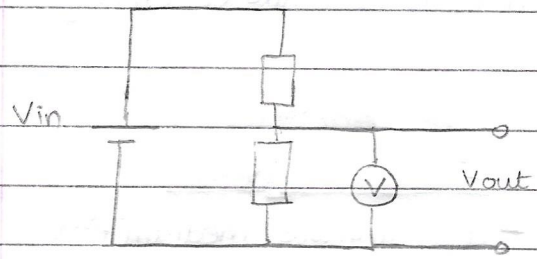
* Practical Circuits *

Q-1) Potential dividers.



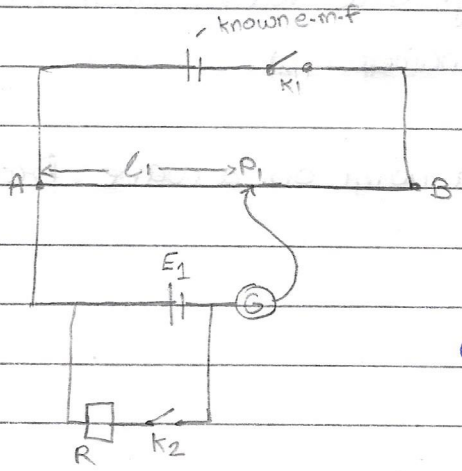
$$V_{out} = \left(\frac{R_2}{R_1 + R_2}\right) \times V_{in}$$

V_{in} → total voltage flowing accross the 2 resistors.

Q-2) Potentiometer.

> used for :

① measuring e.m.f of a cell.
② comparing e.m.f's of 2 cells
③ finding internal resistance of a cell.



① the key K_1 is closed and the null point P_1 is found (zero deflection on galvanometer) the distance from A to P_1 is l_1.
↳ $E_1 \propto l_1$

② Both keys, K_1 and K_2 are closed and the new null point P_2 is found. the distance from A to P_2 is l_2.
↳ $V \propto l_2$

$$\frac{E_1}{V} = \frac{l_1}{l_2} \qquad E_1 = I(R + r) \qquad V = IR \qquad \therefore \frac{I(R+r)}{IR} = \frac{l_1}{l_2}.$$

$$\therefore \quad r = \frac{R(l_1 - l_2)}{l_2}.$$