Definition:

"The fraction of the total current carried by an ion is known as transport number, transference number or Hittorf number may be denoted by sets symbols like t_+ and t_- or t_c and t_a or n_c and n_a".

From this definition, we get

$$t_a = \frac{\text{Current carried by an anion}}{\text{Total current passed through the solution}}$$

$$t_c = \frac{\text{Current carried by a cation}}{\text{Total current passed through the solution}}$$

So that $t_a + t_c = 1$.

Determination of transport number:

Transport number can be determined by Hittorf's method, moving boundary method, emf method and from ionic mobility.

Factors affecting transport number:

A rise in temperature tends to bring the transport number of cation and anion closer to 0.5

Transport number and Ionic mobility:

Ionic mobility or Ionic conductance is the conductivity of a solution containing 1 g ion, at infinite dilution, when two sufficiently large electrodes are placed 1 cm apart.

$$\text{Ionic mobilities } (\lambda_a \text{ or } \lambda_c) \propto \text{speeds of ions } (u_a \text{ or } u_c)$$

Units of ionic mobility are $Ohm^{-1}\ cm^2$ or $V^{-1}S^{-1}cm^2$

Ionic mobility and transport number are related as:

$$\lambda_a \text{ or } \lambda_c = t_a \text{ or } t_c \times \lambda_\infty$$

Absolute ionic mobility is the mobility the ion moves under unit potential gradient with. It's units are $cm\ sec^{-1}$.

$$\text{Absolute ionic mobility} = \frac{\text{Ionic mobility}}{96{,}500}$$