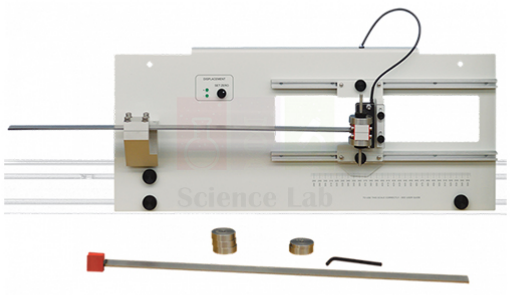
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Product Name :

Free Vibrations Of A Cantilever

Product Code :

SLE/ETM/06



Description :

Free Vibrations Of A Cantilever (Product Code: SLE/ETM/06) is a vibration experiment used to show how a clamped beam with an end mass oscillates like a mass-spring system, its own stiffness acting as the spring, in theory of machines laboratories. Students set the oscillating length with a sturdy clamp on a back panel that fixes to the Free Vibrations Test Frame, while a non-contacting sensor on two runners follows the tip without touching it. It is made by **Jain Scientific Equipments Pvt Ltd (ScienceLab)**, an OEM laboratory equipment manufacturer in India, at its own factory in Ambala.

Key Details

Parameter	Detail
System	One-degree-of-freedom free vibration; a beam with a mass at the end behaves like a mass-spring system, with beam stiffness replacing spring stiffness
Purpose	Examines what happens when the spring element is not light
Back panel	Fixes to the Test Frame; holds a sturdy clamp and two runners
Clamp	Holds the beam and is used to adjust the oscillating length of thecantilever
Sensor	Non-contacting sensor on the runners, measuring oscillations at the endof the cantilever with negligible damping
Topics	Simple harmonic motion (SHM) and frequency of oscillation; beam stiffness; Rayleigh's method; Dunkerley's method; second moment of area; phase difference between displacement and its derivatives
Real-world link	A visual example of oscillations that occur in real structures such as aircraft wings
Product code	SLE/ETM/06
Manufacturer	Jain Scientific Equipments Pvt Ltd (ScienceLab) — OEM
Country of origin	India (made in Ambala, Haryana)

What Is the Cantilever Vibration Experiment Used For?

A cantilever with an end mass is the simplest model of a structure that vibrates under its own stiffness, from a diving board to an aircraft wing. Students clamp the beam at a chosen length, deflect the tip and release it while the non-contacting sensor records the oscillation; repeating at several lengths shows how frequency falls as the cantilever gets longer. Measured frequencies are then compared with values predicted from the beam's stiffness and second moment of area.

Because the beam is not a light spring, its own mass affects the result, so the experiment is used to compare simple predictions with Rayleigh's method and Dunkerley's method, which account for distributed mass. The trace also shows the phase difference between displacement, velocity and acceleration. Tighten the clamp firmly at each new length, keep the sensor runners in line with t

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