# EXPERIMENT #2

## CONVERSION OF GALVANOMETER TO VOLTMETER

### OBJECTIVE:

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### GALVANOMETER:

A galvanometer is a type of sensitive ammeter; an instrument for detecting small electric current. It is an analog electromechanical actuator that produces a rotary deflection of some type of pointer in response to electric current through its coil in a magnetic field.

### WORKING PRINCIPLE OF GALVANOMETER:

Galvanometer works on the principle of conversion of electrical energy into mechanical energy.

### ESSENTIAL PARTS OF GALVANOMETER:

There are five essential parts of a Galvanometer.

1. A U-shaped permanent magnet with concave poles.

2. Flat rectangular coil of wire.

3. A soft iron cylinder.

4. A pointer or needle.

5. A scale.

### CONSTRUCTION:

The flat rectangular coil of thin enamel insulated wire of suitable number of turns wound on an aluminum frame is suspended between the poles of U-shaped magnet by a thin strip. One end of the wire of coil is soldered to connect to an external terminal. The other end is soldered to a loose and soft spiral. A soft iron cylinder is placed within the frame of coil.

### WORKING:

When the current is passed through the coil it becomes a magnet. There is force of attraction is setup between the poles of magnet and coil. As a result a couple is produced in the coil and it is deflected. The current passes through the coil and the angle of deflection has a direct relation with each other. The deflection is measured by a pointer attached to the coil.
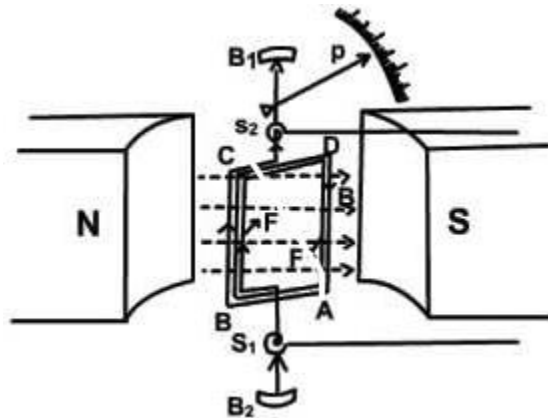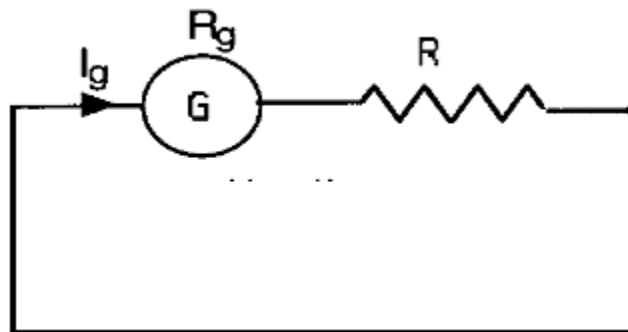
WORKING PRINCIPLE OF GALVANOMETER

## **VOLTMETER:**

A voltmeter is an instrument used for measuring electrical potential difference between two points in an electric circuit. Analog voltmeters move a pointer across a scale in proportion to the voltage of the circuit. Digital voltmeters give a numerical display of voltage by use of an analog to digital converter.

## **CONERSION OF GALVANOMETER TO VOLTMETER:**

For the conversion of galvanometer to voltmeter a resistor of high resistance should be connected in series with the galvanometer to form a voltmeter of desired range.



**VOLTMETER**

To find the value of resistor 'R', use the formula given below.

$$R = \frac{V}{I_g} - R_g$$

V= Desired range for the voltmeter.

$I_g$= Current passing through galvanometer.

$R_g$= Resistance of galvanometer.

## **APPARATUS:**

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## **PROCEDURE:**

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## **CIRCUIT DIAGRAM**

**OBSERVATIONS AND CALCULATIONS:**

| V | R1 | Rg | Rsh | Ig | R |
|---|----|----|-----|----|----|
|   |    |    |     |    |   |

Table 2.1

**CONCLUSION:**

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