

Name:

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ID#

7911

Section

"A"

Assignment #:

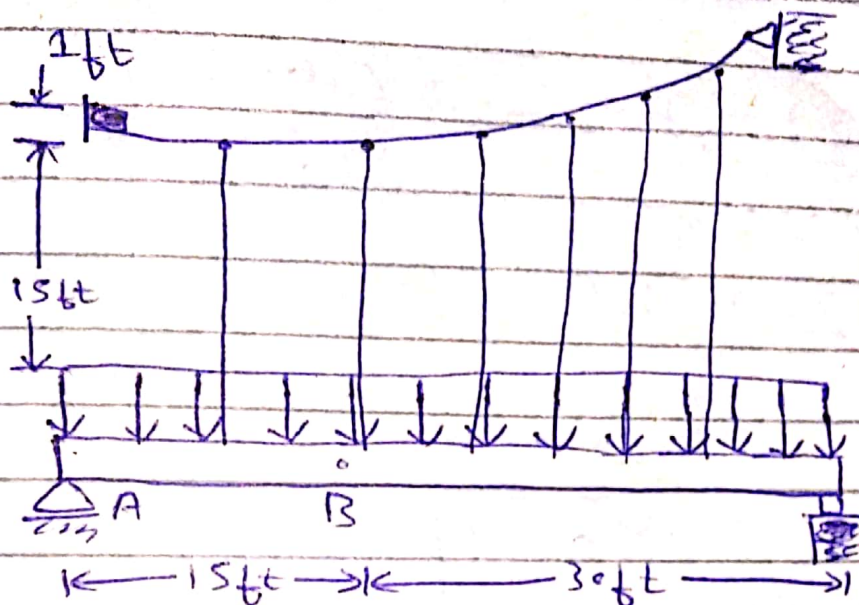
04

Subject:

Structure - Analysis I

# Question # 01

Solution:



Member BC:

$$\sum F_x = 0$$

$$B_x = 0$$

Member AB:

$$\sum F_x = 0$$

$$A_x = 0$$

Moment at A

$$\sum M_A = 0 \quad F_H(15) - B_y(15) - 45(4.5) = 0 = 0$$

FBD

$$\sum M_c^+ = 0 - F_H(10) - B_y(30) + (45)(30) = 0$$

$$F_H = 153.4 \quad B_y = 0$$

$$w_o = \frac{2F_H h}{30^2} = \frac{2(153.4)(10)}{30^2}$$

$$= \frac{3068}{900} = 3.40$$

$$w_o = 3.40 \text{ k/ft}$$

$$F_{\text{max}} = w_o L \sqrt{1 + \left(\frac{L}{24}\right)^2}$$

$$= 3.4(30) \sqrt{1 + \left(\frac{30}{24}\right)^2}$$

$$F_{\text{max}} = 183.6 \text{ k}$$

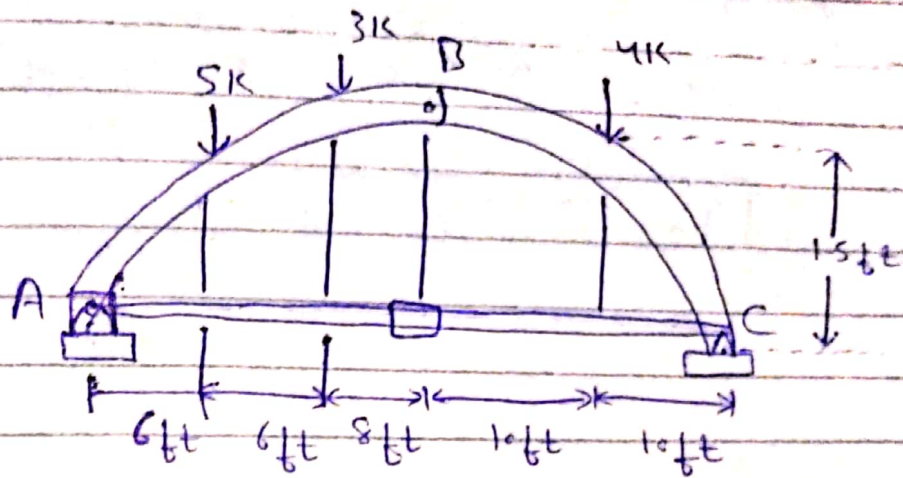
Each hanger carries 5ft of  $w_o$

$$T = (5\text{ft})(3.4 \text{ k/ft})$$

$$T = 17 \text{ k}$$

## Question No 2

Solution:



Entire arch:

$$+\circlearrowleft \sum M_A = 0$$

$$-4(6) - 3(12) - 5(30) + C_y(40) = 0$$

$$C_y = 5.25 \text{ k}$$

$$+\uparrow \sum F_y = 0$$

$$A_y + 5.25 - 4 - 3 - 5 = 0$$

$$A_y = 6.75 \text{ k}$$

$$\rightarrow \sum F_x = 0 \quad A_x = 0$$

Section BC:

$$\hookrightarrow \sum M_p = 0$$

$$-5(10) - T(15) + 5.25(20) = 0$$

$$\boxed{T = 3.6722}$$