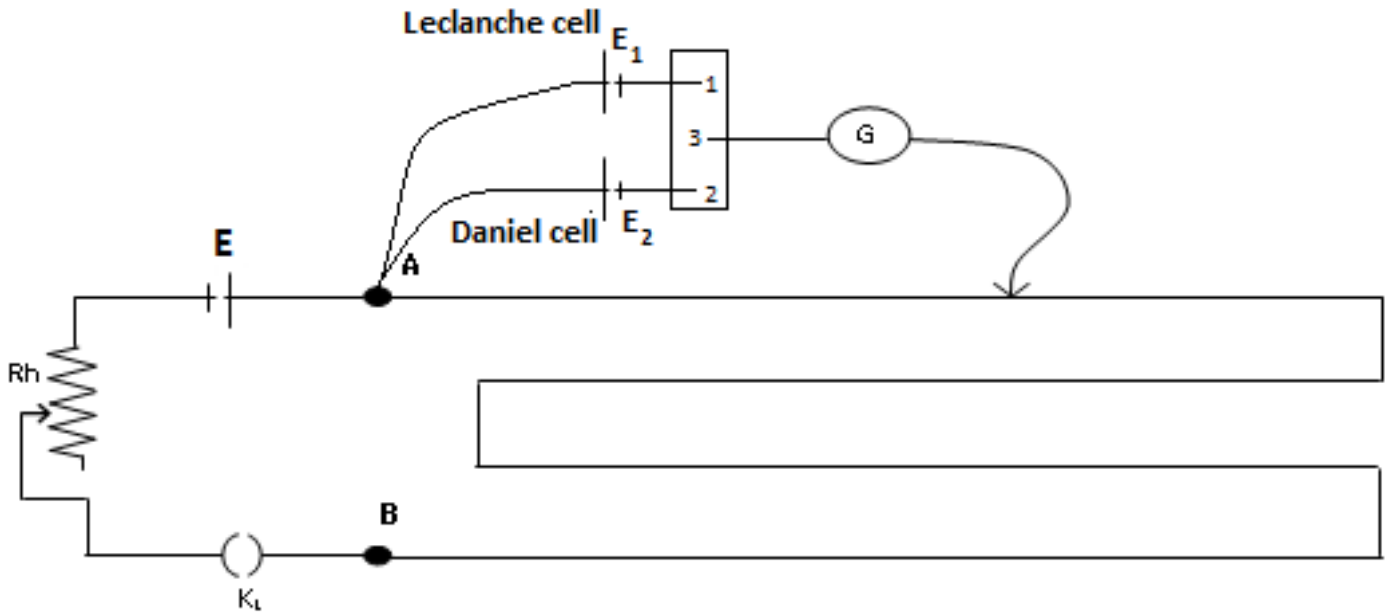

OBSERVATIONS &CALCULATIONS

Trial No	Balancing length for		Ratio of e.m.f $\frac{E_1}{E_2} = \frac{\ell_1}{\ell_2}$
	Leclanche cell ℓ_1 in cm	Daniel cell ℓ_2 in cm	
1			
2			
3			
4			
5			
6			

THE POTENTIOMETER – 2 (ratio of emf)

AIM

To compare e.m.f of Leclanche cell and Daniel cell

APPARATUS

Potentiometer, Accumulator, Leclanche cell, Daniel cell, resistance box, rheostat, key, three terminal key, galvanometer

THEORY

By the principle of potentiometer, if ℓ_1 is the balancing length for leclanche cell of emf $\mathbf{E_1}$ then

$$\mathbf{E_1} \alpha\ \ell_1 \quad \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

if ℓ_2 is the balancing length for Daniel cell of emf $\mathbf{E_2}$ then

$$\mathbf{E_2}\ \alpha\ \ell_2 \quad \ldots\ldots\ldots\ldots\ldots\ldots(2)$$ Dividing (1) and (2)

Ratio of e.m.f of the two cells $\dfrac{\boldsymbol{E_1}}{\boldsymbol{E_2}} = \dfrac{\ell_1}{\ell_2}$

PROCEDURE

The connections are made as shown in the figure. The primary key K_1 is closed and insert key in the three terminal keys such that $\mathbf{1}$ is connected. Now the rheostat is adjusted such that galvanometer deflects to both sides when jockey touches both ends (A and B) of potentiometer wire. Make sure that when $\mathbf{2}$ is connected , galvanometer deflect towards both sides as later.

Now by connecting $\mathbf{E_1}$ balancing length ℓ_1 is determined using the jockey. Now $\mathbf{E_2}$ is connected and balancing length ℓ_2 is determined without any changes in rheostat. After finding one set of reading **(ℓ_1 & ℓ_2)** , the experiment is repeated by varying the current from primary circuit by adjusting rheostat. Make sure that each time ℓ_1 & ℓ_2 is measured in the same setting of rheostat. Now ratio of e.m.f of the two cells $\dfrac{\boldsymbol{E_1}}{\boldsymbol{E_2}}$ is determined from the mean of $\dfrac{\ell_1}{\ell_2}$

RESULT

Ratio of e.m.f of the two cells $\dfrac{\boldsymbol{E_1}}{\boldsymbol{E_2}}$ = **……**