

2018  
Edition

## Physics 103 - Lab Manual



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# Phys 103 Lab Manual

**National Science Foundation (U.S.).  
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## Phys 103 Lab Manual:

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**SECTION A EXPERIMENTS**

- 1 To determine resistance per cm of a given wire by plotting a graph for potential difference versus current
- 2 To find resistance of a given wire using meter bridge and hence determine the specific resistance Resistivity of its material
- 3 To verify the laws of combination Series Parallel of resistance using ammeter bridge
- 4 To compare the e m f of two given primary cells using potentiometer
- 5 To determine the internal resistance of a given primary cell e g Leclanche cell using potentiometer
- 6 To determine the resistance of a galvanometer by half deflection method and to find its figure of merit
- 7 A To convert a given galvanometer of known resistance and figure of merit into an ammeter of desired range and to verify the same
- 7 B To convert a given galvanometer of known resistance and figure of merit into a voltmeter of desired range and to verify the same
- 8 To find the frequency of AC mains with a sonometer and horse shoe magnet

**SECTION B EXPERIMENTS**

- 1 To find the value of  $v$  for different values of  $u$  in case of a concave mirror and to find the focal length
- 2 To find the focal length of a convex lens by plotting graph between  $u$  and  $v$  or  $1/u$  and  $1/v$
- 3 To find the focal length of a convex mirror using a convex lens
- 4 To find the focal length of a concave lens using a convex lens
- 5 To determine the angle of minimum deviation for a given prism by plotting a graph between the angle of incidence and angle of deviation
- 6 To determine refractive index of a glass slab using a travelling microscope
- 7 To find the refractive index of a liquid by using a convex lens and a plane mirror
- 8 To draw I V characteristics curve of a p n junction in forward bias and reverse bias
- 9 To draw the characteristics curve of a zener diode and to determine its reverse break down voltage
- 10 To study the characteristics of a common emitter n p n or p n p transistor and to find out the values of current and voltage gains

**SECTION A ACTIVITIES**

- 1 To measure the resistance and impedance of an inductor with or without iron core
- 2 To measure resistance voltage AC DC current AC and check continuity of given circuit using multimeter
- 3 To assemble a household circuit comprising of three bulbs three on off

switches a fuse and a power source 4 To assemble the components of a given electrical circuit 5 To study the variation in potential drop with length of a wire for a steady current 6 To draw the diagram of a given open circuit comprising atleast a battery resistor rheostat key ammeter and voltmeter Make the components that are not connected in proper order and correct the circuit and also the circuit diagram

**SECTION B ACTIVITIES**

- 1 To study effect of intensity of light by varying distance of the source on an LDR Light Depending Resistor
- 2 To identify a diode a LED a transistor an IC a resistor and a capacitor from mixed collection of such items
- 3 Use a multimeter to i identify the transistor ii distinguish between n p n and p n p type transistor iii see the unidirectional flow of current in case of a diode and a LED iv Check whether a given electronic components e g diode transistor or IC is in working order
- 4 To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab
- 5 To observe polarisation of light using two polaroids
- 6 To observe diffraction of light due to a thin slit
- 7 To study the nature and size of the image formed by i convex lens ii concave mirror on a screen by using candle and a screen for different distance of the candle from the lens mirror
- 8 To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses

**SUGGESTED INVESTIGATORY PROJECT**

- 1 To Study Various factors on which the Internal Resistance EMF of a cell depends
- 2 To study the variations in current following in a circuit containing L D R because of variation a In the power of incandescent lamp used to illuminate the L D R Keeping all the lamps in fixed position b In the Distance of a incandescent lamp of fixed power used to illuminate the L D R
- 3 To find the refractive indices of a Water b Oil Transparent using a plane mirror an equiconvex lens made from a glass of known refractive index and an adjustable object needle
- 4 To design an appropriate logic gate combination for a given truth table
- 5 To investigate the relation between the ratio of i Output and Input voltage ii Number of turns in secondary coils and primary coils of a self designed transformer
- 6 To Investigate the dependence of angle of deviation on the angle of incidence using a hollow prism filled one by one with different transparent fluids
- 7 To Estimate the charge induced on each one of the two identical styrofoam balls suspended in a vertical plane by making use of Coulomb's Law
- 8 To study the factors on which the self inductance of a coil depends by observing the effect of this coil when put in series with a resistor bulb in a circuit fed up by an a.c source of adjustable frequency
- 9 To study the earth's magnetic field using a tangent galvanometer

**APPENDIX** Some Important Tables of Physical Constants Logarithmic and other Tables

Core Laboratory Manual of Physics for Class XI Anil Sharma, Prashant Sharma, Goyal Brothers Prakashan, 2020-04-16 Goyal Brothers Prakashan

A Laboratory Manual of Physics for Use in Secondary Schools Charles Elijah Linebarger, 1911

An Index to Undergraduate Science National Science Foundation (U.S.). Office of Experimental Projects and Programs, 1974

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1. Understanding the eBook Phys 103 Lab Manual
  - The Rise of Digital Reading Phys 103 Lab Manual
  - Advantages of eBooks Over Traditional Books
2. Identifying Phys 103 Lab Manual
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Phys 103 Lab Manual
  - User-Friendly Interface
4. Exploring eBook Recommendations from Phys 103 Lab Manual
  - Personalized Recommendations
  - Phys 103 Lab Manual User Reviews and Ratings
  - Phys 103 Lab Manual and Bestseller Lists
5. Accessing Phys 103 Lab Manual Free and Paid eBooks
  - Phys 103 Lab Manual Public Domain eBooks
  - Phys 103 Lab Manual eBook Subscription Services
  - Phys 103 Lab Manual Budget-Friendly Options
6. Navigating Phys 103 Lab Manual eBook Formats

- ePub, PDF, MOBI, and More
- Phys 103 Lab Manual Compatibility with Devices
- Phys 103 Lab Manual Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Phys 103 Lab Manual
  - Highlighting and Note-Taking Phys 103 Lab Manual
  - Interactive Elements Phys 103 Lab Manual
- 8. Staying Engaged with Phys 103 Lab Manual
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Phys 103 Lab Manual
- 9. Balancing eBooks and Physical Books Phys 103 Lab Manual
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Phys 103 Lab Manual
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Phys 103 Lab Manual
  - Setting Reading Goals Phys 103 Lab Manual
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Phys 103 Lab Manual
  - Fact-Checking eBook Content of Phys 103 Lab Manual
  - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
- 14. Embracing eBook Trends
  - Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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