Resistance parallel and series

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Resistance is the obstruction to the flow of electrons in a conductor. The unit of electrical resistance is the ohm.
Cause of resistance of a conductor: Resistance of a given conducting wire is due to the collisions of free electrons with the ions or atoms of the conductor while drifting toward the positive end of the conductor which in turn depends upon the arrangement of atoms in the conducting material (silver, copper, etc.) as well as on the length and thickness of the conducting wire.
Resistance is directly proportional to length and inversely proportional to area of cross section, temperature and number of free electrons in a unit volume.

Resistance in Series

If the components of a circuit are connected in series, there is only one possible pathway for the current, i.e. the components carry the same current. The total resistance equals the sum of individual resistances.

Resistance in Parallel

In this case, there are a number of alternative routes offered to the current. However, potential difference remains the same. It has been found by the application of Ohm's law that the largest resistance carries the smallest current and viceversa.
Hence, in a parallel combination, the reciprocal of equivalent resistance is equal to the sum of reciprocals of individual resistances.