

Answer on Question #45714 – Physics – Electromagnetism

Question: Kirchhoff's junction rule is statement of conservation of

- a) mass;
- b) energy;
- c) charge;
- d) momentum.

Solution: 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. Mathematically one can state it as:

$$\sum_{k=1}^N I_k = 0.$$

Each current I_k has positive sign, if it flows into the junction and negative, if backwards. 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.

Answer:

- c) charge.