NAME: Madina Kashar

I.D : 7935

SECTION: B

ASSIGNMENT: III

"STRUCTURE ANALYSIS"

Determine minimum and maximum tension ---- at B

SOLUTION:

Member BC:

$$\Sigma F_x = 0$$

$$B_x = 0$$

Member AB

$$\Sigma F_x = 0$$

$$A_x = 0$$

FBD 1:

$$\Sigma M_A = 0$$

$$F_H(1) - By(15) - 45(7.5) = 0$$

$$F_H - 15By - 337.5 = 0 \quad \text{— a}$$

FBD 2:

$$\Sigma M_C = 0$$

$$-F_H(10) - By(30) + 90(15) = 0$$

$$-10F_H - 30By + 1350 \quad \text{— b}$$

Solving a and b by multiply eq a by 10

$$10F_H - 150By - 3375 = 0$$

$$-10F_H - 30By + 1350 = 0$$

$$-180By - 2025 = 0$$

$$By = 11.25\,k$$

By putting in eq a

$F_H = 500.25K$

Max cable force occur at E where slope is maximum.

$$w_o = \frac{2F_H h}{l^2}$$

$$= \frac{2(500)(10)}{30^2}$$

$$= 11.25 \text{ lb/ft}$$

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

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

$F_{Max} = 18000K$

Each hanger 5ft of w_o

$T = 3K/ft \times 5ft$

$T = 15K.$

QUESTION No 2
The tied ---- in rod.

Solution:

$\Sigma M_A = 0$

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

$C_y = 4.65K$

$F_y = 0$

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

$A_y = 7.35$

$A_x = 0$

Section Bc

$\Sigma M_B = 0$

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

$T = 3.533K$