



OBSERVATIONS & CALCULATIONS

Constant mass suspended in the string = **2.5 kg**

Trial No.	Frequency of Tuning fork (n) Hz	Resonating length of sonometer wire			$K = n \times \ell$
		1 cm	2 cm	Mean (ℓ) cm	
1	512				
2	480				
3	426				

Mean value of K =Hz cm

To find unknown frequency of given tuning fork

Frequency of Tuning fork Hz	Resonating length of sonometer wire			Unknown frequency $n = \frac{K}{L}$ Hz
	1 cm	2 cm	Mean (L) cm	
unknown				

Frequency of the given tuning fork (n) = Hz

THE SONOMETER-1 (unknown frequency)

AIM

1. To verify $n \times \ell = \text{Const.}$
2. To determine frequency of the given tuning fork

APPARATUS

Sonometer, slotted weights, tuning fork of frequency -512 Hz, 480Hz, 426Hz & unknown frequency, rubber hammer, paper rider

THEORY

The frequency (n) of transverse vibrations produced in a stretched string is given by $n =$

$$\frac{1}{2\ell} \sqrt{\frac{T}{\mu}}$$

ℓ = resonating length of sonometer wire

T = tension in the string ($T=F=mg$ = weight hang on wire)

μ = linear density of wire (mass per unit length = $\frac{\text{mass of sonometer wire}}{\text{Length of sonometer wire}}$)

If T and μ are made as constants, then $n \times \ell = \text{constant (K)}$

If L is length of wire in resonance with tuning fork of frequency n , then $n = \frac{K}{L}$

PROCEDURE

The sonometer wire is stretched by suspending a constant mass = 2.5 Kg. The bridges are kept close and paper rider is placed at the middle. Tuning fork of frequency 512 Hz is excited and its stem is placed on the sonometer box. The bridges are moved slowly till the paper rider is thrown off. Distance between the bridges gives the resonating length ℓ . The experiment is repeated again and mean ℓ is determined

The same procedure is repeated by using the tuning forks of frequency 480Hz and 426Hz. $n \times \ell$ is found to be constant. Similarly resonating length L for the unknown frequency is determined and hence n is calculated.

RESULT

1. $n \times \ell$ is found to be constant
2. Frequency of the given tuning fork (n) = Hz