$$\Delta a_{mean} = \frac{|\Delta a_1| + |\Delta a_2| + |\Delta a_3| + \ldots\ldots\ldots + |\Delta a_n|}{n}$$

If we do a single measurement, the value we get may be in the range $a_{mean} \pm \Delta a_{mean}$.

This implies that any measurement of the physical quantity a is likely to lie between $(a_{mean} + \Delta a_{mean})$ and $(a_{mean} - \Delta a_{mean})$.

Relative Error/ Fractional Error/ Proportional Error:

The relative error is the ratio of the mean absolute error Δa_{mean} to the mean value a_{mean} of the quantity measured.

$$\text{Relative error} = \frac{\Delta a_{mean}}{a_{mean}}$$

Percentage Error

When the relative error is expressed in per cent, it is called the percentage error. Thus, Percentage error

$$\text{Percentage error} = \frac{\Delta a_{mean}}{a_{mean}} \times 100\%$$

IMPORTANT NOTE:

If we include the concept of significant figures, we should keep only first digit in the value of error and should drop all other digits by following proper method of rounding. After this the mean value of the quantity is also rounded from the position of error, following the concept of significant figures.