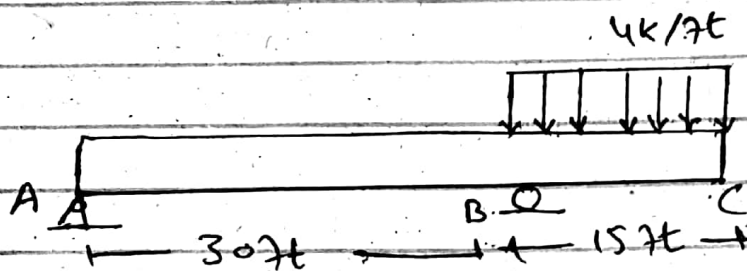


①

Assignment #03

Answer #07



Solution

Using the M/EI diagram & Elastic curve

$$\theta_C = (\theta_{C/A}) = \frac{1}{2} \left(\frac{4 \times 45}{EI} \right) (45) + \frac{2(4)45(45)}{EI} + \frac{1}{2} \left(\frac{4 \times 15}{EI} \right) (45) = \frac{1}{EI}$$

$$\theta_C = \frac{24300}{EI}$$

$$\Delta_C = \theta_{C/A} \left[\frac{1}{2} \left(\frac{4 \times 45}{EI} \right) (45) \right] \left[45 + \frac{2}{3}(45) \right] + \left[\frac{2(4)45(45)}{EI} \right] \left[45 + \frac{45}{2} \right] + \left[\frac{1}{2} \left(\frac{4 \times 45}{EI} \right) (45) \right] \left[\frac{2}{3}(45) \right] = 0$$

$$= \left(\frac{8100}{2EI} \right) (75) + \left(\frac{6200}{EI} \right) (67.5) + \left(\frac{8100}{2EI} \right) (30)$$

(2)

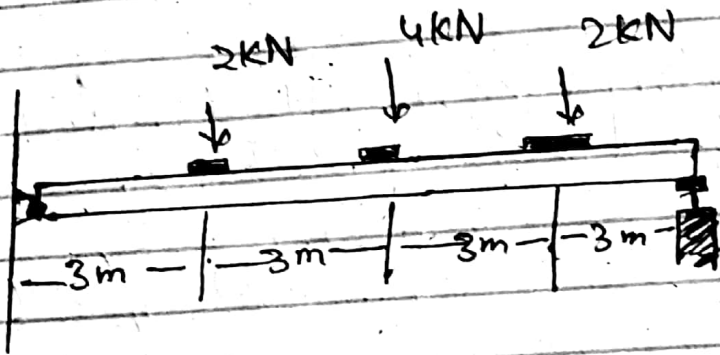
$$\Delta C = \frac{607500 + 1053500 + 243000}{6EI}$$

$$\Delta C = \frac{1944000}{6EI}$$

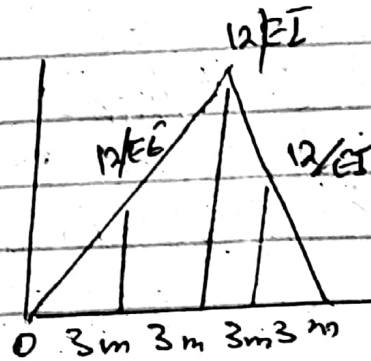
Ans

3

Answer #02



Solution



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

$$Q A/c = \frac{18}{EI} + \frac{36}{EI} + \frac{9}{EI}$$

$$Q A/c = \frac{63}{EI}$$

$$Q A/c = \frac{63}{(200 \times 10^6) (6 \times 10^6) (1000)^{-4}}$$

$$= \frac{63}{1200}$$

(1)

$$Q \quad A/c = 0.0525 \quad \text{radius}$$

$$Q \quad n = 0.0515$$

$$t \quad A/c = \left[\frac{1}{2} \left(\frac{12}{EI} \right) (3) \right] \left[\frac{2}{3} (3) \right] + \left[\frac{12}{EI} (3) \right] \left(3 + \frac{1}{2} (3) \right) \\ + \left[\frac{1}{2} \left(\frac{4}{EI} \right) (3) \right] \left(3 + 2 \left(\frac{1}{3} (3) \right) \right)$$

$$= 0.202 \text{ m}$$

$$\Delta C = t/A/c = 0.202$$

$$\Delta C = 202 \text{ mm} \quad \text{Ans}$$