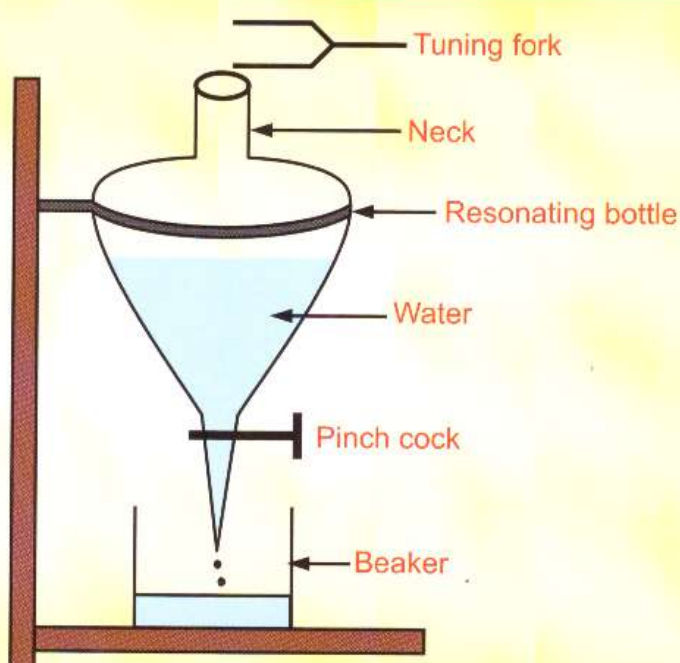


Shivaji University - B.Sc. Part-II

# PRACTICAL COURSE IN PHYSICS



Velocity of Sound by Resonating Bottle

**Dr. M. M. KARANJKAR**  
**C. J. KAMBLE**

**S. V. MALGAONKAR**  
**G. J. NAVATHE**

INTRODUCTION TO

# PRACTICAL COURSE IN PHYSICS

As Per New Revised Syllabus of Shivaji University,  
Kolhapur with Effect from June 2018

FOR

**B.Sc. Part II**

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**ISBN 978-93-88194-57-0**

**First Edition : August 2018**

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## PREFACE

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It is a matter of satisfaction to the authors in bringing out this book entitled "**Practical-Course in Physics for B.Sc.-II**". Realising the need of students and teachers the book is written in accordance with the requirements of syllabus of B.Sc.-II Practical of Shivaji University, Kolhapur.

It is our great pleasure to give this book, at the hands of students and teachers. The purpose of this practical book is to provide up-to-date study of various experiments. The presentation given in the book certainly guide the student in writing the journal.

All efforts have been made to use simple, accurate and scientific language throughout the book. Long teaching experience of the authors and a large number of source-books have helped in bringing the exactness in the book. Sufficient number of oral questions have been included at the end of each experiment to make it reasonably self sufficient. Honourable attempts have been made to present error free book. Yet some mistakes may have inadvertently crept in. Valuable suggestions from students, teachers are welcome for bringing out subsequent editions.

We are heartly thankful to Principal Dr. S. Y. Hongekar, Executive Secretary, Shri Swami Vivekanand Shikshan Sanstha Kolhapur, Mrs. Shubhangi Gavade, the secretary Shri Swami Vivekanand Shikshan Sanstha, Kolahpur, Dr. H. B. Patil Principal Vivekanand College Kolhapur, Dr. V. C. Mahajan Vivekanand College Kolhapur for inspiring us to write this book.

We are thankful to Nirali Prakashan Pune, for making us a part of their team of Authors. We thank Mr. Dineshbhai Furia and Shri Jigneshbhai Furia for their constant encouragement and publishing this book. We are very much thankful to Mr. Virbhaval Shinde, Marketing Executive Kolhapur and Mr. Ashok Nanaware Sangli, District Mr. Santosh Bare for typing, Mr. Kiran Velankar for Proof Reading and Mrs. Anjali Muley for drawing figures for their hearty cooperation.

Authors hope that this practical book will be of immense help and guidance for all students.

Authors

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# GROUP I

## GENERAL PHYSICS AND SOUND

### 1. $Y$ and $\eta$ by Searle's method

**Aim :**

To determine  $Y$ ,  $\eta$  and  $\sigma$  of the material of given wire by using Searle's method.

**Apparatus :**

Searle's apparatus, stop watch, thread, wires of different materials, etc.

**Diagrams :**

- (a) Flexural oscillations.  
 (b) Torsional oscillations.

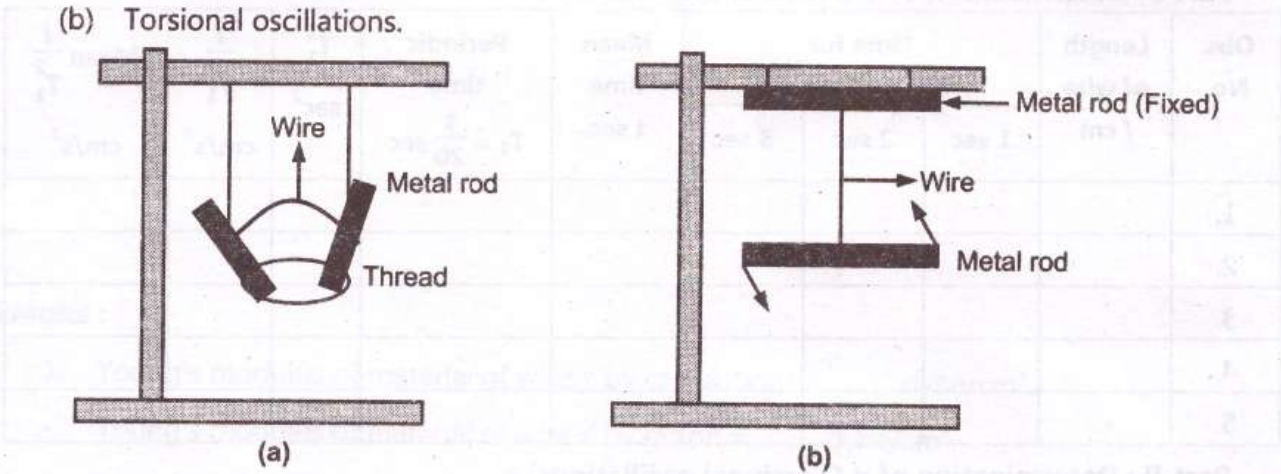


Fig. 1.1

**Formulae :**

$$(1) \quad Y = \frac{8 \cdot \pi \cdot I}{r^4} \times \left( \frac{l}{T_1^2} \right)_{\text{mean}}$$

$$(2) \quad Y = \frac{8 \cdot \pi \cdot I}{r^4} \times \text{Slope} \quad \text{and} \quad I = \frac{M [L^2 + B^2]}{12}$$

$$(3) \quad \eta = \frac{8 \cdot \pi \cdot I}{r^4} \times \left( \frac{l}{T_2^2} \right)_{\text{mean}}$$

$$(4) \quad \eta = \frac{8 \cdot \pi \cdot I}{r^4} \times \text{Slope}$$

where,

$L$  = Length of a rod

$B$  = Breadth of a rod

$Y$  = Young's modulus

$\eta$  = Modulus of rigidity

$T_1$  = Periodic time of flexural oscillations

$T_2$  = Periodic time of torsional oscillations

$I$  = M.I. of a rod

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