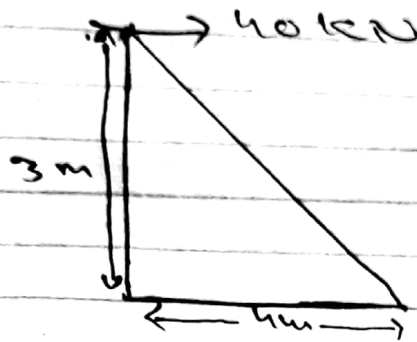


Q = Determine the force in each member of the truss and state whether it is tension or compression.

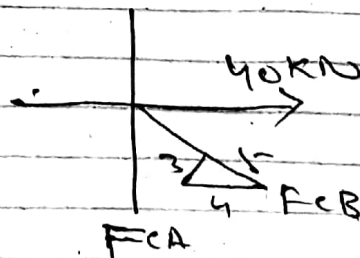
Sol.

[Given data]



First of all we Analyze Joint

So



$$\Rightarrow \sum F_x = 0$$

$$40 - F_{CB} \left(\frac{4}{5}\right) = 0$$

$$F_{CB} = 50 \cdot 0.6 \text{ KN (C)}$$

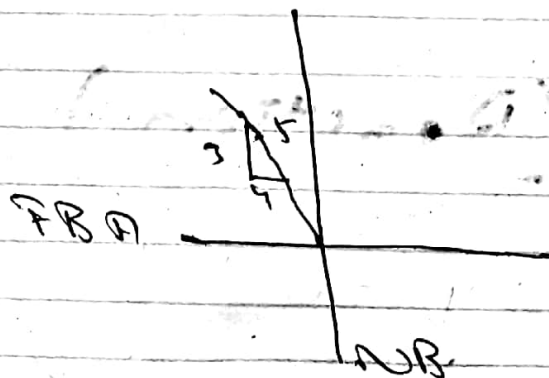
$$+\uparrow \sum F_y = 0$$

$$\text{So } (3/5) - F_{CA} = 0$$

$$F_{CA} = 30 \cdot 0.6 \text{ KN (T)}$$

Now we Analyze Joint

(B)



$$\rightarrow \sum F_x = 0 \quad \text{So } (4/5) - F_{BA} = 0$$

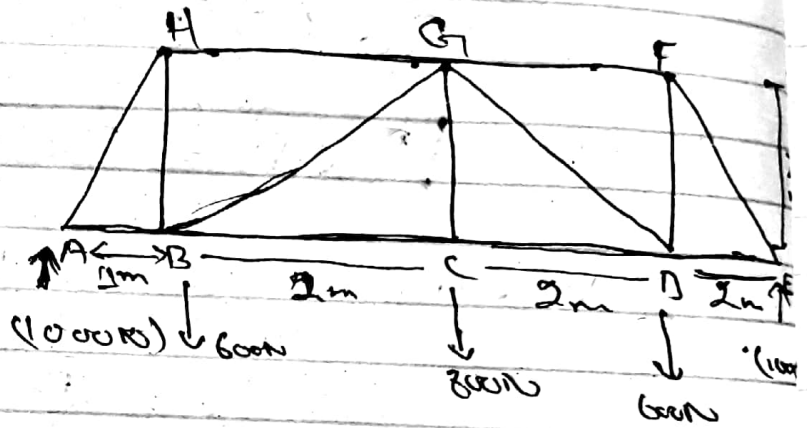
$$F_{BA} = 40 \cdot 0.6 \text{ KN (T)}$$

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

$$N_B - 50 \cdot (3/5) = 0$$

$$N_B = 30 \cdot 0.6 \text{ KN (up)}$$

Q2
(Given)



(Sum)
(Reaction)

$$\sum F_y = 0$$

$$-6000 - 8000 - 6000 + A_y + E_y = 0$$

$$A_y + E_y = 20000 \text{ N}$$

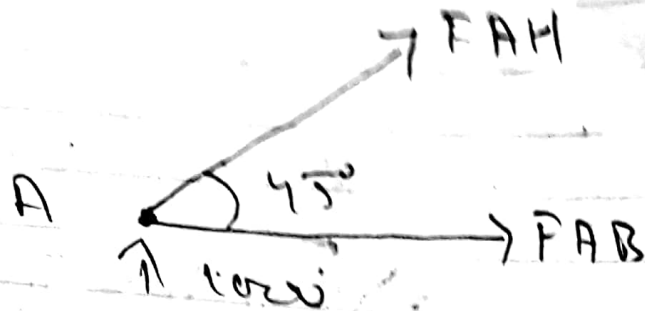
$$\therefore A_y = E_y = 10000 \text{ N}$$

(Joint A)

$$\sum F_y = 0$$

$$\Rightarrow 10000 - F_{AH} \sin 45^\circ = 0$$

$$F_{AH} = 1414 \cdot 21 \text{ N (c)}$$

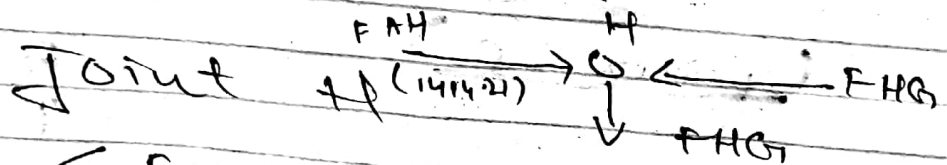


$$\sum F_x = 0$$

$$\Rightarrow F_{AB} = 1414 \cdot 21 \cos(45^\circ) = 0$$

$$F_{AB} = 1000 \text{ N (T)}$$

Now



$$\sum F_x = 0$$

$$-F_{HG} + 1414 \cdot 21 \sin(45^\circ) = 0$$

\therefore

$$F_{HG} = 1000 \text{ N (c)}$$

$$\sum F_y = 0$$

$$-F_{HB} + 1414 \cdot 21 \cos(45^\circ) = 0$$

$$F_{HB} = 1000 \text{ N (c)}$$

(Point B)

$$\sum F_y = 0$$

$$- F_{BC} \sin(45^\circ) + 1000 - 600 = 0$$

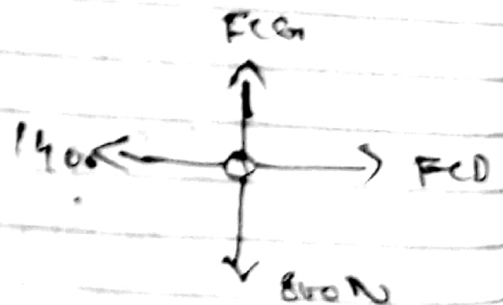
$$\Rightarrow F_{BC} = 565.68 \text{ N (C)}$$

$$\sum F_x = 0$$

$$F_{BC} - 1000 - 565.68 \cos(45^\circ) = 0$$

$$\Rightarrow F_{BC} = 1400 \text{ N}$$

(Point C)



$$\sum F_x = 0$$

$$F_{CD} - 1400 = 0$$

$$F_{CD} = 1400 \text{ (T)}$$

$$\sum F_y = 0$$

$$F_{CG} + 800 = 0$$

$$F_{CG} = 8000 \text{ N (T)}$$

Due to symmetry

$$F_{BC} = F_{CD} = 14000 \text{ N (T)}$$

$$F_{DG} = F_{BG} = 565.68 \text{ N (C)}$$

$$F_{FD} = F_{HB} = 10000 \text{ N (T)}$$

$$F_{FG} = F_{HG} = 10000 \text{ N (C)}$$

$$F_{ED} = F_{AB} = 10000 \text{ N (T)}$$

$$F_{EF} = F_{AH} = 1414.21 \text{ N (C)}$$