EXPERIMENT 5

To compare EMF of two given primary cells using potentiometer:

Aim: To compare EMF of two given primary cells using potentiometer

Apparatus: potentiometer , a leclanche cell , a daniel cell , an ammeter , a voltmeter , a galvanometer , a battery , (battery eleminator), a rheostat , of low resistance , a resistance box , a one way key , a two way key , a jockey , a set square , connecting wire , a piece of sand paper .

Theory:

When we keep key (K_1) closed and (K_2) open, let the null point found be l_AJ_1

$E_1=Kl_Aj_1$ (1)

When we keep K_1 open and K_2 closed, let null point obtained by l_AJ_2.

$E_2=Kl_Aj_2$ (2)

(1)/ (2)

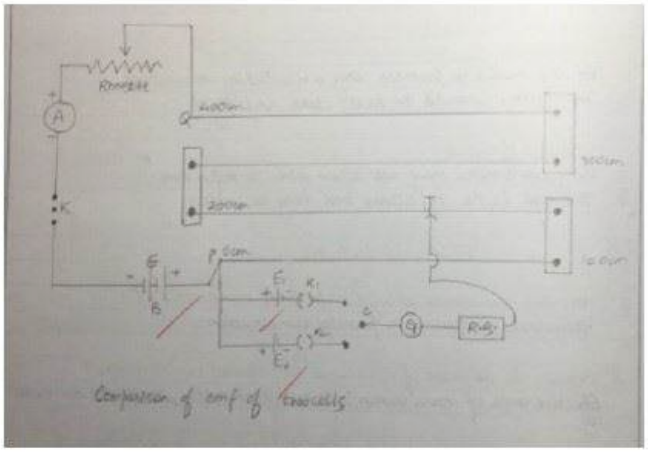
$E_1 / E_2 = Kl_AJ_1 / Kl_Aj_2$

$E_1/E_2 =l_1/l_2$

Where E_1 and E_2 are the emf of two given cells.

Procedure:

1. Arrange the apparatus as shown in the circuit diagram.
2. Connect the positive poles of the cells to the terminal and the negative poles to the terminal a and b of the two way key.
3. Insert the plug in the key K and also in between the terminals a and c of the two way key.
4. Slide the jockey gently over the potentiometer wires until you obtain a point of no deflection.
5. Note the length l_1 at the point.
6. Repeat this with E_2 by disconnecting E_1 and inserting plug into gap a and c of two way key.
7. Record l_2 at null point.
8. Repeat this different resistance.



Observation table:

Balancing Lengths		$E_1 / E_2 = l_{AJ1} / l_{Aj2}$
L_1 for cell E_1 (cm)	L_2 for cell E_2 (cm)	
327	376	0.86
323.5	371	0.87
321.5	369	0.87
312.5	352.5	0.88

Result:

The ratio of emf E_1/E_2 ~0.87.

Precaution:

1. The connections should be neat, clean and tight.
2. The plugs should be introduced in the keys only when the observations taken.
3. The positive poles of the battery E and cells E_x and E_2 should, all be connected to terminal at the zero of the wires.

4. The jockey key should not be rubbed along the wire. It should touch the
5. The e.m.f. of the battery should be greater than the e.m.f.'s of the either cells.
6. Some high resistance plug should always be taken out from resistant the jockey is moved along the wire.