

# PHYSICS

## LAB MANUAL

**CLASS  
XII**

**A Complete Lab  
Activity Book**

- Introduction
- Lab Experiment
- Viva Voce



# Arya Publications Lab Manual Class 12 Cbse Physics

**Er. Meera Goyal**



## **Arya Publications Lab Manual Class 12 Cbse Physics:**

*Core Laboratory Manual of Physics for Class XII* Anil Sharma, Prashant Sharma, 2020-04-16 Goyal Brothers Prakashan  
*Practical/Laboratory Manual Physics Class - XII -by Er. Meera Goyal (SBPD Publications)* Er. Meera Goyal, 2021-07-03 In accordance to the new syllabus of Central Board of Secondary Education CBSE New Delhi and other State Boards following CBSE Curriculum *CBSE Laboratory Manual Physics Class 12th* Er. Akash Shukla, 2022-12-13 Once Owen Chamberlain said The development of Physics like the development of any science is a continuous one It is a constant effort of NCERT that it puts on its textbooks to promote clearer understanding of concepts in every student As important as theoretical study is practical study is also essential to prove theories into realities The freshly updated edition of LABORATORY MANUAL Physics for class XII has been designed as a complete package to understand all the relevant Physics experiments in a simple lucid and interactive manner Strictly based on CBSE guidelines each experiment includes theory to give deep insights into each concept formula term definition etc Viva Voce questions Precautions Activities Diagrams and Appendices are accumulated to make concepts clearer in accordance with the curriculum Along with the experiments suggested Investigatory Projects will reveal the complete adherence of CBSE curriculum This book serves as a step by step guide for conducting experiments in such a way that students will not need to refer to any other book for explanations of the concepts An all inclusive guidance book for Physics laboratory experiment Coverage of each experiment in a simple and lucid manner Detailed and Step by Step procedure for each experiment Necessary precautions to be followed for the experiment Viva Voce Questions to get an understanding on the experiment Suggested Investigatory Projects of the CBSE curriculum Clearly labeled Diagrams in each experiment Appendices related to some useful data TABLE OF CONTENT General Introduction of Practical Work How to Record an Experiment Experimental Errors Logarithms Basic Trigonometry Study of Graphs Section A Experiments Activities Section B Experiments Activities Suggested Investigatory Projects Appendices *Physics Lab Manual Class XII According to the Latest CBSE Syllabus and Other State Boards Following the CBSE Curriculum* Edugorilla Prep Experts, 2022-08-18 The all new class 12 physics Lab Manual by Mr Pradeep Dwivedi is strictly based on the curriculum prescribed by CBSE State Boards of Chhattisgarh Haryana Bihar Jharkhand Kerala Mizoram Meghalaya and other state boards All the experiments in this Science Lab Manual have been given in a simple lucid and interactive manner The theory given with each experiment gives complete knowledge of each term concept and definition in order to provide a compact knowledge to the students at one place Viva Voce questions are given with each experiment to test students understanding of related experiments All the lab based experiments have well labeled diagrams which clearly demonstrate the details of the apparatus that are used the correct way of handling laboratory apparatus and perform the experiments methodically The basic purpose of this Lab Manual is to provide the students with appropriate guidance so that they can easily understand carry out and document the experiments in the Science Laboratory Some demonstration experiments are also included to illustrate principles and laws of

physics Illustrative diagrams have been used at the places where it is required The Lab Manual comes with practical lessons followed by lab experiments after each chapter projects and attached Notebook for jotting down all the essential information The aim of this Science Lab Manual is to help class 12 students to prepare and understand the complex physics concepts through experimental approach by utilizing pedagogically enhanced content of the Lab Manual and with a compact knowledge base for improving their analytical experimental skills and learning abilities Lab Manual-Physics-TB-11\_E-R1 Dr R K Gupta, Lab Manual Physics TB 11\_E R1 Lab Manual-Physics-TB-12\_E-R Dr R K Gupta, Lab Manual Physics TB 12\_E R *Practical/Laboratory Manual Physics Class - 12* Er. Meera Goyal, 2023-04-30 Sections A 1 Experiments 2 Activities Sections B 1 Experiments 2 Activities 3 Suggested Investigatory 4 Project Work **Physics 12 Laboratory Manual** WVU, Physics Staff, Wvu Physics, 1992-06-01 **Practical/Laboratory Manual Physics Class XII based on NCERT guidelines by Dr. Sunita Bhagia & Megha Bansal** Dr. J. P. Goel, Er. Meera Goyal, 2020-06-24 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 at least 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      *Physics Lab Manual Student Grd 12 2nd Edition* 182238,2005-02-25 The Student Laboratory Manual provides extensive laboratory exercises and experiments to reinforce concepts and stimulate interest in further studies

**Physics Grade 12 Student Lab Manual 3rd Edition** 259077,BJU Press,2010-03-01      Core Laboratory Manual of Physics for Class XI Anil Sharma,Prashant Sharma,Goyal Brothers Prakashan,2020-04-16 Goyal Brothers Prakashan      Lab Manual Latest Edition Dr. J. P. Goel,2016-12-17 Lab E Manual Physics For XIIth Practicals A

Every student will perform 10 experiments 5 from each section 8 activities 4 from each section during the academic year Two demonstration experiments must be performed by the teacher with participation of students The students will maintain a record of these demonstration experiments

**B Evaluation Scheme for Practical Examination** One experiment from any one section 8 Marks Two activities one from each section 4 4 8 Marks Practical record experiments activities 6 Marks Record of

demonstration experiments Viva based on these experiments 3 Marks Viva on experiments activities 5 Marks Total 30 Marks

**Section A Experiments**

- 1 To determine resistance per cm of a given wire by plotting a graph of potential difference versus current
- 2 To find resistance of a given wire using metre bridge and hence determine the specific resistance of its material
- 3 To verify the laws of combination series parallel of resistances using a metre bridge
- 4 To compare the emf of two given primary cells using potentiometer
- 5 To determine the internal resistance of given primary cells using potentiometer
- 6 To determine resistance of a galvanometer by half deflection method and to find its figure of merit
- 7 To convert the given galvanometer of known resistance and figure of merit into an ammeter and voltmeter of desired range and to verify the same
- 8 To find the frequency of the a c mains with a sonometer

**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 a given circuit using multimeter
- 3 To assemble a household circuit comprising 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 at least a battery resistor rheostat key ammeter and voltmeter Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram

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

**Activities**

- 1 To study effect of intensity of light by varying distance of the source on a L D R
- 2 To identify a diode a LED a transistor and IC a resistor and a capacitor from mixed collection of such items
- 3 Use of multimeter to i identify base of transistor ii distinguish between npn and pnp type transistors iii see the unidirectional flow of current in case of a diode and a LED iv check whether a given electronic component e g diode transistor or I C 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 polarization 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 a candle and a screen for different distances 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 Projects**

- 1 To investigate whether the energy of a simple pendulum is conserved
- 2 To determine the radius of gyration about the

centre of mass of a metre scale as a bar pendulum 3 To investigate changes in the velocity of a body under the action of a constant force and determine its acceleration 4 To compare effectiveness of different materials as insulators of heat 5 To determine the wavelengths of laser beam by diffraction 6 To study various factors on which the internal resistance emf of a cell depends 7 To construct a time switch and study dependence of its time constant on various factors 8 To study infrared radiations emitted by different sources using photo transistor 9 To compare effectiveness of different materials as absorbers of sound 10 To design an automatic traffic signal system using suitable combination of logic gates 11 To study luminosity of various electric lamps of different powers and make 12 To compare the Young's modulus of elasticity of different specimens of rubber and also draw their elastic hysteresis curve 13 To study collision of two balls in two dimensions 14 To study frequency response of i a resistor an inductor and a capacitor ii RL circuit iii RC circuit iv LCR series circuit

**Physics 12 :**

**Student Laboratory Manual** British Columbia. Physics 11/12 Curriculum Revision Committee, Somers, Ron, British Columbia. Schools Department. Curriculum Development Branch, 1994 *Introductory Physics* East Carolina University, 2012-08-10 Chemistry Lab Manual Class XII Follows the Latest CBSE Syllabus and Other State Board

Following the CBSE Curriculum. Edugorilla Prep Experts, 2022-07-05 Chemistry is all about conducting various experiments and having a deep study about them This deep analysis and study cannot solely be done with theories and practical experiments are necessary for better skill development of the students Considering this every year CBSE conducts the chemistry practicals in addition to the theory examinations This class 12 chemistry lab manual contains all the essential information that the students will require while commencing the practicals CBSE class 12th chemistry lab manual has been prepared strictly according to CBSE guidelines which follows the NCERT and other State Board curriculum All the experiments in this lab manual have been given in a simple lucid and interactive manner The theory given with each experiment gives complete knowledge of each term concept and definition in order to provide a compact knowledge to the students at one place Viva Voce questions are given with each experiment to test students understanding of related experiments Mr Kaushalesh Dwivedi is the author of this complete lab activity book for class 12 chemistry All the lab based experiments have well labeled diagrams which clearly demonstrate the details of the apparatus that are used the correct way of handling Laboratory apparatus and perform the experiments methodically The basic purpose of this lab manual is to provide the students with appropriate guidance so that they can easily understand carry out and document the experiments in the Science Laboratory The Lab Manual comes with practical lessons followed by Lab experiments after each chapter projects and Notebook for jotting down all the essential information The aim of this Science Lab Manual is to help class 12 students to prepare and understand the complex chemistry concepts through experimental approach by utilizing pedagogically enhanced content of the lab manual and with a compact knowledge base for improving their analytical experimental skills and learning abilities

**Physics 12 : Student Laboratory Manual** British Columbia. Division of Public

Instruction-Schools. Curriculum Development Branch, Somers, Ron, British Columbia. Physics 11/12 Curriculum Revision Committee, 1982      *Physics 174/184* Miami University, 2011-11-11      **Physics 121 Laboratory Manual, General Physics Laboratory I (Non-Calculus Treatment), Volume One** Marija Gajdardziska-Josifovska, 2005-01      Comprehensive Physics Activities Vol. I XII J. N. Jaiswal, Dr. Rajendra Singh, 2009-01-01



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## **Table of Contents Arya Publications Lab Manual Class 12 Cbse Physics**

1. Understanding the eBook Arya Publications Lab Manual Class 12 Cbse Physics
  - The Rise of Digital Reading Arya Publications Lab Manual Class 12 Cbse Physics
  - Advantages of eBooks Over Traditional Books
2. Identifying Arya Publications Lab Manual Class 12 Cbse Physics
  - 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 Arya Publications Lab Manual Class 12 Cbse Physics
  - User-Friendly Interface
4. Exploring eBook Recommendations from Arya Publications Lab Manual Class 12 Cbse Physics
  - Personalized Recommendations
  - Arya Publications Lab Manual Class 12 Cbse Physics User Reviews and Ratings
  - Arya Publications Lab Manual Class 12 Cbse Physics and Bestseller Lists
5. Accessing Arya Publications Lab Manual Class 12 Cbse Physics Free and Paid eBooks
  - Arya Publications Lab Manual Class 12 Cbse Physics Public Domain eBooks
  - Arya Publications Lab Manual Class 12 Cbse Physics eBook Subscription Services
  - Arya Publications Lab Manual Class 12 Cbse Physics Budget-Friendly Options
6. Navigating Arya Publications Lab Manual Class 12 Cbse Physics eBook Formats

- ePub, PDF, MOBI, and More
  - Arya Publications Lab Manual Class 12 Cbse Physics Compatibility with Devices
  - Arya Publications Lab Manual Class 12 Cbse Physics Enhanced eBook Features
7. Enhancing Your Reading Experience
- Adjustable Fonts and Text Sizes of Arya Publications Lab Manual Class 12 Cbse Physics
  - Highlighting and Note-Taking Arya Publications Lab Manual Class 12 Cbse Physics
  - Interactive Elements Arya Publications Lab Manual Class 12 Cbse Physics
8. Staying Engaged with Arya Publications Lab Manual Class 12 Cbse Physics
- Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Arya Publications Lab Manual Class 12 Cbse Physics
9. Balancing eBooks and Physical Books Arya Publications Lab Manual Class 12 Cbse Physics
- Benefits of a Digital Library
  - Creating a Diverse Reading Collection Arya Publications Lab Manual Class 12 Cbse Physics
10. Overcoming Reading Challenges
- Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
11. Cultivating a Reading Routine Arya Publications Lab Manual Class 12 Cbse Physics
- Setting Reading Goals Arya Publications Lab Manual Class 12 Cbse Physics
  - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Arya Publications Lab Manual Class 12 Cbse Physics
- Fact-Checking eBook Content of Arya Publications Lab Manual Class 12 Cbse Physics
  - 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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