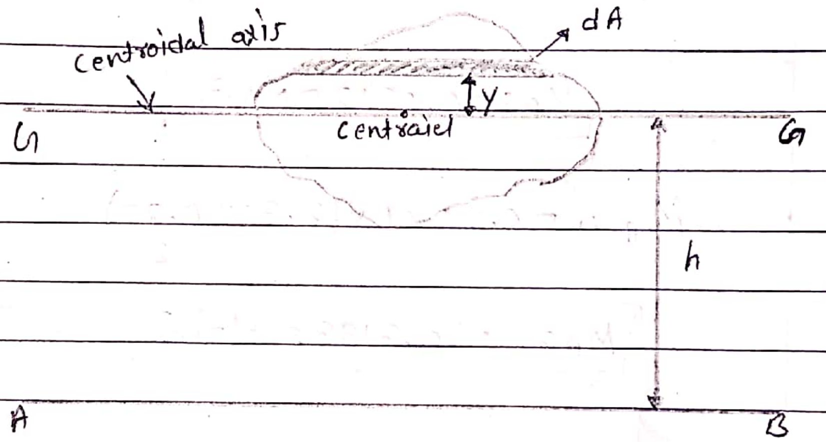
Page No. ______
Date

Section-2

Q2 Ans.

#> Parallel Axis Theorem :-

- Accⁿ to this theorem, moment of inertia about any axis in the plane of an area is equal to the sum of moment of inertia about a ||al centroidal axis and the product of area and square of distance b/w the two parallel axis.



- Accⁿ to defination :-

$$\boxed{I_{AB} = I_G + Ah^2}$$

where,

I_{AB} → Moment of inertia about the line AB.

A → Area of the plane fig.

h → Distance b/w the axis AB and parallel centroidal axis "GG."

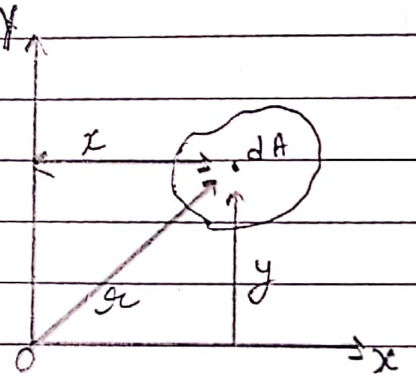
Page No. ____
Date

Perpendicular Axis Theorem:-

- The moment of inertia of an area about an axis perpendicular to its plane (i.e, polar moment of inertia) at any point 'O' is equal to the sum of moment of inertia about any two mutually perpendicular axis through the same point 'O' and lying in the plane as the given area.

- Let dA have coordinate of x & y.

Then, from the definition:-



$$I_{zz} = \Sigma r^2 dA$$
$$= \Sigma (x^2+y^2) dA$$
$$= \Sigma x^2 dA + \Sigma y^2 dA$$

$(\because r^2 = x^2+y^2)$

$$\therefore \boxed{I_{zz} = I_{xx} + I_{yy}} \quad \text{Ans.}$$

Where,
" I_{zz} " is also called "polar moment of inertia."

Page No. ______
Date

Section-2

Q2

Ans. Given :- $F_C = 0$

$F_B = 0.25 \times 1$

$F_B = 0.25 \text{ kN}$

$F_A = 0.25 \text{ kN}$

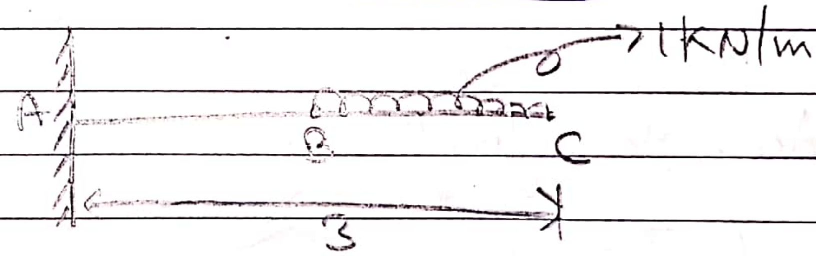
$M_C = 0$

$M_B = -0.25 \times 1 \times \left(\frac{0.25}{2}\right)$

$\boxed{M_B = -0.03125 \text{ N-m}^2}$

$M_A = -0.25 \times 1 \times \left(2.75 + \frac{0.25}{2}\right)$

$\boxed{M_A = -0.71875 \text{ N-m}^2}$



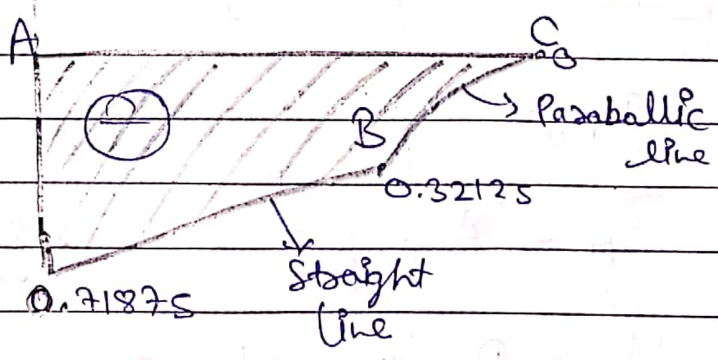


Fig : Bending Moment Diagram