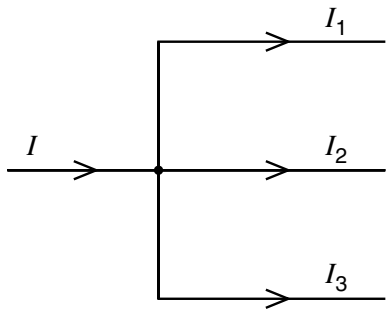
33 At a circuit junction, a current I divides into currents I_1, I_2 and I_3.



These currents are related by the equation

$$I = I_1 + I_2 + I_3.$$

Which law does this statement illustrate and on what principle is the law based?

A Kirchhoff's first law based on conservation of charge

B Kirchhoff's first law based on conservation of energy

C Kirchhoff's second law based on conservation of charge

D Kirchhoff's second law based on conservation of energy

34 The combined resistance R_T of two resistors of resistances R_1 and R_2 connected in parallel is given by the formula

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2}$$

Which statement is used in the derivation of this formula?

A The currents through the two resistors are equal.

B The potential difference across each resistor is the same.

C The supply current is split between the two resistors in the same ratio as the ratio of their resistances.

D The total power dissipated is the sum of the powers dissipated in the two resistors separately.