

NAME :- SADEEQ AFRIDI

ID => 7913

Section => A

Date :- 12/07/2020

Dept :- B.S civil Engineering

Assignment # 02

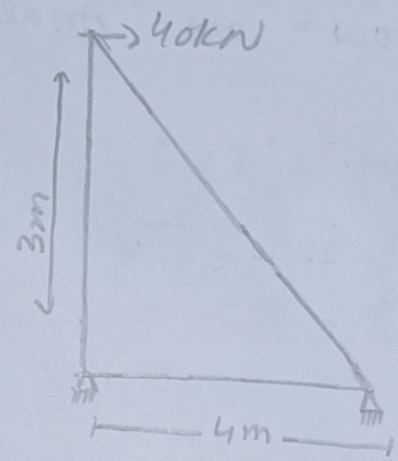
---

①

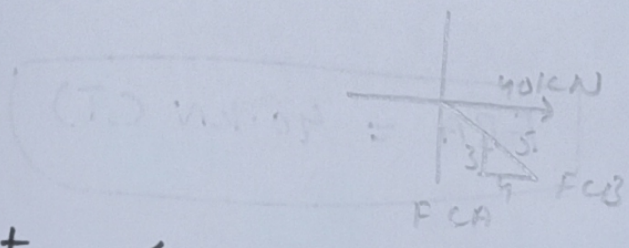
Q#2:- Determine the force in each member of the truss and state whether it is tension or compression:-

Sol:-

Given Data:-



First of all we analyze Joint C  
So,



$$\rightarrow \sum F_x = 0$$

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

$$F_{CB} = 50.0 \text{ kN (C)}$$

p. t o

$$\sum F_y = 0$$

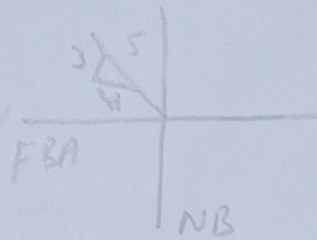
(2)

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

$$50(3/5) - F_{CA} = 0$$

$$F_{CA} = 30.0 \text{ kN (T)}$$

Now we analyze Joint (B)



$$+\rightarrow \sum F_x = 0 \quad 50(4/5) - F_{BA} = 0$$

$$F_{BA} = 40.0 \text{ kN (T)}$$

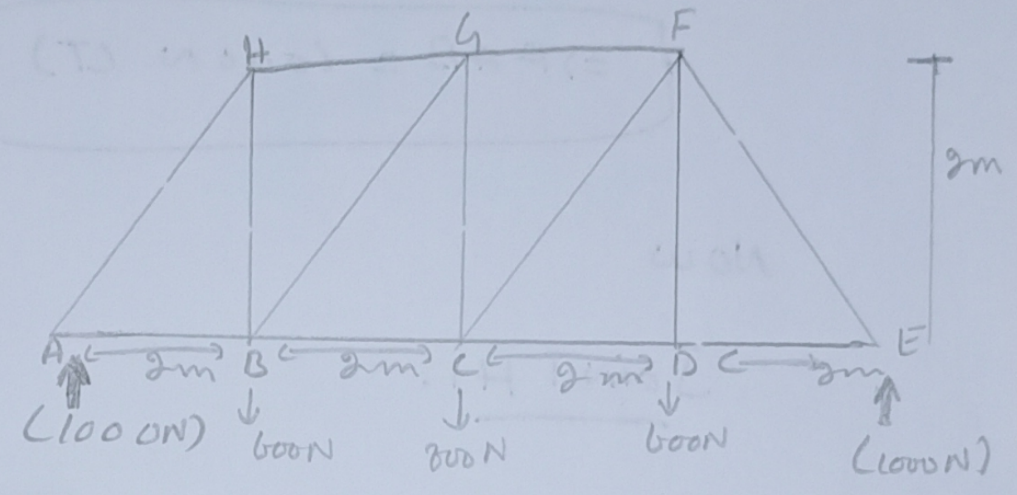
$$+\uparrow \sum F_y = 0$$

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

$$N_B = 30.0 \text{ kN} \quad \text{Ans.}$$

Q#2:

Given..



Sol.

Reactions:

$$\sum F_y = 0$$

$$-600 - 800 - 600 + A_y + E_y = 0$$

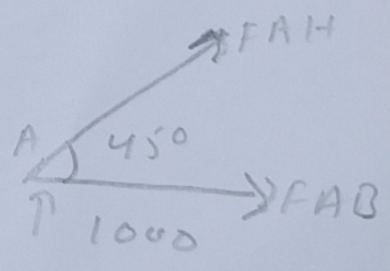
$$A_y + E_y = 2000 \text{ N} \quad \therefore A_y = E_y = 1000 \text{ N}$$

JOINT A:

$$\sum F_y = 0$$

$$\Rightarrow 1000 - F_{AH} \sin 45^\circ = 0$$

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



(4)

$$\sum F_x = 0$$

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

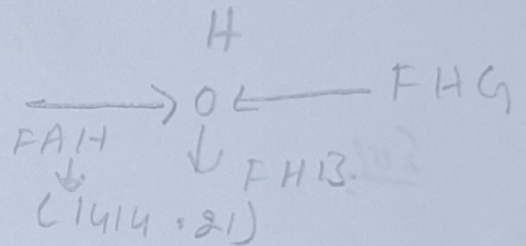
$$\Rightarrow F_{AB} = 1000 \text{ N (T)}$$

Now

Joint H.

$$\sum F_x = 0$$

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



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

$$\sum F_y = 0$$

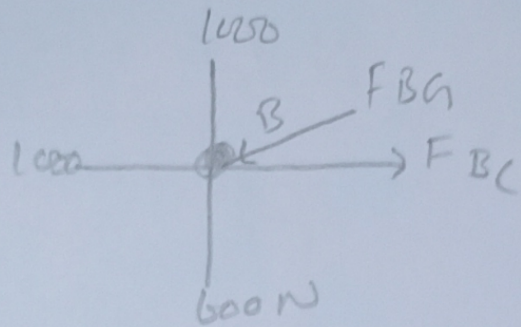
$$-F_{HB} + 1414 \cdot 21 \cos(45^\circ) = 0$$

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

$\uparrow$   $t$   $\delta$

5)

JOINT B:-



$$\sum F_y = 0$$

$$- F_{BG} \sin(45) + 1000 - 600 = 0$$

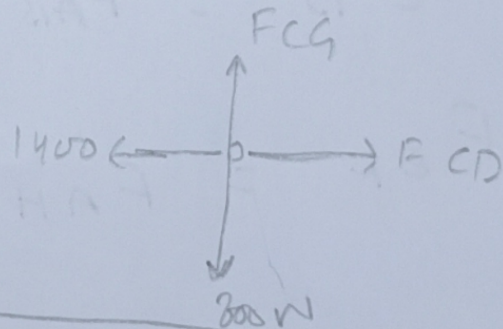
$$\Rightarrow \boxed{F_{BG} = 565.68 \text{ N (C)}}$$

$$\sum F_x = 0$$

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

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

JOINT C:-



$$\sum F_x = 0$$

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

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

(B)

$$\sum F_y = 0$$

$$\therefore F_{CG} - 800 = 0$$

$$\Rightarrow F_{CG} = 800 \text{ N (T)}$$

Due to symmetry

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

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

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

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

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

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

