***University Of Engineering and Technology Peshawar***

***LAB REPORT #01***

***Applied Physics***  ***Submitted to:***

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# EXPERIMENT # 1

Determine the resistance of Galvanometer by Kalvin method

## THEORY

Kelvin Method:

Kelvin Method, after William Thomson, Lord kelvin, who invented the kelvin bridge in 1861 is used to measure very low resistances using four-terminal sensing.

Objective

To find the resistance of galvanometer using a post office box.

APPARATUS

* Post office Box
* High resistance box
* Galvanometer
* Connecting wires
* Battery

## Description Of Apparatus

1. Galvanometer:

An instrument for detecting or measuring a small electric current by movements of a magnetic needle or of a coil in a magnetic field.

1. High resistance box:

The value of the high resistance box lies **from 1Ω to 5000Ω or above** while the value of the low resistance box is between 1 to

500Ω. In fractional resistance box, the value of resistance is in the form of a fraction. The range of fractional box lies between 0.1Ω to 50Ω. The construction of the box is simple and cheap.

1. Post Office Bridge:

The post office box is a Wheatstone type bridge style testing device with pegs and spring arms to close electrical circuits and measure properties of the circuits under test.

1. Connecting Wires:

Wire used to extend the firing line or leg wires in an electric blasting circuit.

### Formula used

G = QR/P

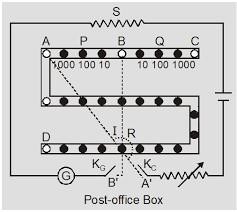
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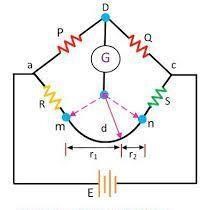
P= AB arm resistance of post office box

Q=BC arm resistance of post office box

R= AD arm resistance of post office box

### CIRCUIT DIAGRAMs





### Procedure

1.Make connections as shown in circuit diagram

1. Mark points A,B,C,D,k1,k2 on the post office box
2. Connect the Galvanometer between C and D and the battery C and k1. Connect D through key2.
3. Take out the plugs from P and Q simultaneously.

5. Press the key k1 and adjust the value of resistance in the high resistance box to obtain the deflection within scale.

6.Now take out the plug from R, press k1 and note the deflection. Also press k2 and note the deflection again. If the needle of galvanometer deflects, go on repeating with the values of R in increasing order.

1. Start with the lower value of R and increase it in steps till on pressing k1 first and then k2 it does not eflect.
2. Repeat the procedure for taking different readings.

#### CALCULATIONS

##### Observations

The galvanometer always shows some deflection when the key k1 is pressed.  When a balanced point is obtained there is no change of deflection on pressing k2. The resistance of galvanometer remains constant.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S  NO | P  Ω | Q  Ω | R  Ω | G =  QR/P |
|  |  |  |  |  |
| 1. |  |  |  |  |
| 2. |  |  |  |  |
| 3. |  |  |  |  |
| 4. |  |  |  |  |

##### PRECUATIONS

1. The galvanometer should be connected between C and D.
2. Only one battery should be used, and the resistance should be so adjusted that the deflection is large and lies within the scale.
3. When the key k2 is pressed after key k1 there should be no change in the defection.