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Sec : B

Assignment: 03

Engr Amjed Islam.

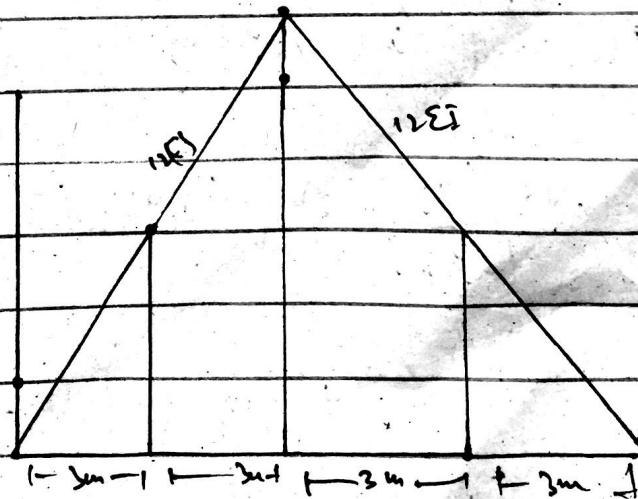
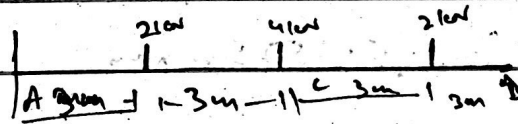
Assignment : 3

Q No: 2

Determine

----- mm⁴;

Sol:-



$$Q/c = \frac{1}{2} \left(\frac{12}{EI} \right) (3) + \left(\frac{12}{EI} \right) (3) + \frac{1}{2} \left(\frac{6}{EI} \right) (3)$$

$$Q/c = \left(\frac{18}{EI} \right) + \left(\frac{36}{EI} \right) + \left(\frac{9}{EI} \right)$$

$$Q/c = \frac{63}{EI} \Rightarrow \frac{63}{(200 \times 10^6) (6 \times 10^8) (1000)^2}$$

$$Q/c = 0.0525 \text{ rad}$$

$$Q_A = 0.0525 \text{ radian}$$

$$t_{A/c} = \left[\frac{1}{2} \left(\frac{12}{EI} \right) (3) \right] \left(\frac{2}{3} (3) \right)$$

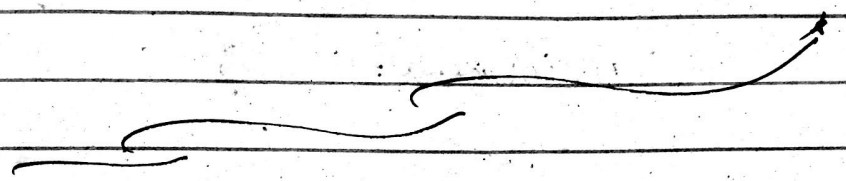
$$+ \left[\frac{12}{EI} (3) \right] \left(3 + \frac{1}{2} (3) \right) + \left[\frac{1}{2} \left(\frac{6}{EI} \right) (3) \right]$$

$$\left(3 + \frac{2}{3} (3) \right)$$

= 0.202m

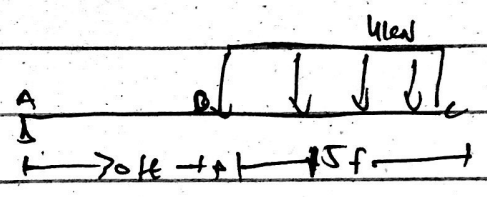
So $\Delta c \frac{t_A}{t_c} = 0.202m$

= 202m Ass



★

Q1)



Step (a) = ?

Displacement (Δ_c) = ?

first we have to draw
M/EI diagram.

4

Sol:

$$+\uparrow \sum MA = 0$$

$$-V_B \times 30 + (4 \times 15) \times 37.5 = 0$$

$$\boxed{V_B = 75 \text{ k}}$$

$$+\rightarrow \sum M_B = 0$$

$$V_A \times 30 + (4 \times 15) \times 7.5 = 0$$

$$\Rightarrow \boxed{V_A = -15 \text{ k}}$$

$$\Delta_c = \frac{-194062.5}{2} - \left(\frac{67500}{EI} \right) \times \frac{3}{2}$$

$$\Delta_c = \frac{-295312.5}{EI} \quad \text{k-ft}$$

Slope at point B

$$\theta_B = \frac{\Delta_c}{15}$$

$$= \frac{(795312.5)}{EI} \cdot 15$$

$$Q_B = \frac{19687.5}{EI} \text{ k. ft}^2$$

For displacement

$$t_c/A = \Delta_c + \Delta$$

$$\frac{\Delta'}{45} = \frac{t_c/A}{30}$$

$$\Delta = \frac{3}{2} t_c/A$$

or

$$\Delta_c = t_c/A - \frac{3}{2} (t_c/A)$$