SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A++ Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME: 23EET206/ Measurements and Instrumentation

II YEAR / IV SEMESTER

UNIT 3 - ELECTRICAL AND ELECTRONIC MEASUREMENTS

Topic 1 – Measurements of voltage, current: Moving coil and moving Iron instruments

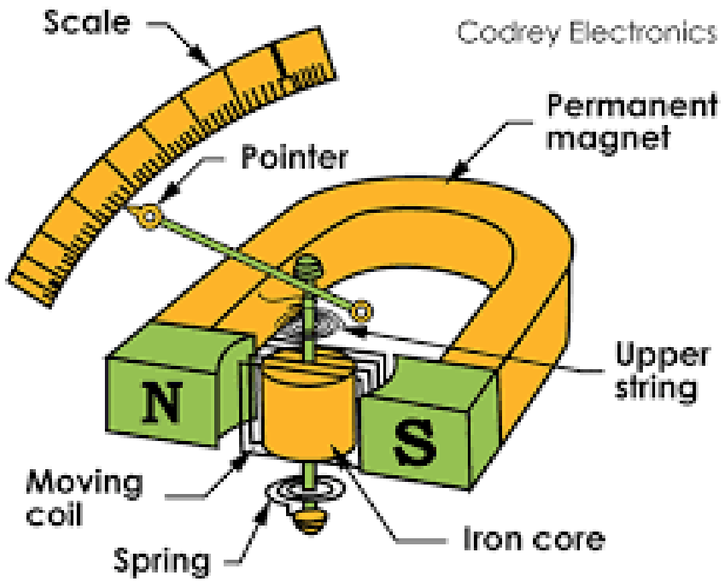
SUCCESSFUL STUDENT

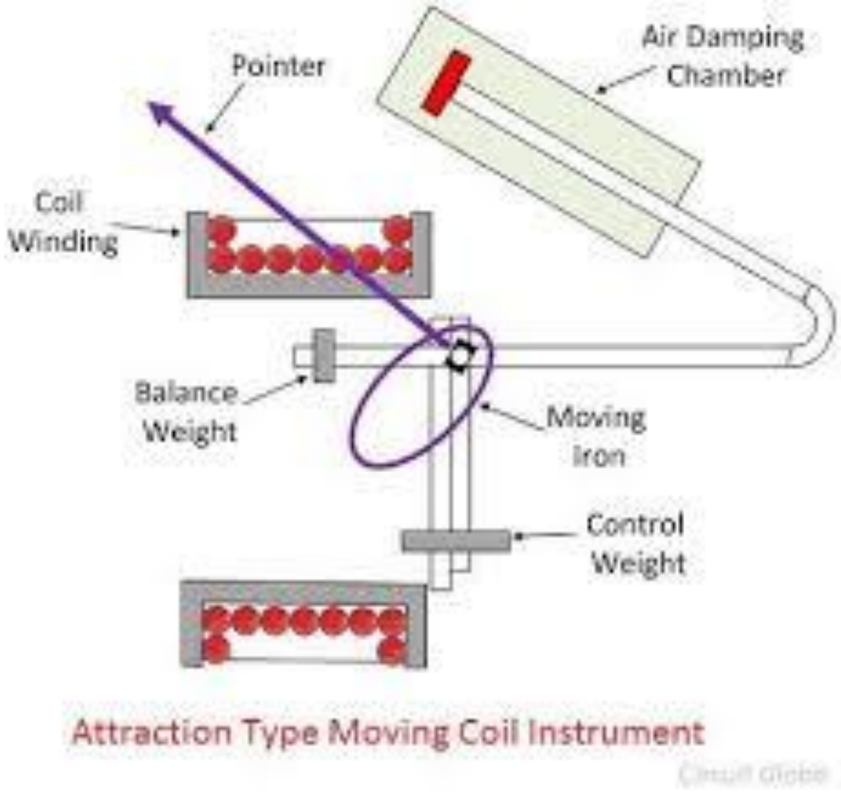
Positive Attitude

Professionally Groomed

Socially Interactive

Technically Skillful



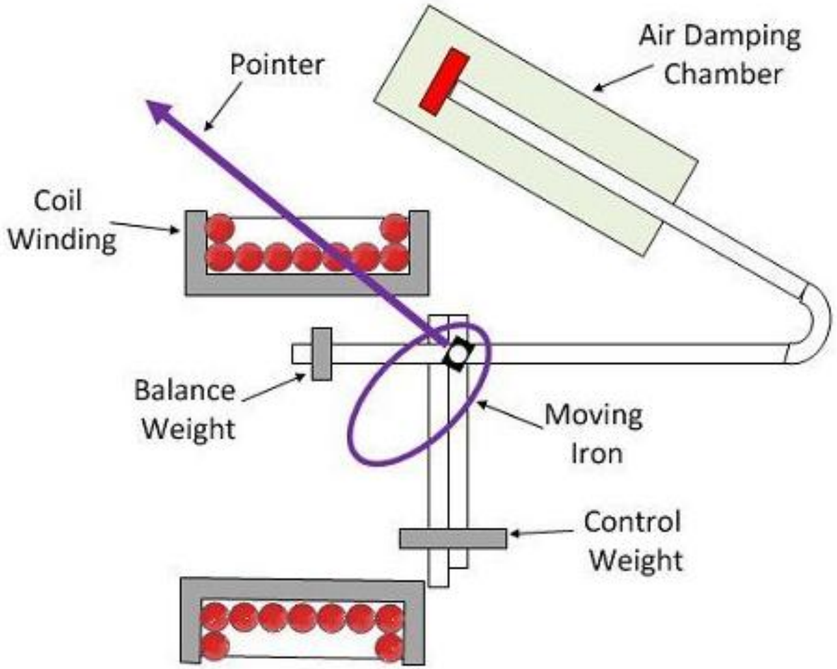


Attraction Type Moving Coil Instrument

Moving Iron or MI Instrument

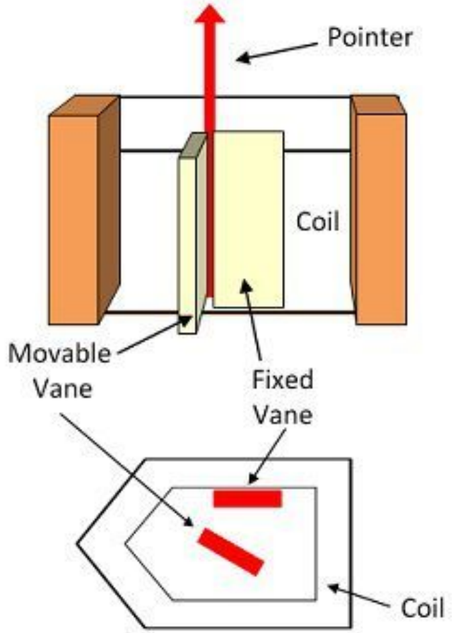
Definition: The **instrument** in which the **moving iron** is used for **measuring** the flow of **current or voltage** is known as the moving iron instrument. It works on the **principle** that the **iron place** near the **magnet attracts towards** it. The **force of attraction** depends on the **strength** of the **magnet field**. The magnetic field induces by the electromagnet whose strength depends on the magnitude of the current passes through it.

Construction of Attraction Type Instrument – The stationary coil of the attraction type instrument is flat and has a narrow opening. The moving element is the flat disc of the iron core. The current flow through the stationary coil produced the magnetic field which attracts the iron coil.



Attraction Type Moving Coil Instrument

2. Repulsion Type Instruments – The repulsion type instrument has two vanes or iron plates. One is fixed, and the other one is movable. The vanes become magnetised when the current passes through the stationary coil and the force of repulsion occur between them. Because of a repulsive force, the moving coil starts moving away from the fixed vane.



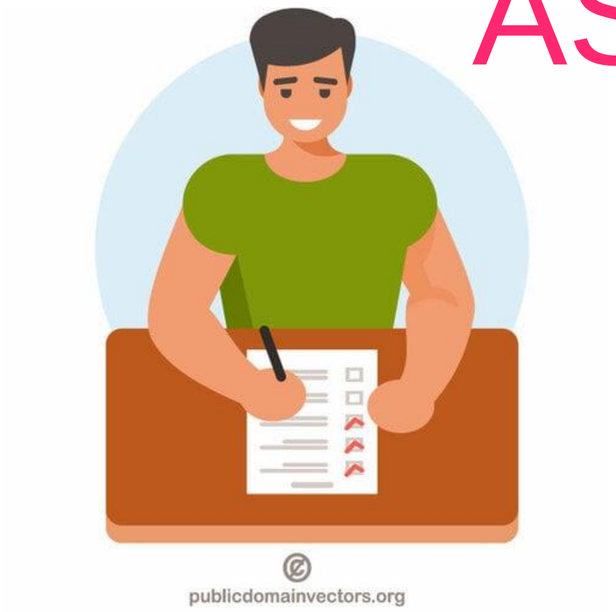
Radial Vane Type MI Instruments

Disadvantages of Moving Iron Instruments.

The following are the disadvantages of Moving Iron Instrument.

1. **Accuracy –** The scale of the moving iron instruments is not uniform, and hence the accurate result is not possible.
2. **Errors –** Some serious error occurs in the instruments because of the hysteresis, frequency and stray magnetic field.
3. **Waveform Error –** In MI instrument the deflection torque is not directly proportional to the square of the current. Because of which the waveforms error occurs in the instrument.
4. **Difference between AC and DC calibration –** The calibration of the AC and DC are differed because of the effect of the inductance of meter and the eddy current which is used on AC. The AC is calibrated on the frequency at which they use.

ASSESSMENT



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TEXT BOOKS

T1 **A. K. Sawhney, “A Course in Electrical & Electronic Measurements & Instrumentation”, Dhanpat Rai & CO., New Delhi, 2022.**

T2 **S. Gupta and J. John , "Virtual Instrumentation using Lab VIEW", Tata McGraw-Hill Publishing Company Limited, New Delhi, 2010.**

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R1 **David A.Bell, "Electronic Instrumentation and Measurements”, Oxford Higher Education, 2013**

R2 **Bouwens A J, “Digital Instrumentation”, Tata Mc Graw Hill, New Delhi2016**

R3 **Martin U. Reissland, “Electrical Measurement – Fundamental Concepts and Applications”, New Age International (P) Ltd., 2015**

R4 **J. B. Gupta, “A Course in Electronic and Electrical Measurements and Instrumentation”, S. K. Kataria & Sons, Delhi, 2013**

R5 **M. S. Anand, “Electronics Instruments and Instrumentation Technology”, Prentice Hall India, NewDelhi, 2012.**

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W2 **https://www.vssut.ac.in/lecture_notes/lecture1423813026.pdf**

W3 **https://hombredelamancha.com/products/ebook-electrical-and-electronic-measurements-and-instrumentation?srsltid=AfmBOorTb5k9Ga1rsImj69-l3SximYYra7U8VhGcqYahqsfk9BR9rC7k**

THANK YOU!!