DATE: _____

Name # Aimal Khan

ID # 7510

Subject # Structure _ I

Assignment # 4

Engr Amjad Islam

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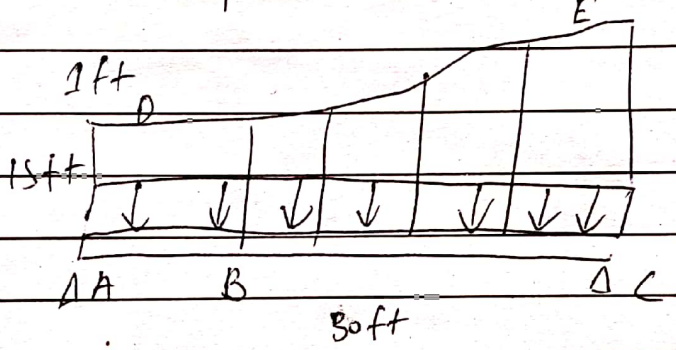
Assigment # 4

Cables and Arches

Question # 1

Determine the maximum ---- pin Connected at B.



Sol:

Member BC

$\rightarrow \sum f_x = 0$

$B_x = 0$

Member AB

$\rightarrow + \sum F_x = 0$

$A_x = 0$

Moment At A

~~$\circlearrowleft + \sum M_n = 0 \quad F_x(1) - B_y(30)$~~

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↳ $\sum M_n = 0$ $F_H(1) - B_y(15) - 45(7.5) = 0 \rightarrow (1)$
FBD

↳ $M_C^+ = 0 = -F_H(10) - B_y(30) + (45)(30) = 0$

$\boxed{F_H = 153.4}$ $B_y = 0$

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

$$= \frac{3063}{900} = 3.46$$

$\boxed{W_o = 3.40 \text{ k/ft}}$

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

$$= 3.4(30) \sqrt{1 + \left(\frac{30}{2(10)}\right)^2}$$

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

Each hunger Carries 5ft of wa

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

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

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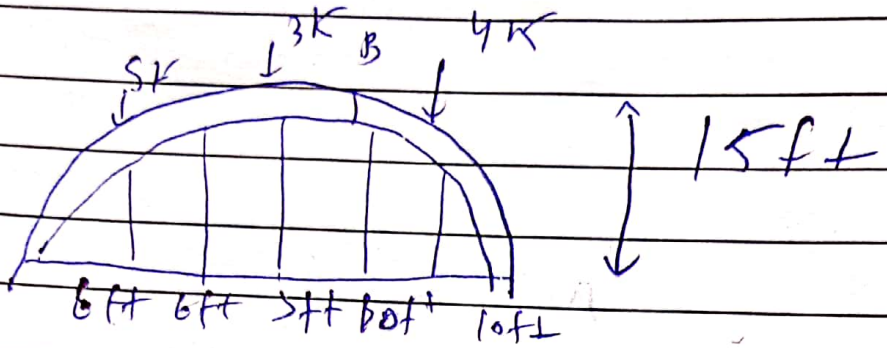
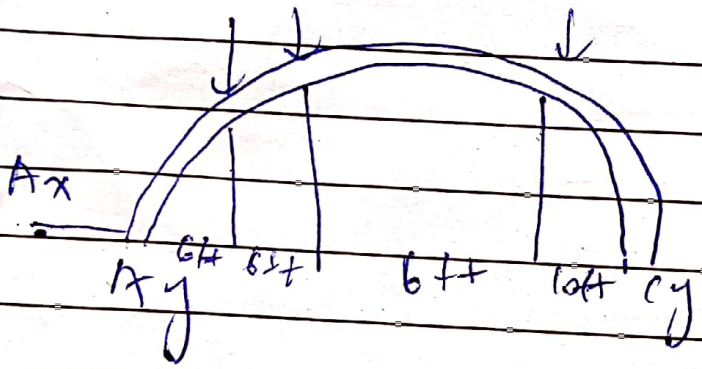
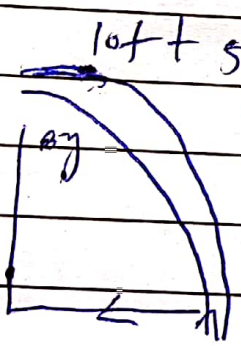
Question #2



Sol:-





Entire graph:-

$$\circlearrowleft^{+} \Sigma M_A = 0; \; -4(6) - 3(2)$$

$$-5(30) + y(46)$$

$$C_x = 5.2k$$

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$+\uparrow \Sigma F_y = 0$

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

$A_y = 6.75\ k$

$\overset{+}{\rightarrow} \Sigma F_y = 0 \quad A_x = 0$

Section BC :-

$(\overset{+}{\circlearrowright} \Sigma M_B = 0$

$-5(10) - T(15) + 5.25$

$(20) = 0$

$T = 3.67\ L$

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