

Answer on Question #61348-Physics-Electromagnetism

3 Kirchhoff's junction rule is statement of conservation of -----

- a) mass
- b) energy
- c) charge**
- d) momentum

Answer

Kirchhoff's junction rule states that at any junction in an electrical circuit, the sum of currents flowing into that junction is equal to the sum of currents flowing out of that junction. It means that the total charge coming into some junction is the same, as the charge coming out of it during some period. Therefore, this rule is statement of conservation of charge.

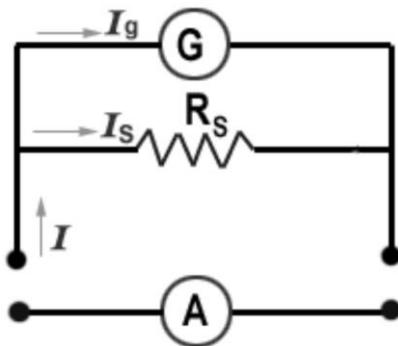
4) A galvanometer of resistance 120Ω a full scale deflection with a current of $0.0005A$. How would you convert it to an ammeter that reads a maximum current of $5A$?

- a) connect 2000Ω in parallel to it
- b) connect 200.12Ω in series to it
- c) connect 20.10Ω in series to it
- d) connect 0.012Ω in parallel to it**

Solution

Let resistance of galvanometer $R_g = 120\Omega$ and it gives full-scale deflection when current $I_g = 0.0005 A$ is passed through it. Then,

$$V_g = I_g R_g$$



Then current through shunt:

$$I_s = I - I_g$$

The potential difference across the shunt:

$$V_s = I_s R_s$$

$$V_s = (I - I_g)R_s = V_g$$

$$(I - I_g)R_s = I_gR_g$$

$$R_s = \frac{I_g}{I - I_g} R_g = \frac{0.0005}{5 - 0.0005} 120 = 0.012 \Omega$$