The least count of the meter rod is .1 cm. What is the permissible error in the length of the rod measured with it?

Solution:

Use the method of Kornfeld:

$$\Delta x = \frac{x_{max} - x_{min}}{2}, \Delta x - \text{permissible error}$$

$$x_{max} - x_{min} = 0.1\ cm$$

$$- the\ minimum\ difference\ between\ two\ measurements\ of\ length$$

permissible error:

$$\Delta x = \frac{x_{max} - x_{min}}{2} = \frac{0.001\ m}{2} = 0.0005\ m\ (0.05\ cm)$$

Calculate the relative error in measuring meter:

$$\varepsilon = \frac{\Delta x}{1\ m} * 100\% = \frac{0.0005\ m}{1\ m} * 100\% = 0.05\%$$

As we will measure a meter rod, the measurement accuracy is permissible.

Answer: 0.05 cm (0.0005 m).