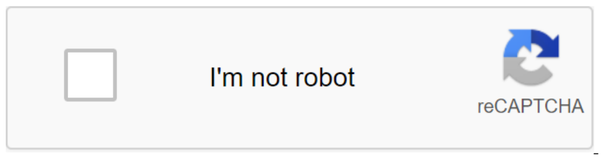

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Ballistic galvanometer nptel pdf

Definition: The galvanometer used to estimate the amount of charge flow through it is called a ballistic galvanometer. The principle of the ballistic galvanometer is very simple. This depends on the deviation of the coil, which is directly proportional to what the charge passes through it. The galvanometer measures most of the charge passes through it despite the current. The ballistic galvanometer design of the Ballistic Galvanometer consists of a coil of copper wire, which is wound on the non-wire frame of the galvanometer. Phosphorus bronze suspends the coils between the north and south poles of the magnet. To increase the magnetic flow, the iron core is placed in a coil. The lower part of the coil is connected to the spring. This spring restores the torque of the coil. When the charge passes through the galvanometer, their coil starts to move and receives a pulse. The pulse of the coil is proportional to the charges that pass through it. The actual reading of the galvanometer is achieved by coil having a high moment of inertia. The moment of inertia means that the body resists the angular movement. If the coil has a high moment of inertia, then their fluctuations are great. Thus, you get an accurate reading. The ballistic galvanometer theory consider a rectangular coil with N number of turns placed in a single magnetic field. Let me be length and be the width of the coil. The coil area is given as When the current passes through the coil, the torque acts on it. This expression determines the value of the torque. Let the current flow through the coil for a very short duration says dt, and this is expressed as If the current passing through the coil within t seconds, the expression becomes q be the total charge running through the coil. The moment of inertia of the coil is given I, and the angular speed through q. The expression gives the angular momentum of the coil Corner pulse of the coil equals the force acting on the coil. So out of the equation (4) and (5), we get. Kinetic energy (K) deflects the coil through the angle of the θ, and this deviation is restored through the spring. The coil's torque is equal to their deviation. Thus, the periodic oscillation of the coil is given as the by multiplying the equation (7) from the aforementioned equation we get to replace the value of the equation (6) in the equation (8) we get K is a constant ballistic galvanometer. Calibration of the Galvanometer Calibration galvanometer is the process of determining its constant value through practical experiments. Below are the methods used to determine the constant of ballistic galvanometer. Using the Capacitor Charging and unloading the capacitor gives the ballistic galvanometer values permanent. Teh location for calibrating the ballistic galvanometer using the capacitor is shown in the picture below. The circuit uses two S switch poles and an unknown EMF E source. Similarly, when the switch connects to Terminal 1, the capacitor becomes discharged through the resistor R, connected in a series with a ballistic galvanometer. The cot discharge of the capacitor deflects the ballistic galvanometer coil through the angle of the θ. The formula calculates the contience of the galvanometer by means of a reciprocal induction of the ballistic galvanometer continuum determines through mutual induction between the coils. The location of the ballistic galvanometer requires two coils; primary and secondary. The primary coil is energized, knowing the source of the voltage. Due to mutual induction, current induces in the secondary chain. And this current is used to calibrate the ballistic galvanometer. Ballistic galvanometer is a type of sensitive galvanometer; usually a mirrored galvanometer. Unlike the tone-measuring galvanometer, the moving part has a big moment of inertia, thus giving it a long period of oscillation. It really is an integrator measuring the amount of charge discharged through it. It can be either a moving coil or a moving type of magnet. Ballistic galvanometer calibration. Grassot fluxmeter, a form of ballistic galvanometer. The Calibration circuit of the Grassot fluxometer using standard mutual induction and a known amount of electrical discharge. Measuring the installation is similar. Before the first use, it is necessary to determine the ballistic constant of the galvanometer. This is usually done by connecting a known capacitor charged to a known voltage to the galvanometer and recording the deviation. Permanent K is calculated from the C, V voltage and deviations of D: K q C V /d 'displaystyle K'CV/d, where K is expressed in pendants by a centimeter. In operation, an unknown amount of charge (in pendants) is simple: Grassot Fluxmeter The Grassot Fluxmeter solves a particular problem faced by conventional galvanometers. For a normal galvanometer, the discharge time should be shorter than the natural period of oscillation of the mechanism. In some applications, especially with inductors, this condition cannot be met. The Grassot fluusometer solves this problem by acting without any regenerative force, making the period of oscillation virtually infinite and thus longer than any discharge time. Its design is similar to a ballistic galvanometer, but its coil is suspended without any regenerative forces in the strands of suspension or in current wires. The core (bobbin) of the coil has an unsive material. When an electric charge is connected to an instrument, begins to move in the magnetic field of the galvanometer magnet, generating opposing electromotive forces and comes to a stop regardless of the time of the current flow. Changing the position of the coil is proportional only to the amount of charge. The coil returns to zero by hand or by reversing the direction of the current. Wikimedia Commons links has media related to ballistic galvanometers. Earl Terry, advanced laboratory practice in the field of electricity and magnetism. McGraw-Hill, New York 1929 Page 24-34 Electrical Tools, Taylor-Cambridge, Cambridge Science Instrumentation Company, Trade Catalog, 1908 Page 34 Electrical Dimensions and U.A.BAKSHI Technical Publications Tool Extracted from This is a basic course for all UG electrical engineering students. The content of this course is also aligned with the GATE EE exam curriculum. The course has two halves: (1) Electrical measurements (6 weeks): The principle of operation and dynamics of various electromechanical instruments, ammeter, voltmeter, ometer, wattmeter, energy meter, measurement of resistance and intransigence, bridges and potentiometers, instrument transformers. (2) Electronic Tools (6 weeks): Differential amplifier, op amplifiers, ANALOG and AC analog tools, ADC and DAC, digital tools, feature generator, oscilloscope Find out more information below INTENDED AUDIENCE: Mostly electrical engineering, Instrumentation Also interested students from electronics, physics and similar disciplines PREREQUISITES: Basic Principles of Electrical Engineering (Chain Theory), Basic Digital and Analog ElectronicsINDUSTRY SUPPORT: Must for Electricity Generation Industry, Electrical Distribution Industry, Electronics Industries are also highly needed for the automotive industry, rail, aerospace, industry Total Page 87 Downloaded 7 months ago Sl.No Chapter Title MP4 Download 1Lecture 01: PMMC Tools (Basic)Download2Lecture 02: Electrodynamic Tool (basic)Download3Lecture 0 Demonstration of PMMC and Electrodynamic Instruments (additional practical demonstration)Download4Lecture 04: FEATURES of PMMC and Electrodynamic Instruments (basic)Download5Lecture 05: Moving iron instruments (basic)Download6Lecture 06 : Demonstration of moving iron instruments (additional practical demonstration)Download7Lecture 07: Electrostatic instrument (basic)Download8Lecture 08: Display of torque deviation in electrodynamic, electrostatic and moving iron instrument (additional advanced theme) Download9Lecture 09: Damping and Eddie Current Damping 10: Dynamics of moving coils and damping (basic)Download11Lecture 11: Dynamics of moving and damping (Contd.) 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(Basic) Download47Lecture 47: Background: From flip flops to counters - I (Basic)Download48Lecture 48: Background: From flip flop to counters - IIDownload49Lecture 49: Background: Operational Amplifiers - I (main)Download50Lecture 50: Background: Background: Operational Amplifiers - II (Basic)Download51Lecture 51 Background: Operational Amplifiers - III (Basic)Download52Lecture 52: Background: Operational Amplifiers - IV (Basic)Download53Lecture 53: Amplifier Inverting compared to Schmitt Trigger (additional)Download54Lecture 54 : Non-inverting amplifier vs. Schmitt Trigger (Additional)Download55Lecture 55 : Difference Amplifier - I 56: Difference Amplifier - IIDownload57Lecture 57: Difference Amplifier - III (basic)Download58Lecture 58: Digital Frequency Meter (basic)Download59Lecture 59: Digital frequency meter Trigger (additional)Download61Lecture 61: Schmitt Trigger (Basic)Download62Lecture 62: Digital Frequency Meter (Basic)Download63Lecture 63: Linear Ramp-type digital voltmeter (basic)Download64Lecture 64: Double tilt digital voltmeter - I (Basic)Download65Lecture 65: Double tilt Digital Voltmeter - II (Basic)Download66Lecture 66: Double tilt digital voltmeter and circuit integratorDownload67lecture 67: Digital voltage-type ramp (basic)Download68Lecture 68: Digital voltage-type ramp and sequential approximation of voltage type Download69Lecture 69 : ADC and DAC - I (Main)Download70Lecture 70: ADC and DAC - IIDownload71Lecture 71 : Why we need electronic toolsDownload72ureure 72 : Tools with amplifiers based on op-amplifier - IDownload73Lecture 73 : Tools with amplifiers based on op-amplifier - IIDownload74Lecture 74 : Tools with amplifier-based amplifiers - IIDownload74Lecture 74 : Tools with amplifiers based on op-amp - IIDownload74Lecture 74 : Tools with amplifiers based on op-amplifier - IIILectdown75Lecture 75 : AmplifierDownload76Lecture 76 : Functional Load Generator777Lection 77: 555-Timer chainDownload78Lecture 78: Astable and monostilement oscillator SchemesDownloadloadload79Lecture 79: Pulse GeneratorDownload80Lecture 80: Oscilloscope - iDown81Lecture 81Lecture : Osilloscope Download82Lecture 82: Beamer follower voltmeterDownload83Lecture 83: Linear ohmmeterDownload84Lecture 84: RampDown generatorload Sl.No Language Link Book 1EnglishNot2BengaliNot Available3GujaratiNot Available4Not Available5KannadaNot Available 6MalayalamNot Available 7. ballistic galvanometer nptel pdf