


**LABORATORY MANUAL**

# Physics

## CBSE Class XII



**Experiments**  
**Activities**  
**Projects**  
**Viva-Voce**

# Cbse Physics Lab Manual 2015 Class 12 Ncert

**Marcel A. Müller**



## **Cbse Physics Lab Manual 2015 Class 12 Ncert:**

**EduGorilla's CBSE Class 12th Physics Lab Manual | 2024 Edition | A Well Illustrated, Complete Lab Activity book with Separate FAQs for Viva Voce Examination** EduGorilla Prep Experts, *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

**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 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

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**Physics : Textbook For Class Xii**, 2006-01-01 Lab Manual-Physics-TB-12\_E-R Dr R K Gupta, Lab Manual Physics TB 12\_E R

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content prepared by a team of educators writers editors and proofreaders CBSE Class XI Physics Lab Manual has properly labeled high diagrams and graphs A separate section on Viva Questions has been included to aid students in their Viva examination The Lab Manual explains the complex topics through detailed illustrations and lucid language making them simple to grasp Worksheets have been provided in CBSE Class 11th Physics Lab Manual for doing rough work Lab Manual-Physics-TB-11\_E-R1 Dr R K Gupta, Lab Manual Physics TB 11\_E R1 **Physics : Textbook For Class Xii** NCERT,2006-01-01 **Core Laboratory Manual of Physics for Class XI** Anil Sharma,Prashant Sharma,Goyal Brothers Prakashan,2020-04-16 Goyal Brothers Prakashan Practical/Laboratory Manual Physics Class XI based on NCERT guidelines by Dr. J. P. Goel & Er. Meera Goyal Dr. J. P. Goel ,Er. Meera Goyal,2020-06-24 SECTION A EXPERIMENTS 1 Measurement of Length 1 To measure the diameter of a small spherical cylindrical body by using a vernier callipers 2 To measure the dimensions of a given regular body of known mass using vernier callipers and hence find its density 3 To measure the internal diameter and depth of a given cylindrical vessel say calorimeter beaker by using vernier callipers and hence find its internal volume i e capacity Viva voce 2 Screw Gauge Micrometer 4 To determine the diameter of a given wire using a screw gauge and find its volume 5 To find the thickness of a given sheet with the help of screw gauge 6 To measure the volume of an irregular lamina by using a screw gauge Viva voce 3 Spherometer 7 To measure the radius of curvature of a given spherical surface convex lens by using a spherometer Viva voce 4 Mass and Weight 8 To determine the mass of two different objects using a beam balance Viva voce 5 Parallelogram Law of Vectors 9 To find the weight of a given body using parallelogram law of vectors Viva voce 6 Simple Pendulum Measurement of Time 10 Using a simple pendulum plot  $L$   $T$  and  $L$   $T^2$  graphs Hence find the effective length of a second s pendulum using appropriate graphs Viva voce 7 Friction 11 To study the relationship between force of limiting friction and normal reaction and to find the coefficient of friction between a block and a horizontal surface Viva voce 8 Motion of a Body Along an Inclined Plane 12 To find the downward force along an inclined plane acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination by plotting graph between force and  $\sin$  Viva voce SECTION B EXPERIMENTS 1 Elasticity 1 To determine the Young s modulus of elasticity of the material of the wire using Searle s apparatus Viva voce 2 Spring Constant 2 To find the spring constant of a helical spring by plotting load extension graph Viva voce 3 Boyle s Gas Law 3 To study the variation in volume with pressure for a sample of air constant temperature by plotting graphs between  $P$  and  $V$  and between  $P$  and  $1/V$  18 Viva voce 4 Surface Tension 4 To determine the surface tension of water by capillary rise method Viva voce 5 Viscosity 5 To determine the co effective of viscosity of given liquid by measuring the terminal velocity of a given spherical body in it Viva voce 6 Newton s Law of Cooling 6 To study the relationship between temperature of a hot body and time by plotting a cooling curv Viva voce 7 Vibrations of Strings 7 To study the relation between frequency and length for a given wire under constant tension using a sonometer Viva voce 8 To study the relation between the length of a given wire and tension for constant

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