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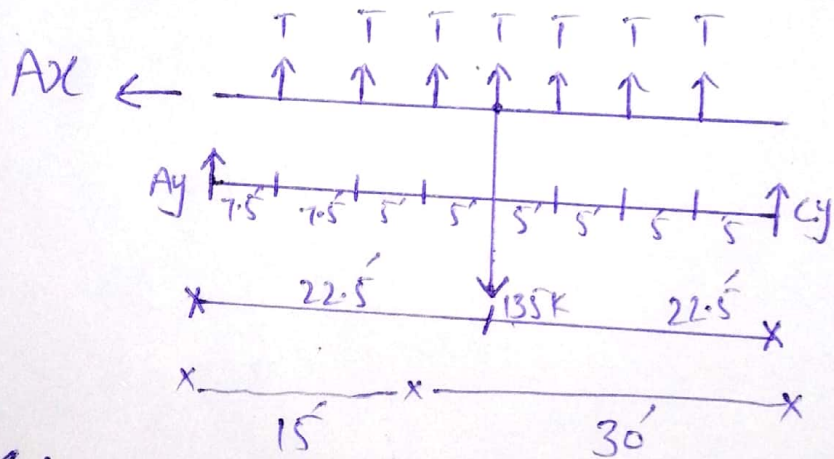
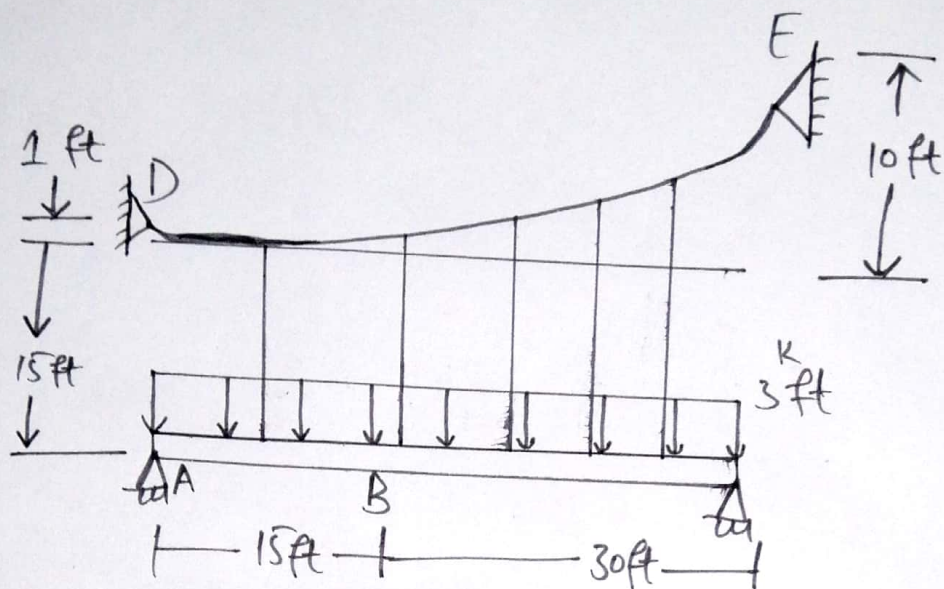
Section : A

Semester : 12 (Batch-14)

Assignment : 04

Submitted To : Engr. Amjad Islam

Q1:-



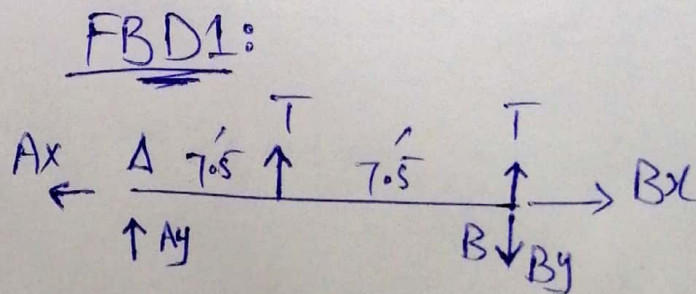
Member BC:

$$\begin{aligned} \rightarrow \sum F_x &= 0 \\ B_x &= 0 \end{aligned}$$

Member AB:

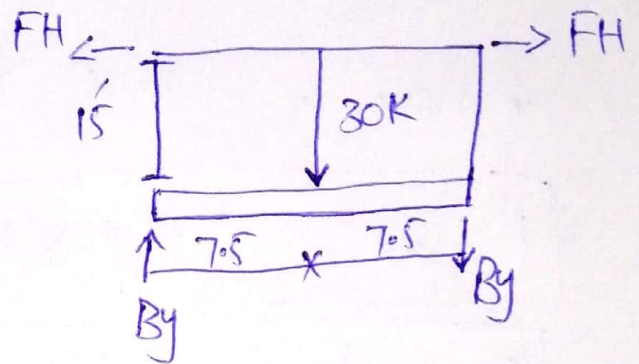
$$\begin{aligned} \rightarrow \sum F_x &= 0 \\ A_x &= 0 \end{aligned}$$

FBD1:



$$\hookrightarrow + \sum M_A = 0$$

$$FH(1) - By(15) - 45(7.5) = 0 \rightarrow$$



FBD 2:

$$\hookrightarrow + \sum M_c = 0$$

$$-FH(10) - By(30) + 90(15) = 0 \rightarrow \textcircled{2}$$

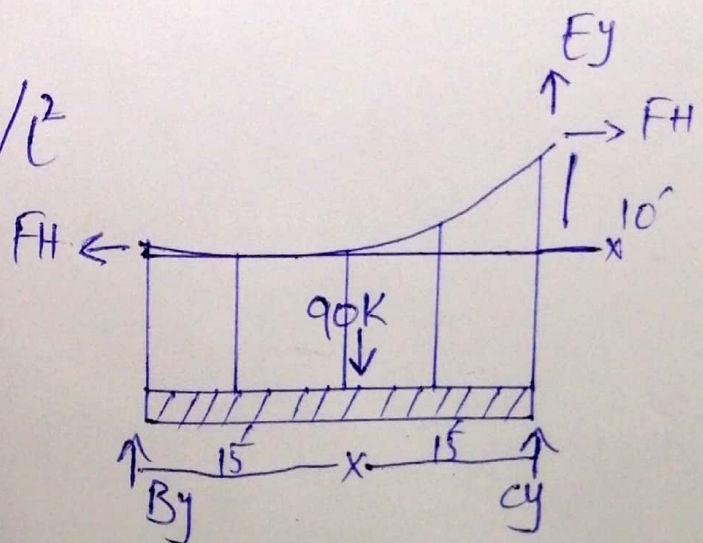
solving equation. ① & ② we get.

$$FH = 168.75 \text{ K}$$

$$By = 11.25 \text{ K}$$

Maximum cable force occur at Point "E" where slope is maximum.

So; $w_0 = 2 FH h/l^2$



$$w_0 = 2 (168.75) (10) / (30)^2 = 3.75 \text{ k/ft}$$

$$F_{\max} = w_0 L \sqrt{1 + \left(\frac{L}{2h}\right)^2}$$

$$F_{\max} = 3.75 (30) \sqrt{1 + \left(\frac{30}{2(10)}\right)^2}$$

$$F_{\max} = 202.8 \text{ K}$$

$$F_H = F_{\min} = 168.75 \text{ K}$$

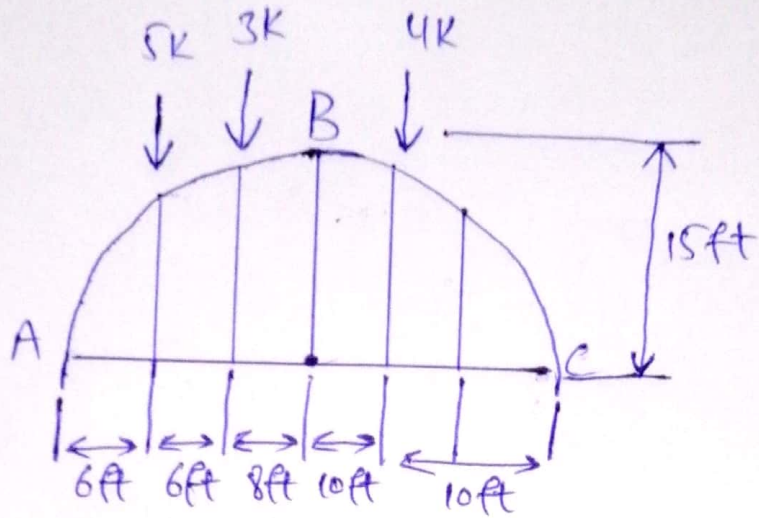
→ Each hangers carries 5 ft of w_0 except
The hanger b/w point "A" & "B"
which carry 7.5 ft.

So :-

$$T_5 = (3.75) (5) = 18.75 \text{ K}$$

$$T_{7.5} = (3.75) (7.5) = 28.125 \text{ K}$$

Q2:-



Entire Arch:

$$\hookrightarrow + \sum M_A = 0$$

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

$$\Rightarrow C_y = 4.65K$$

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

$$A_y + 4.65 - 5 - 3 - 4 = 0$$

$$\Rightarrow A_y = 7.35K$$

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

section BC:

$$\hookrightarrow + \sum M_B = 0$$

$$-4(10) - T(15) + 4.65(20) = 0$$

$$\boxed{T = 3.6K}$$

