

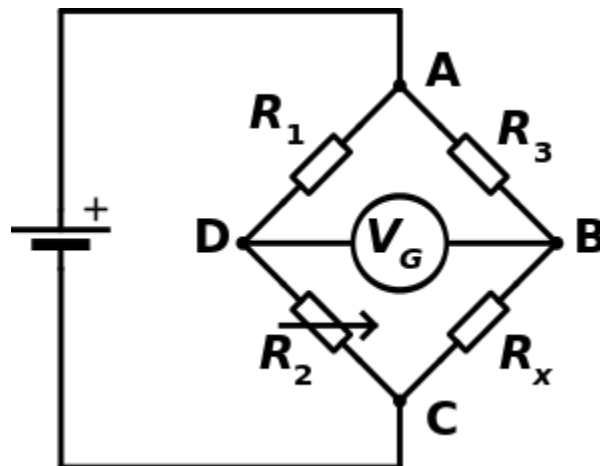
EXPERIMENT # 9

TO MEASURE THE UNKNOWN RESISTANCE BY WHEATSTONE BRIDGE

OBJECTIVE:

THEORY:

A **Wheatstone bridge** is an electrical circuit used to measure an unknown electrical resistance by balancing two legs of a bridge circuit, one leg of which includes the unknown component. The primary benefit of a Wheatstone bridge is its ability to provide extremely accurate measurements.



WHEATSTONE BRIDGE

OPERATION:

R_x is the unknown resistance to be measured; R_1 , R_2 and R_3 are resistors of known resistance and the resistance of R_2 is adjustable. If the ratio of the two resistances in the known leg (R_2/R_1) is equal to the ratio of the two in the unknown leg (R_x/R_3), then the voltage between the two midpoints (**B** and **D**) will be zero and no current will flow through the galvanometer V_g . If the bridge is unbalanced, the direction of the current indicates whether R_2 is too high or too low. R_2 is varied until there is no current through the galvanometer, which then reads zero.

MATHEMATICAL FORM:

At balanced condition the ratio will be,

$$\frac{R_2}{R_1} = \frac{R_x}{R_3}$$

$$\Rightarrow R_x = \frac{R_2}{R_1} \cdot R_3$$

APPARATUS:

PROCEDURE:

OBSERVATIONS AND CALCULATIONS:

S.NO	V	R1	R2	R3	RX

CONCLUSION:
