VESP Vision

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Program Code:-AO2I,EE2I
Course Name:-Applied Science(Physics)

Course Code : -22211

Course coordinator: Mrs. Deepa Gupte

Date: 1/4/21

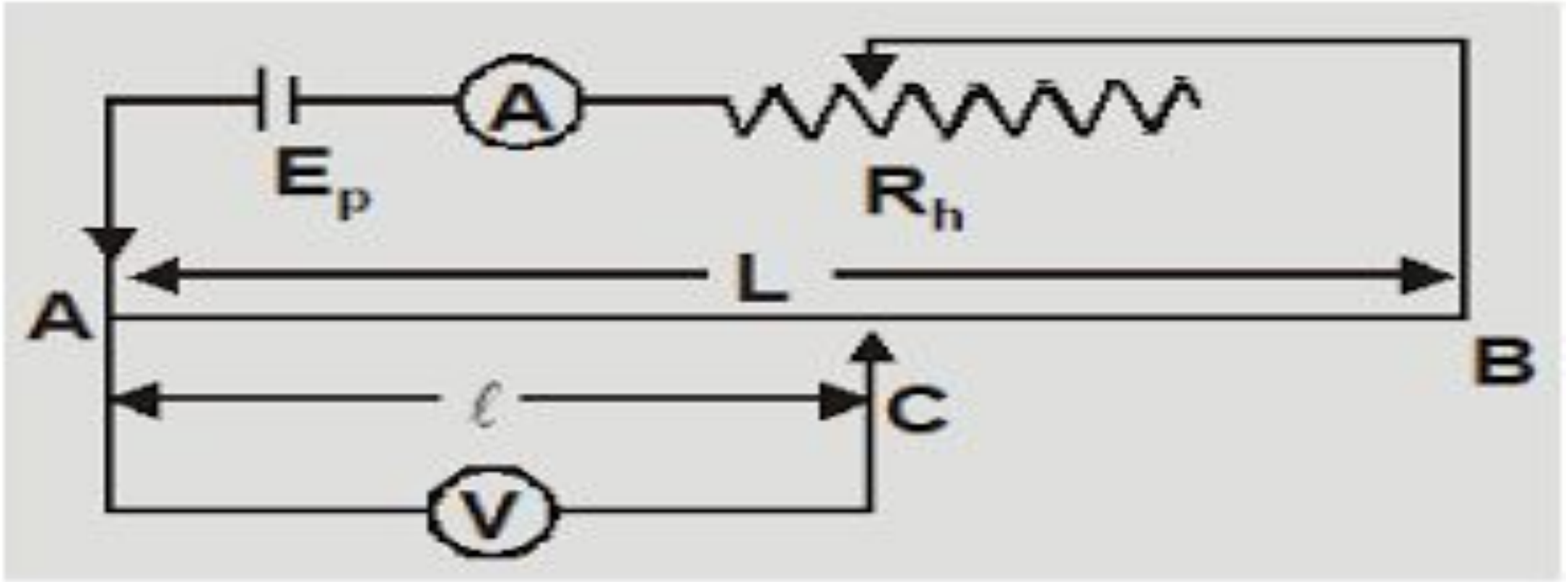
Unit No:1
Unit Name: Electricity and Capacitance

Unit Outcomes (UO1e):Explain the principle of potentiometer
Learning Outcome (LO5) : Students will be able to explain principle of potentiometer

Learning Objective/ Key learning

- Students will be explain principle of potentiometer

Potentiometer Working Principle



Principle of Potentiometer

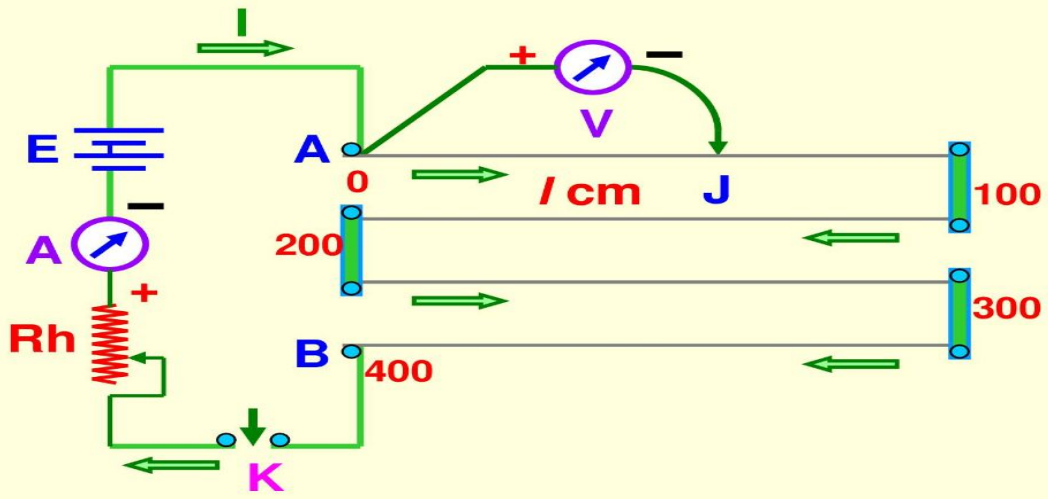
Potentiometer:

Principle:

$V = I R$

$= I \rho l/A$

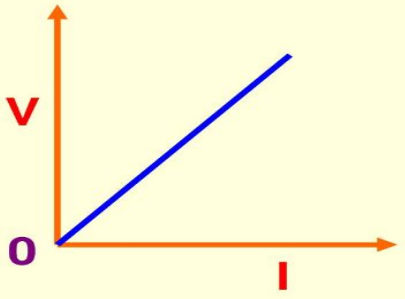
If the constant current flows through the potentiometer wire of uniform cross sectional area (A) and uniform composition of material (ρ), then



$V = KI$ or $V \alpha I$

V /I is a constant.

The potential difference across any length of a wire of uniform cross-section and uniform composition is proportional to its length when a constant current flows through it.



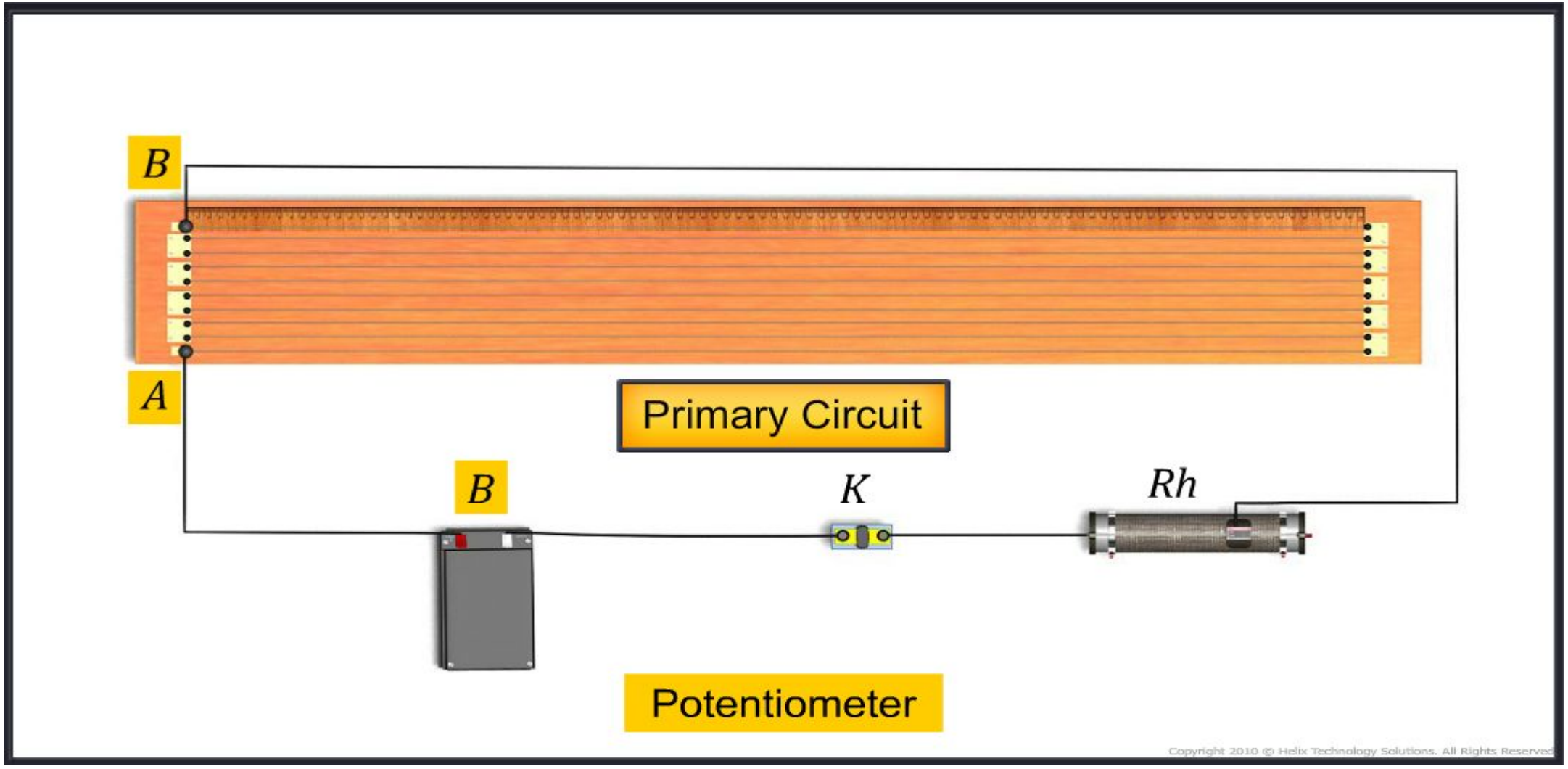
Potential Gradient

Potential drop per unit length of the wire is known as potential gradient. i.e, k=V/L

S.I. unit is volt/m

CGS unit is Volt/cm

Potentiometer



Applications of Potentiometer

- To measure e.m.f of a cell.
- To compare e.m.fs of two cells.
- To measure internal resistance of a cell.

Circuit to determine internal resistance of a cell

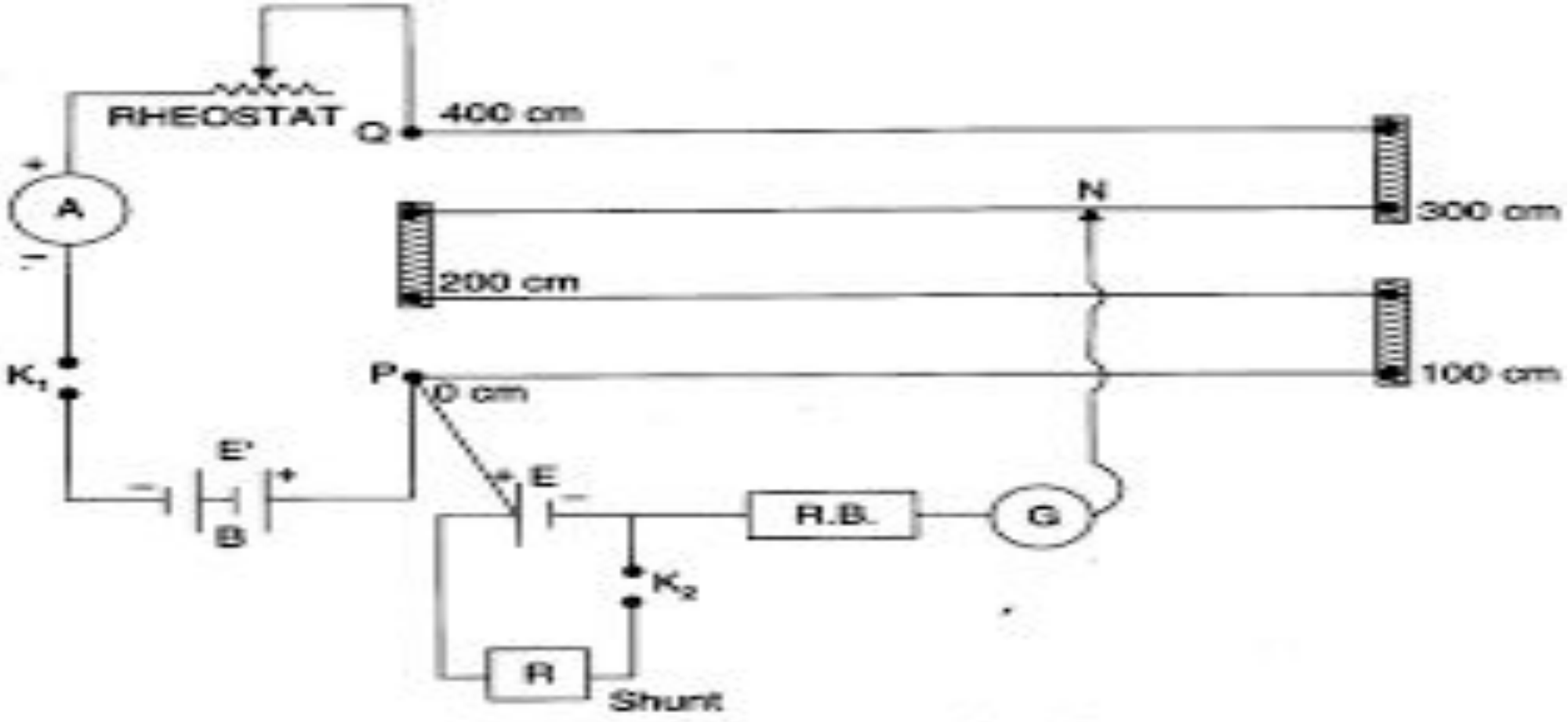
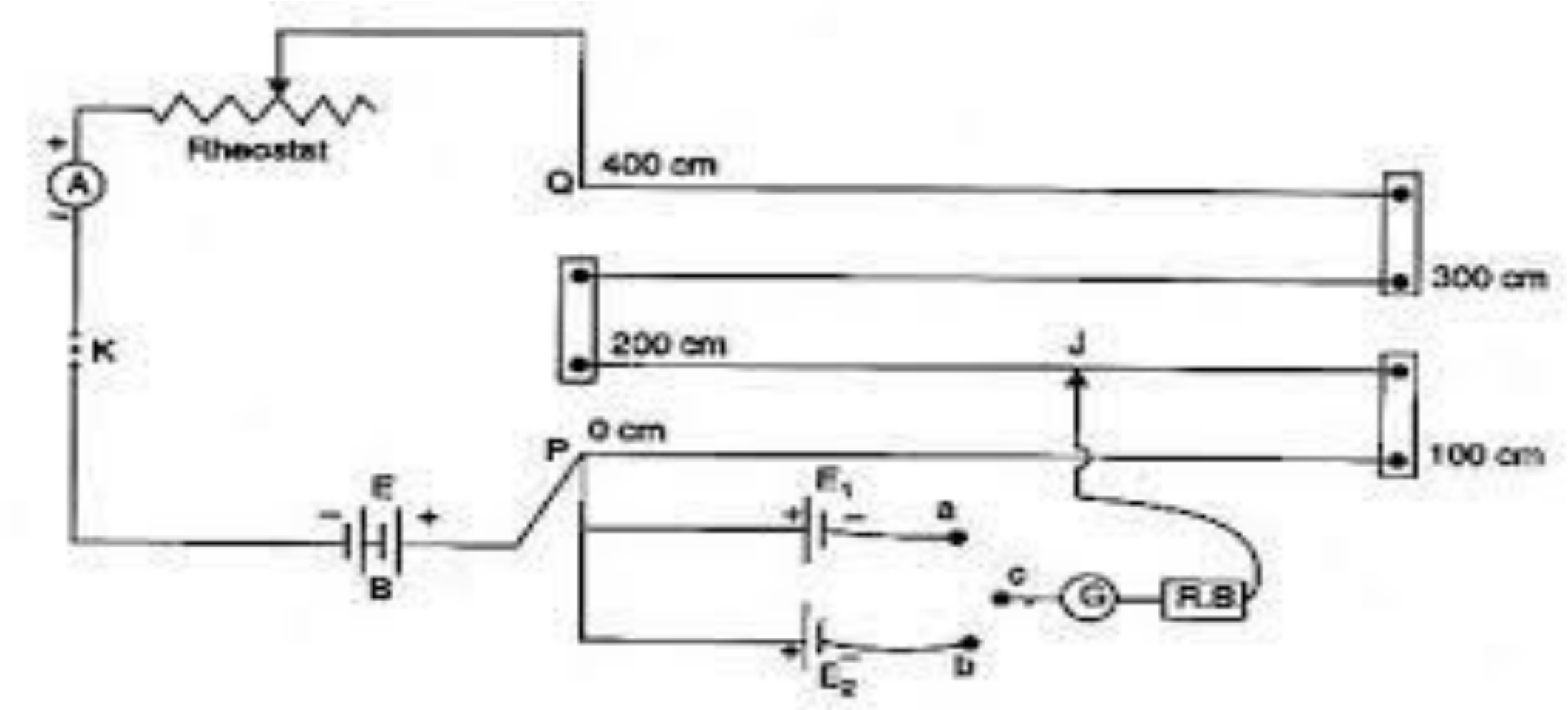


Fig. Internal resistance of a cell.

Circuit to compare e.m.f. of two cells



Potentiometer

To compare emf of two cells E1/E2=L1/L2

Internal resistance r=R(L1-l2)/L2

Numerical on Potentiometer

A potentiometer wire is 10 m long and a potential difference of 5 V is maintained between its ends. Find the e.m.f. of a cell which balances against a length of 180 cm of the potentiometer wire.

Solution: Given: K = (5 /1000) V/cm

K= (1 /200) V/cm, L = 180 cm

To find: e.m.f. of the cell

Formula: E = K L

Calculation: From formula, E =(1 /200) x 180

E = 0.9 V

Ans: The e.m.f. of the cell is 0.9 V