calculate the equivalent resistance of the following combination of resistors r_1 , r_2 , r_3 and r_4 if $r_1 = r_2 = r_3 = r_4 = 2.0\Omega$, between the points A and B in Fig. 8.42



Q13

A combination consists of three resistors in series. Four similar sets are connected in parallel. If the resistance of each resistor is 2 ohm , find the resistance of the combination.

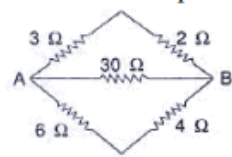
Q14

In the circuit shown below in Fig 8.43, calculate the value of x if the equivalent resistance between A and B is 4Ω .



Q15

Calculate the equivalent resistance between A and B in the adjacent diagram in Fig 8.46.



Q16

A resistor of 6Ω is connected in series with another resistor of 4Ω . A potential difference of 20 V is applied across the combination. Calculate (a) the current in the circuit and (b) the potential difference across the 6Ω resistor.

Q17

A particular resistance wire has a resistance of 3.0 ohm per meter . Find:

- The total resistance of three lengths of this wire each 1.5 m long, joined in parallel.
- The potential difference of the battery which gives a current of 2.0 A in each of the 1.5 m length when connected in parallel to the battery (assume that the resistance of battery is negligible)
- the resistance of 5 m length of a wire of the same material, but with twice the area of cross section.