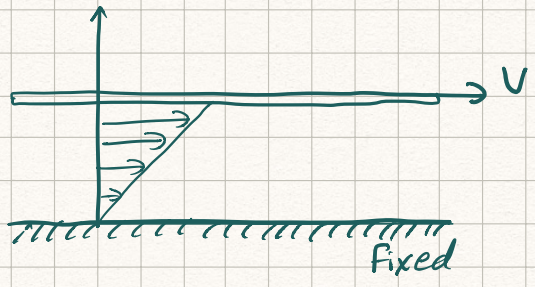
8:30

80 - mins

4 - problems → 1 hydrostatic (Grate)

10% - Shot answer (2 - 3) short answers

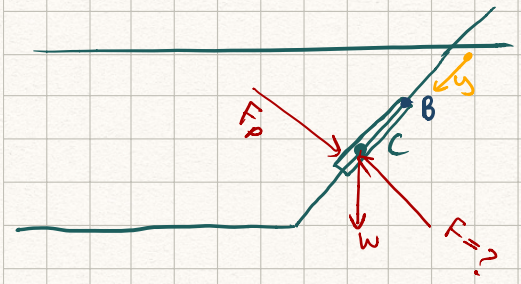
fluid Characteristics { Viscosity / Shear Stress = $\tau = \mu \frac{dV}{dy}$ (Slope V) ; Surface Tension : $\sigma L = F$



hydrostatics : { Pressure force : F_p { Horizontal → $F_p = PA$; Vertical / Inclined → $F_p = P_c A$, $P_c = h_c \gamma$; Curved → $F_p = \int P dA$

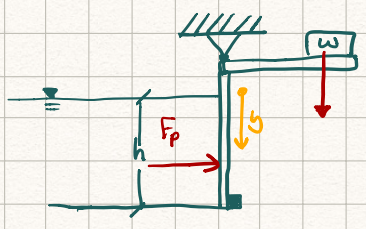
Eq E : $P_1 \pm \Sigma \gamma h = P_2$ * A lot of partial marks

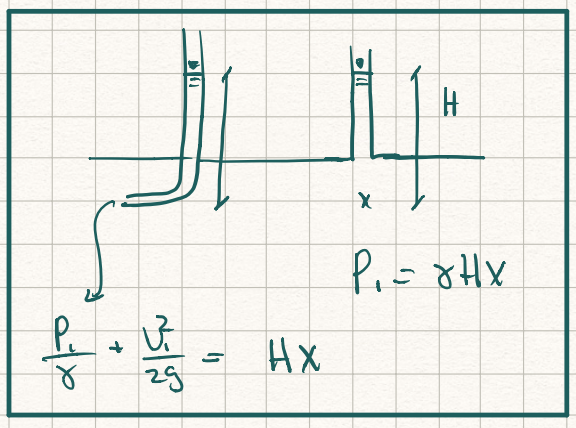
Buoyancy Force : $F_b = \gamma \forall_b$



$\Sigma M_B = 0$

$y_{cp} = y_c + \frac{I}{y_c A}$





B.E :

$$h_1 = h_2$$

Assume:

- No loss
- Same Streamline

$$\frac{P_1}{\gamma} + z_1 + \frac{V_1^2}{2g} = \frac{P_2}{\gamma} + z_2 + \frac{V_2^2}{2g}$$

Pipe:

- Piezometer ← $P_2 = \frac{P}{\gamma} + z$
- Monometer ← Eq. E (II) ← $P_1 - P_1$
- Stagnation tube ← $\frac{P}{\gamma} + z + \frac{V_2^2}{2g}$

Assignment 4. Q1 Redo that one

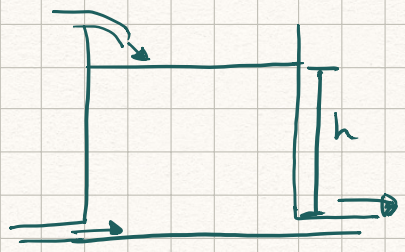
Continuity. Eq :

$$0 = \frac{dm_{cv}}{dt} + (\dot{m}_{out} - \dot{m}_{in})$$

1 - $C\forall$

2 - $\dot{m} = \rho Q$

3 - $Q = VA$



$$\frac{dm_{cv}}{dt} = \frac{d}{dt}(\rho \forall)$$

$$= \frac{d}{dt}(\rho h A)$$

$$= \rho A \frac{dh}{dt}$$

Momentum Eq°:

$$\sum F_{ext} = 0 + \rho(Q_{Vout} - Q_{Vin}) \begin{cases} x: \\ y: \end{cases}$$

1 - CV

1) Vane
2) Open Channel
3) moving CV