

## Comparative Study of Stretched Strings, Open Organ Pipe and Closed Organ Pipe

S. No.	Parameter	Stretched string	Open organ pipe	Closed organ pipe
(1)	Fundamental frequency or 1st harmonic	$n_1 = \frac{v}{2l}$	$n_1 = \frac{v}{2l}$	$n_1 = \frac{v}{4l}$
(2)	Frequency of 1st overtone or 2nd harmonic	$n_2 = 2n_1$	$n_2 = 2n_1$	Missing
(3)	Frequency of 2nd overtone or 3rd harmonic	$n_3 = 3n_1$	$n_3 = 3n_1$	$n_3 = 3n_1$
(4)	Frequency ratio of overtones	2 : 3 : 4...	2 : 3 : 4...	3 : 5 : 7...
(5)	Frequency ratio of harmonics	1 : 2 : 3 : 4...	1 : 2 : 3 : 4...	1 : 3 : 5 : 7...
(6)	Nature of waves	Transverse stationary	Longitudinal stationary	Longitudinal stationary