

Physics Investigatory Project

Lab Manual-Physics-TB-11_E-R1

Contents: Introduction, Scope and Influence, Past Experience, Objectives and Aims, Teaching under Scheme, Methods of Teaching, Role of Teacher, Measurement and Evolution, Curriculum Development, Broadbased Curriculum, Enrichment of Controls, Planning the Lesson, Teaching Devices, Audio-Visual Aids, Role of Laboratory, A Rich Laboratory, New Trends, Place among other Discipline.

• **Strictly as per the Semester-2 syllabus for Board 2022 Exams (March-April) • Includes Questions of the both -Objective & Subjective Types Questions • Chapterwise and Topicwise Revision Notes for in-depth study • Modified & Empowered Mind Maps & Mnemonics for quick learning • Unit wise Self -Assessment Tests • Concept videos for blended learning • Previous Years' Board Examination Questions and Marking scheme Answers with detailed explanation to facilitate exam-oriented preparation. • Examiners comments & Answering Tips to aid in exam preparation. • Includes Topics found Difficult & Suggestions for students. • Includes Academically important Questions (AI) • Dynamic QR code to keep the students updated for 2022 Exam paper or any further ISC notifications/circulars**

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Core Laboratory Manual of Physics for Class XII

STEAM Play & Learn

Practical/Laboratory Manual Physics Class XI based on NCERT guidelines by Dr. J. P. Goel & Er. Meera Goyal

Methods Of Teaching Science

The method of teaching each subject play a pivotal role in enhancing the efficiency of their practitioners. Identifying the very importance of the methods of teaching and the quality of books, a series of books on the methods of teaching different subjects have been developed by experienced teacher educators for the benefit of teachers in s Role, Teaching Techniques, Methods of Vogue, Approaches in Vogue, Aims and Objectives of Teaching, Advancement of Science in India, Behaviour and Objectives, Educational Technology, Audio-visual Aids in Use, Experiments in Innovation, Programmes for Enrichment, Instruction in a Programmed Manner, Individual Level Instructions, Planning Curriculum (World), Textbook and Material Projects, Social Service.

Lab Manual

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 specifi resistance (Resistivity) of its material, 3.To verify the laws of combination (Series/Parallel) of resistance using ameter 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 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 μ in case of a concave mirror and to find the focal length, 2.To find between μ 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 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 function 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 at **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 as 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 ACTI** 1.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 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) c 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) 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 in a condense 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 refract 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 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 tangent galvanometer. **APPENDIX** Some Important Tables of Physical Constants Logarithmic and other Tables

Comprehensive Practical Physics XII

SBPD Publications

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Goyal's ISC Physics Question Bank with Model Test Papers for Class 12 Semester 2 Examination 2022 CISCE's Modified Assessment Plan for Academic Year 2021-22 Reduced and Bifurcated Syllabus for Semester-2 Examination Chapterwise Summary and Important Points *Chapterwise Question Bank having all varieties of expected Questions with answers for Semester-2 Examination to be held in March-April, 2022* Specimen Question Paper (Solved) for Semester-2 Examination issued by CISCE 5 Model Test Papers based on the latest specimen question paper issued by CISCE for Semester-2 Examination to be held in 'March-April, 2022' Goyal Brothers Prakashan **Science Teaching has evolved as a blend of conventional method and modern aids owing to the changing needs and techniques of education with an objective to develop scientific attitude among the students. This Fourth Edition of Innovative Science Teaching aims to strike balance between modern teaching methods and time-tested theories. FEATURES OF THE FOURTH EDITION • Chapters 3, 8 and 13 have been thoroughly revised and updated in the light of advancements of application of technology in teaching. • Chapter 13—New Technology to Promote Learning—has been expanded to include the impact of technology on teaching and learning. • E-learning materials and website addresses relevant to science teaching have been updated. • All chapters have been revised and extensive coverage of all aspects of modern teaching has been included. This edition of Innovative Science Teaching is designed for the undergraduate and postgraduate students of Education specializing in science teaching. It can also prove useful as a reference book for administrators, researchers and teacher-trainers. TARGET AUDIENCE • B.Ed (specialization in Science Teaching) • M.Ed (specialization in Science Teaching) • Diploma Courses in Education**

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Build an intuitive understanding of the principles behindquantum mechanics through practical construction and replication oforiginal experiments With easy-to-acquire, low-cost materials and basic knowledge ofalgebra and trigonometry, Exploring Quantum Physics throughHands-on Projects takes readers step by step through theprocess of re-creating scientific experiments that played anessential role in the creation and development of quantummechanics. Presented in near chronological order—from discoveries ofthe early twentieth century to new material onentanglement—this book includes question-andexperiment-filled chapters on: Light as a Wave Light as Particles Atoms and Radioactivity The Principle of Quantum Physics Wave/Particle Duality The Uncertainty Principle Schrödinger (and his Zombie Cat) Entanglement from simple measurements of Planck's constant to testingviolations of Bell's inequalities using entangled photons,Exploring Quantum Physics through Hands-on Projects not onlyimmerses readers in the process of quantum mechanics, it providesinsight into the history of the field—how the theories anddiscoveries apply to our world not only today, but alsoconceivably. By immersing readers in groundbreaking experiments that can beperformed at home, school, or in the lab, this first-ever, hands-onbook successfully demystifies the world of quantum physics for allwho seek to explore it—from science enthusiasts and undergraduates to practicing physicists and engineers.

Goyal Brothers Prakashan

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• It is strictly according to the latest CBSE guidelines

• It contains all NCERT Lab Manual Questions, fully solved

• It contains more than sufficient viva voce questions for practice

• It also includes brief description of each activity/experiment, which will help students in practicing and completing their lab work. *

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Class 12th CBSE Physics (10 Most Likely Question Papers with Solution) by Career Point Kota

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-T² 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 frequency using sonometer Viva-voce 8.Vibrations of Air Columns 9.To find the velocity of sound in air at room temperature using a resonance tube by two resonance position Viva-voce 9.Specific Heat 10.To determine specific heat of a given solid by the method of mixture 11.To determine the specific heat of a given liquid by method of mixture Viva-voce **SECTION : A ACTIVITIES** 1.To make a paper scale of given least count e.g., 0.2 cm, 0.5 cm and use it to measure the length of a given object. 2.To determine the mass of a given body using a metre scale and by applying principle of moments. Viva-voce 3.To plot a graph for a given set of data using proper choice of scales and error bars. Viva-voce 4.To measure the force of limiting friction for rolling of a roller on horizontal plane. Viva-voce 5.To study the variation in the range of a jet of water with angle of projection. Viva-voce 6.To study the conservation of energy of a ball rolling down on inclined plane (using a double inclined plane). Viva-voce 7. To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time. Viva-voce **SECTION : B ACTIVITIES** 1.To observe the change of the state and plot a cooling curve for molten wax. Viva-voce 2.To observe and explain the effect of heating on a bimetallic strip. Viva-voce 3.To note the change in level of liquid in a container on heating and interpret the observations. Viva-voce 4.To study the effect of detergent in surface tension by observing capillary rise. Viva-voce 5.To study the factors affecting the rate of loss of heat of a liquid. Viva-voce 6.To study the effect of load on depression of a suitably clamped meter scale loaded (i) at itsend (ii) in the middle. Viva-voce 7.To observe the decrease in pressure with the increase in velocity of the Fluid. Viva-voce **APPENDIX** Some Important Tables of Physical Constants Log-Antilog and other Tables

Some of the key benefits of studying from Oswaal Question Banks are: • Chapter-wise/ Topic-wise presentation for systematic and methodical study • Strictly based on the Reduced CBSE Curriculum issued for Academic Year 2020-2021, following the latest NCERT Textbook and Exemplar • Previous Years' Question Papers with Marking Scheme & Topper's Answers for exam-oriented study • Remembering, Understanding, Application, Analysing & Evaluation and Creation Based Question based on Bloom's Taxonomy for cognitive skills development • Latest Typologies of Questions developed by Oswaal Editorial Board included • Mind Maps in each chapter for making Learning simple • Most Likely Questions* generated by Oswaal Editorial Board with 100+ years of teaching experience • Suggested videos at the end of each chapter for a Hybrid Learning Experience **IMPORTANT FEATURES OF THE BOOK: Self-Study Mode • Chapter wise/Topic wise Previous Years' Board Examination Questions to facilitate focused study • Latest Board solved paper along with Marking Scheme and Handwritten Topper's Answers for practice Exam Preparatory Material • Answers of CBSE Marking Scheme up to March 2019 Exam with detailed explanations to score full marks in exams • Answering Tips & Commonly Made Errors for clearer thinking All-In-One • Revision notes, Mind Maps & Grammar charts facilitate quick revision of chapters • NCERT & Oswaal 150+ concept videos for digital learning**

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Oswaal ISC MCQs Chapterwise Question Bank Class 12 (Set of 6 Books) Physics, Chemistry, Maths, Biology, Eng-I (Lang) & Eng-II (Lit) (For Sem 1, 2021-22 Exam with the largest MCQ Question Pool)

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The CBSE has made certain changes in the assessment structure from the session 2019-20 onwards. In the new scheme of examination, CCE and term system has been replaced with the Internal Assessment & Single Annual Exam by CBSE itself. Single exam conducted by CBSE will carry 80 marks whereas 20 marks are left to the schools for internal assessment. CBSE has issued detailed guidelines on how the internal marks will be divided among different activities. From 2019 onwards, there will be internal choices in board examinations with increased internal options in the question paper. Considering this change, now a student has to prepare accordingly for board examinations. The new assessment format brought with it excitement as well as anxiety. And to help them prepare and excel in their CBSE board examination, Career Point Kota has developed a series of 10 Most Likely Question Papers with Solutions. The Key Features of Most Likely Question Papers with Solutions Series : New OBJECTIVE TYPE question in each paper. Syllabus of CBSE 2019-20. Based on the latest CBSE Syllabus & Pattern. Mind map of each chapter is given to visualize and help acquire a better understanding. Important terms, facts, formulae and quick revision tips are given. Covers questions asked in previous year board exams.

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STEAM Play & Learn is an introduction to STEAM topics (science, technology, engineering, arts, and math) for preschoolers with fun, interactive, easy-to-follow, step-by-step activities.

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Numerical Problems In Physics XII 2E

Physics Lab Manual

• Chapter wise and Topic wise introduction to enable quick revision. • Coverage of latest typologies of questions as per the Board latest Specimen papers • Mind Maps to unlock the imagination and come up with new ideas. • Concept videos to make learning simple. • Latest Solved Paper with Topper's Answers • Previous Years' Board Examination Questions and Marking scheme Answers with detailed explanation to facilitate exam-oriented preparation. • Examiners comments & Answering Tips to aid in exam preparation. • Includes Topics found Difficult & Suggestions for students. • Dynamic QR code to keep the students updated for 2021 Exam paper or any further CISCE notifications/circulars

• **Topper's Answer Sheet** as released by CBSE to understand the scoring technique. We hope this book will gratify students' need for the new CBSE pattern board exam and smoothen their path to success. We wish to utilize the opportunity to place on record our special thanks to all the members of the Content Development team for their efforts to create this wonderful book.

• All Sample Papers are based on the latest CBSE Sample Question Paper 2021 released on 9th October 2020. Circular No.: Acad - 77/2020. • Solution of CBSE Sample Question Paper 2021 and 10 Sample Papers are given. • 10 Unsolved Sample Papers and CBSE Examination Paper 2020 are given for solutions of these papers by scanning the QR Code given at the back of the book. • Assertion - Reason Questions and Case-based/Passage-based Questions are inserted at proper places in every Sample Papers.

• Strictly as per the new Semester wise syllabus for Board Examinations to be held in the academic session 2021-22 for class -12 • Largest pool of Topic wise MCQs based on different typologies • Answer key with explanations • Revision Notes for in-depth study • Mind Maps & Mnemonics for quick learning • Concept videos for blended learning • Includes Topics found Difficult & Suggestions for students. • Dynamic QR code to keep the students updated for 2021 Exam paper or any further CBSE notifications/circulars

Investigatory Projects in Physics

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Proceedings of the International Conference on the Role of Laboratory in Physics Education, Jaipur, India, December 29, 1983-January 2, 1984