

3.3 Laws of Transverse vibrations of stretched strings:

The frequency of vibration of the fundamental note of a stretched strings is

given by $n = \frac{1}{2l} \sqrt{\frac{T}{m}}$

T – tension

m- mass per unit length of string

i) Law of length:

The frequency of vibration of a stretched strings is inversely proportional to the length, when the tension and the mass per unit length of the string remain constant,

i.e: $n \propto \frac{1}{l}$ where T and m are constant

$nl = \text{constant}$

ii) Law of tension:

The frequency of vibration of a stretched strings is inversely proportional to the square root of tension. (l and m are constant)

$n \propto \sqrt{T}$

$\frac{n}{\sqrt{T}} = \text{constant.}$

iii) Law of mass:

The frequency of vibration of a stretched strings is inversely proportional to the square root of the mass per unit length. (T and l are constant)

$n \propto \frac{1}{\sqrt{m}}$

$n\sqrt{m} = \text{constant.}$