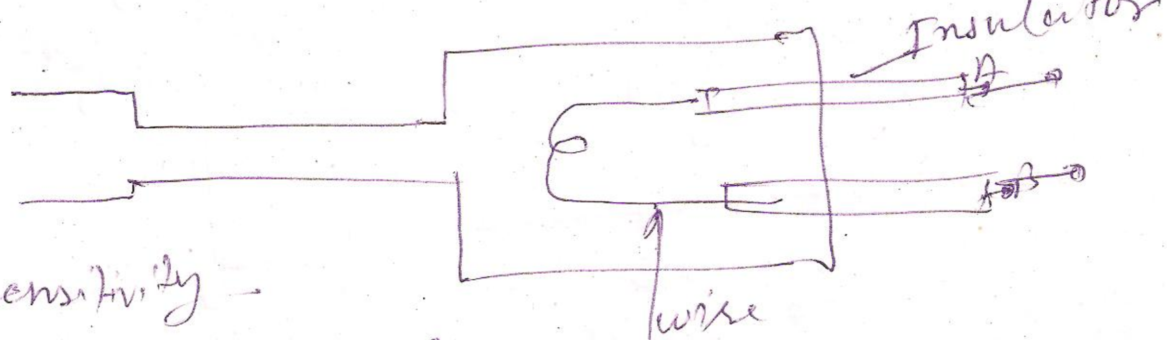
from eqn ① & ② and substitute ③ & ④. ⑤

$$\therefore \tau \frac{dP_2}{dt} + P_2 = P_1$$

$$\tau = \frac{128\,\mu l}{\pi d^4}\left(\frac{A}{\rho g} + \frac{V}{P_2}\right)$$

* High Pressure measurement :-



For sensitivity -

$$R = \frac{4\rho l}{\pi d^2}$$

$$\frac{dR}{R} = \frac{dL}{L} - \frac{2dD}{D} + \frac{d\rho}{\rho}$$

Relation b/w three strains $\epsilon_x, \epsilon_y, \epsilon_z$ in three ⊥ dirn. f in terms of σ_x, σ_y & σ_z.

$$\epsilon_x = \frac{1}{E}\left[\sigma_x - v(\sigma_y + \sigma_z)\right]$$

$$\epsilon_y = \frac{1}{E}\left[\sigma_y - v(\sigma_x + \sigma_z)\right]$$

$$\epsilon_z = \frac{1}{E}\left[\sigma_z - v(\sigma_x + \sigma_y)\right]$$

v poisson's Ratio, E = Young's modulus of elas

If takin $\sigma_x = \sigma_y = -P$, $\sigma_z = 0$

$$\therefore \epsilon_x = \epsilon_y = -\frac{P}{E}(1-v) = \frac{dD}{D}.$$

$$\epsilon_z = \frac{2vP}{E} = \frac{dL}{L}$$

$$\therefore \frac{dR}{R} = \frac{2vP}{E} + \frac{2P}{E}(1-v) + \frac{d\rho}{\rho}$$

$$= \frac{2P}{E} + \frac{d\rho}{\rho}$$