Chapter-2 (The concept of Ammeter Shunt)

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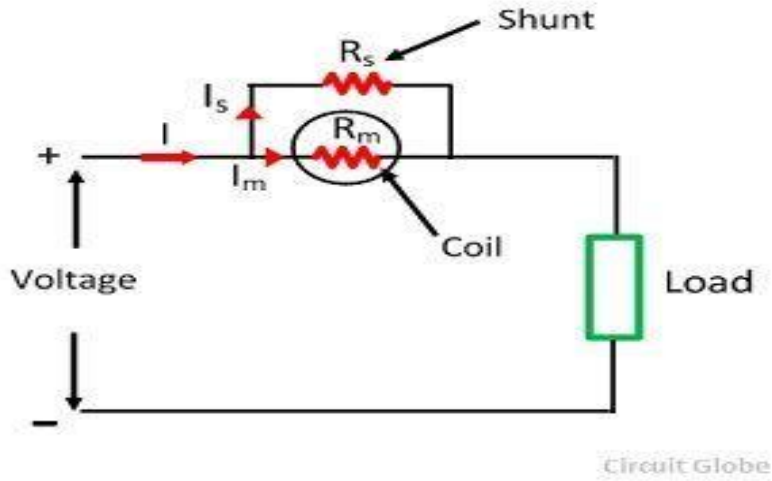
Introduction:

- An ammeter shunt is a very low-resistance connection between two points in an electric circuit that forms an alternative path for a portion of the current. Shunt voltage drop is used in conjunction with an ammeter to measure amperage of a circuit.

(Ammeter shunt for D.C. circuits) :

- A DC ammeter and shunt works in a similar way—a small amount of current that flows through the Main Wire is diverted to, and measured by, the Meter. ... Because the wires are fine, they carry only a very small current. Therefore, the current in the meter must be a tiny fraction of the total current to be measured.



As the shunt connects in parallel with the ammeter, thus the same voltage drop occurs between them, $I_{sh}R_{sh} = I_mR_m$

$$R_{sh} = \frac{I_mR_m}{I_{sh}}$$

The shunt current is

$$I_{sh} = I - I_m$$

Therefore the equation of shunt resistance is given as,

$$R_{sh} = \frac{I_mR_m}{I - I_m}$$

$$\frac{I}{I_m} - 1 = \frac{R_m}{R_{sh}}$$

$$\frac{I}{I_m} = 1 + \frac{R_m}{R_{sh}}$$

The ratio of the total current to the current requires the movement of the ammeter coil is called the multiplying power of the shunt.

The multiplying power is given as, $m = \frac{I}{I_m}$

The resistance of shunt becomes,

$$m = 1 + \frac{R_m}{R_{sh}}$$

$$R_{sh} = \frac{R_m}{m - 1}$$