



# **SNS COLLEGE OF ENGINEERING**

Kurumbapalayam (Po), Coimbatore – 641 107

**An Autonomous Institution**

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

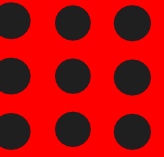
## **DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**COURSE NAME : 19EE101 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

I YEAR /I SEMESTER MECHANICAL ENGINEERING

Unit 1 – Electrical Circuits and Measurements

Introduction to Measuring Instruments





# MEASURING INSTRUMENTS

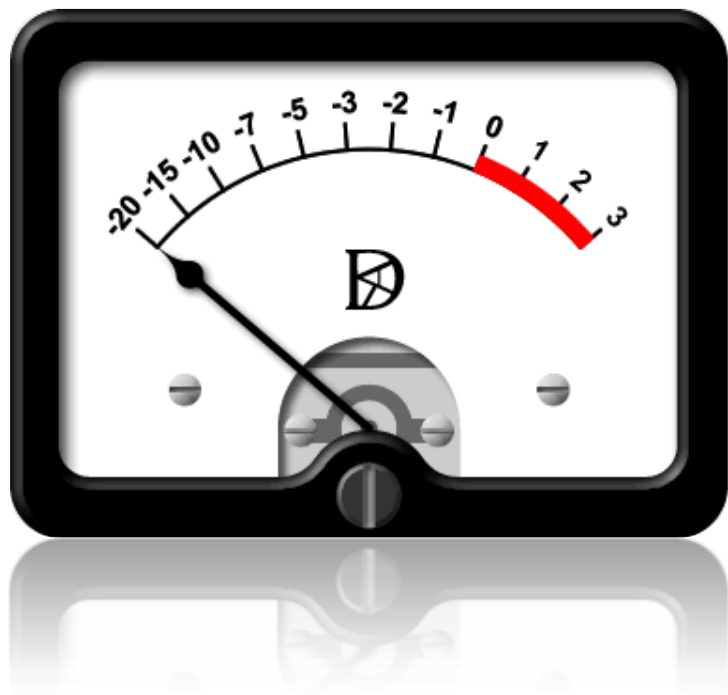
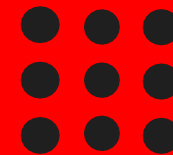
Why do we need measuring instruments in Electrical and Electronics Engineering?



The instruments used for all electrical measurements are called measuring instruments. They include ammeters, voltmeters, wattmeters, energy meters etc.



# BASIC PRINCIPLE



**OMG!!** How it works?

How is the pointer moving?

How do instruments operating to measure electrical and electronic quantities ?





# DEFLECTING TORQUE

- Have you ever played with a magnet ?



- Electrostatic effect is used mainly for the deflecting torque makes the pointer moves from zero position to the final position.

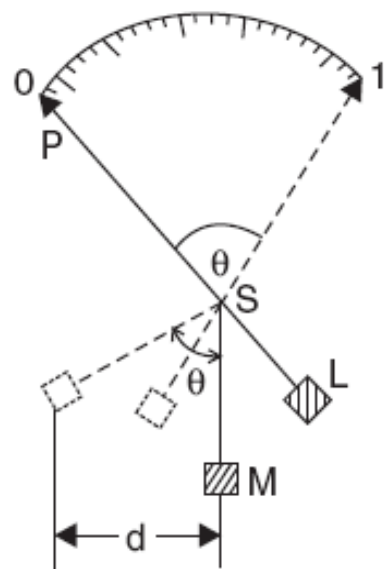


# CONTROLLING TORQUE



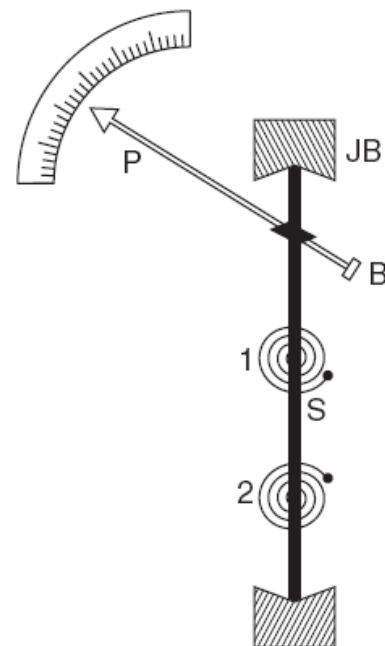
Controlling torque are used to keep the pointer of the instrument in one position and return back if its OFF

## Gravity Control



- P = Pointer
- S = Spindle
- L = Balance weight
- M = Control weight
- e = Angle of deflection

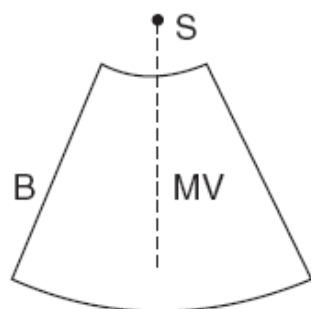
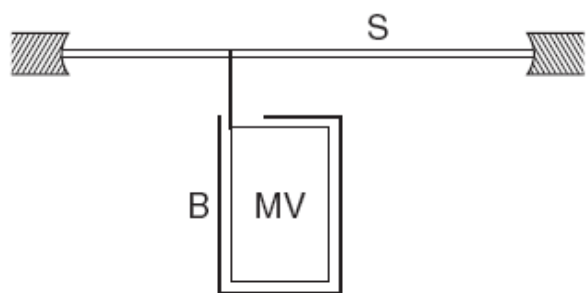
## Spring control



- P = Pointer
- B = Balance weight
- S = Spindle
- JB = Jewelled bearing
- 1,2 = Springs

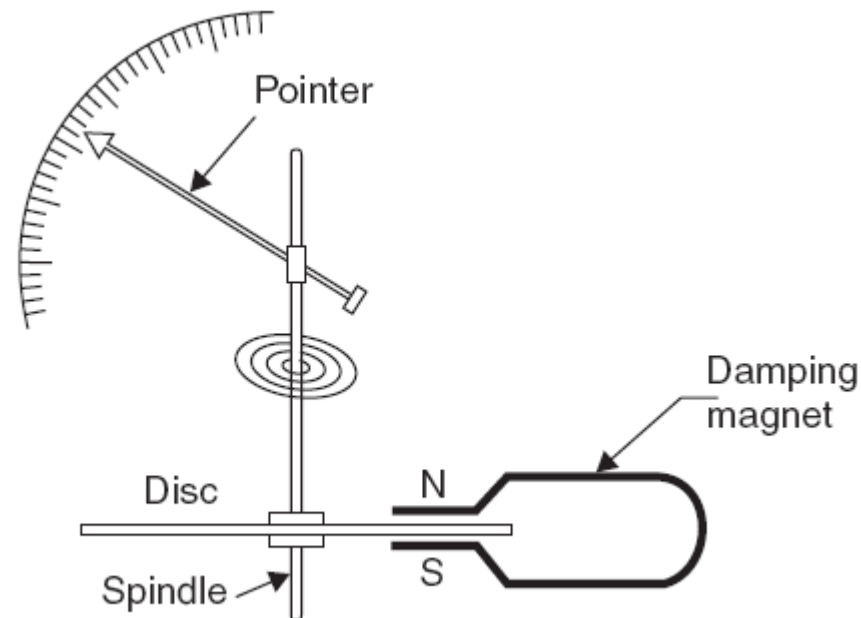
# DAMPING TORQUE

It is used to reduced the oscillations of pointer and also to reach the rest position of the pointer



S = Spindle  
B = Box (sector - shaped)  
MV = Metal vane

Air Damping



Eddy current damping



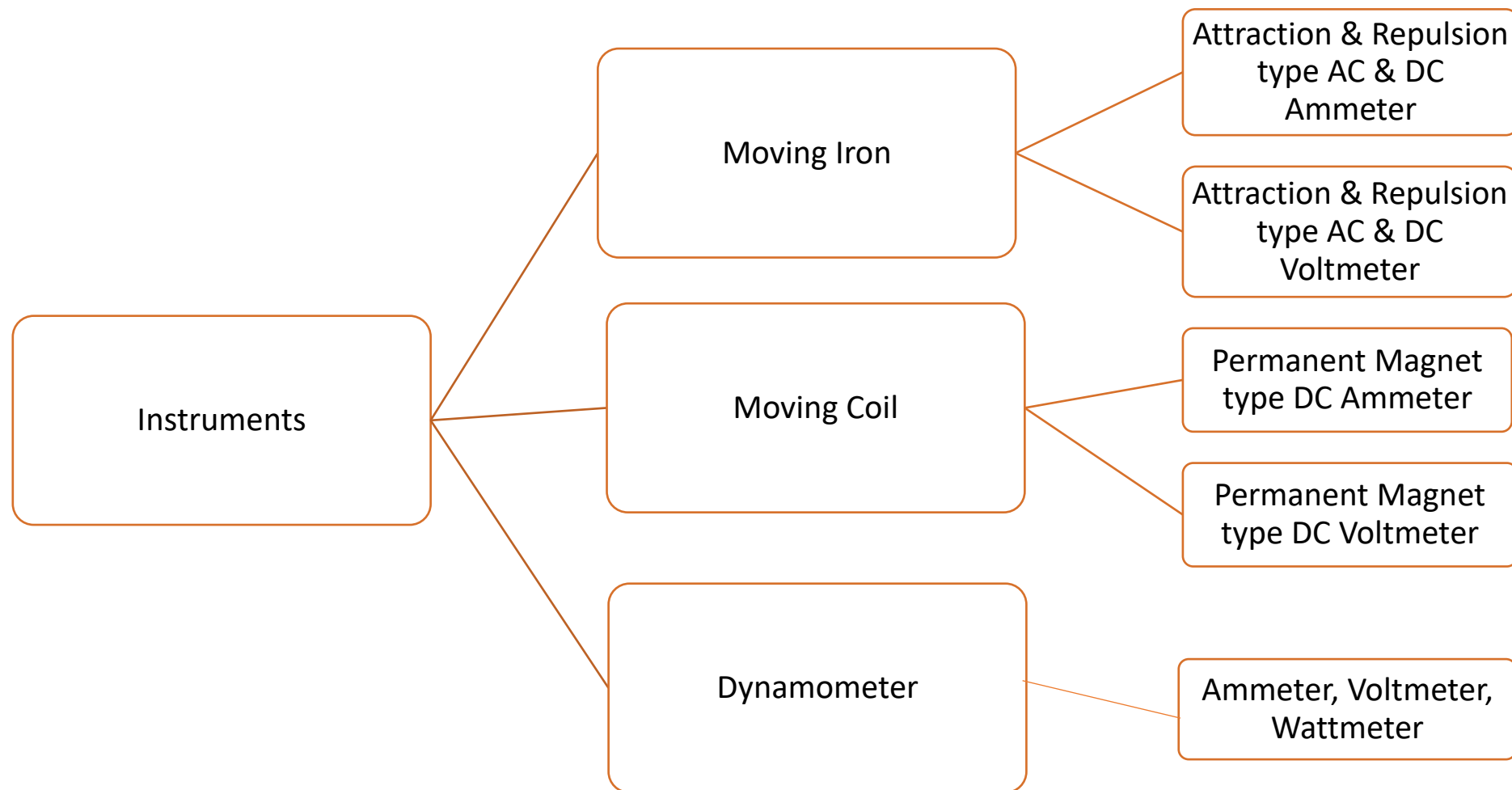
# ASSESSMENT 1

1. \_\_\_\_\_ is used mainly for the deflecting torque makes the pointer moves from zero position to the final position.
2. Damping is used to reduce the \_\_\_\_\_ of pointer and also to reach the rest position of the pointer





# TYPES OF INSTRUMENT







# IQ

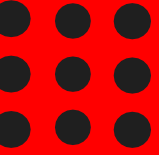
Guess the Instrument name !!





# APPLICATIONS

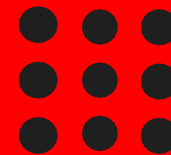
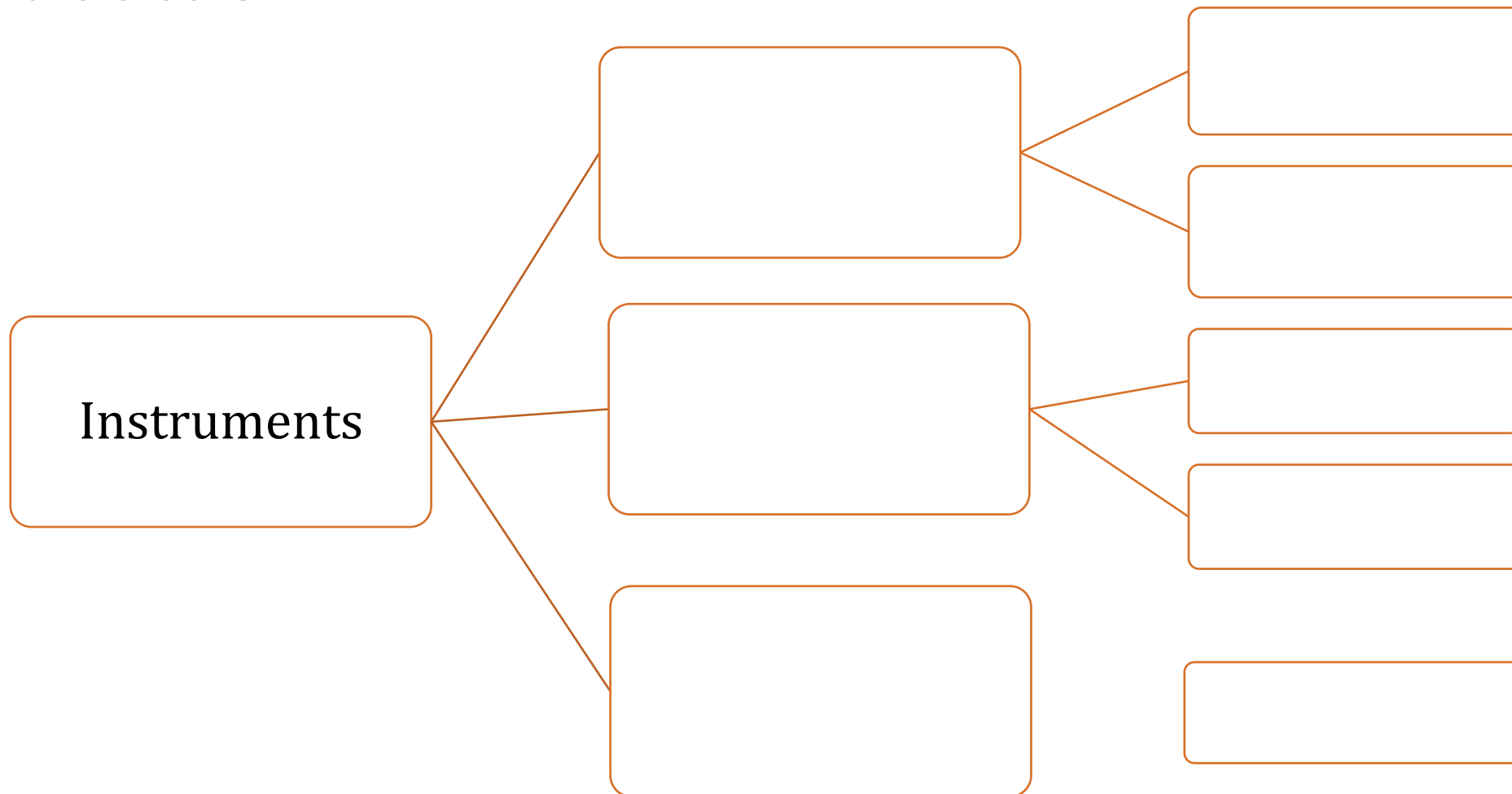
- Electric Motor Industries
- Electric Lift Industries
- Electric Fan Industries
- Television Industries
- Educational Institutions
- TNEB





# Assessment 2

- Fill the blocks





# REFERENCES

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## THANK YOU