Phy:-

(1)

$R_{eq} = \frac{R_0}{2} + \frac{R_0}{2} \parallel R$

$I = \frac{V}{R_{eq}}$

P.D

$V_R = I\left(\frac{R_0}{2} \parallel R\right)$

$V_R = \frac{V}{R_{eq}}\left(\frac{R_0}{2} \parallel R\right)$

$V_R = \left(\frac{R_0}{2} \parallel R\right)$

$V_R = \frac{R}{4R + R_0} V$

2 (1) By increasing R current through AB decrease so potential gradient decrease hence a greater length of wire would be needed for balancing same PD so null point shifted toward B

(ii) By decreasing resistance of AB current remains same. Potential gradient does not change as K_2 is open so there is no effect on null point.

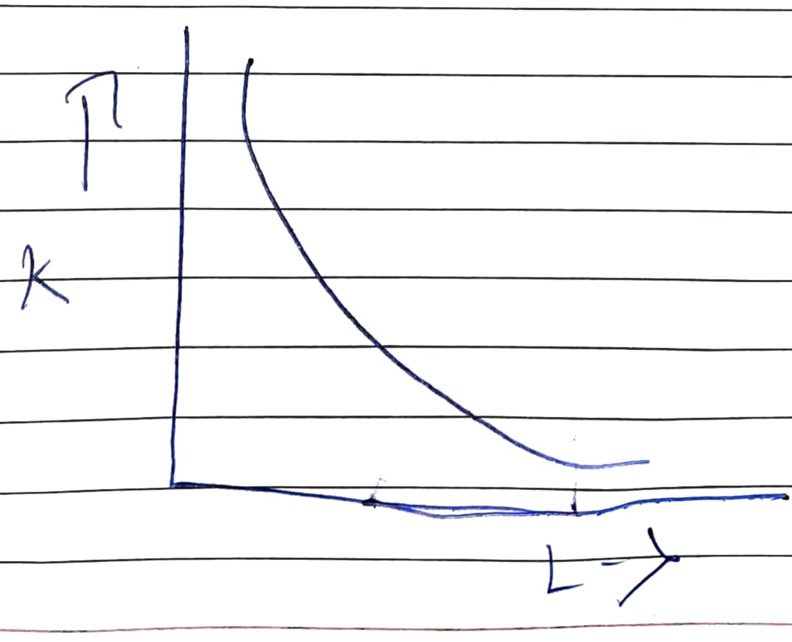
③ a)

(i) to have lower value of potential gradient i.e. lower least count or greater sensitivity

(ii) area of cross section has to be uniform to get a uniform wire as per principle of potentiometer

(iii) emf driving cell has to be greater than emf of primary cells

b) $PP = K = \frac{V}{L}$



4(i) So AI will loss

ii R_1 ↓es

Current ↑es

Potential Gradient ↑es

AI = Balance length ↓es

(5) (i) Decreases

PD gradient increase

ii increases

terminal PD across cell would increase