

SYLLABUS for Practical laboratory : Waves & Oscillations.**Experiment DSC3- Waves & Oscillations**1. Experiments using **Bar pendulum**:

- Estimate limits on angular displacement for SHM by measuring the time period at different angular displacements and compare it with the expected value of time period for SHM.
- Determine the value of g using bar pendulum.
- To study damped oscillations using bar pendulum
- Study the effect of area of the damper on damped oscillations. Plot amplitude as a function of time and determine the damping coefficient and Q factor for different dampers

2. To determine the value of acceleration due to gravity using **Kater's pendulum** for both the cases

(a) $T_1 \sim T_2$ and (b) $T_1 \neq T_2$

Discuss the relative merits of both cases by estimation of error in the two cases.

3. Understand the **applications of CRO** by

- measuring voltage and time period of a periodic waveform using CRO.
- study the superposition of two perpendicular simple harmonic oscillations using CRO (Lissajous figures)

4. Experiments with **spring and mass system**

- To calculate g , spring constant and mass of a spring using static and dynamic methods.
- To calculate spring constant of series and parallel combination of two springs.

5. To study normal modes and beats in **coupled pendulums or coupled springs**.6. To determine the frequency of an electrically maintained tuning fork by **Melde's experiment** and to verify $\lambda^2 - T$ Law.7. To determine the current amplitude and phase response of a driven **series LCR circuit** with driving frequency and resistance. Draw resonance curves and find quality factor for low and high damping**Reference Books for Laboratory Work: Waves and Oscillations Lab**

1. *Advanced Practical Physics for students*, B. L. Flint and H. T. Worsnop, 1971, Asia Publishing House.
2. *Engineering Practical Physics*, S. Panigrahi and B. Mallick, 2015, Cengage Learning India Pvt. Ltd.
3. *Practical Physics*, G. L. Squires, 2015, 4/e, Cambridge University Press.
4. *A Text Book of Practical Physics*, Vol I and II, Prakash and Ramakrishna, 11/e, 2011, Kitab Mahal.
5. *An Introduction to Error Analysis: The study of uncertainties in Physical Measurements*, J. R. Taylor, 1997, University Science Books List of experiment