

Name

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ID

7921

Structure.1

0

Section

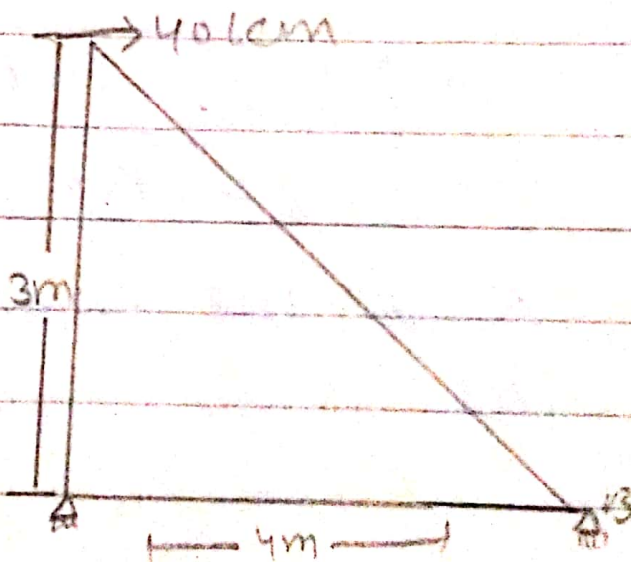
A

Question #01

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

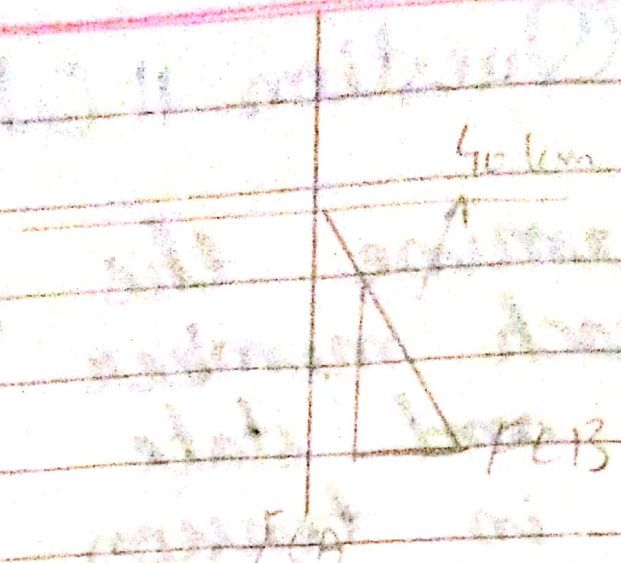
Solution :-

Given That



first of all we analysis joint (C)

So,



$$\rightarrow \sum F_x = 0$$

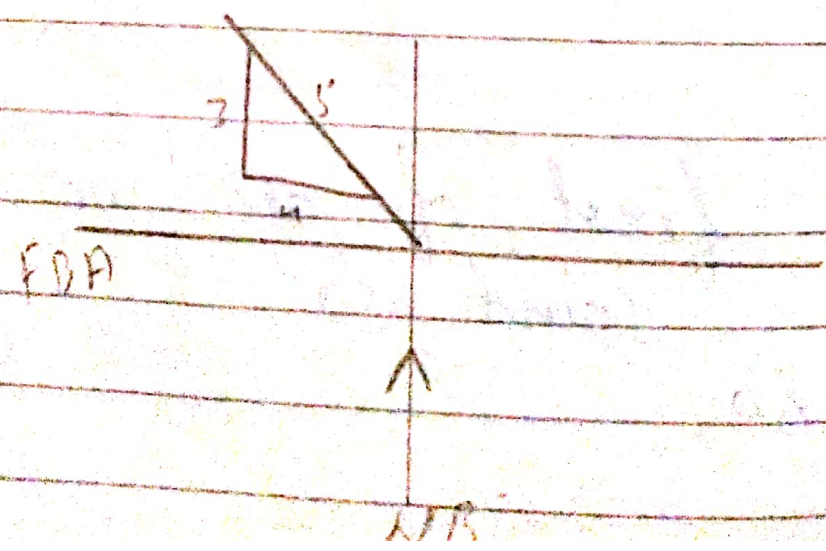
$$40 - F_{CB} \left(\frac{4}{5}\right) = 0$$

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

$$+\uparrow \left(\frac{3}{5}\right) - F_{CA} = 0$$

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

Now we analysis joint (B)



$$\rightarrow \sum F_x = 0 \quad 50 - \left(\frac{4}{5}\right) - F_{BA} = 0$$

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

$$+\uparrow \sum E_y = 0 \quad N_B - 50 \cdot \left(\frac{3}{5}\right) = 0$$

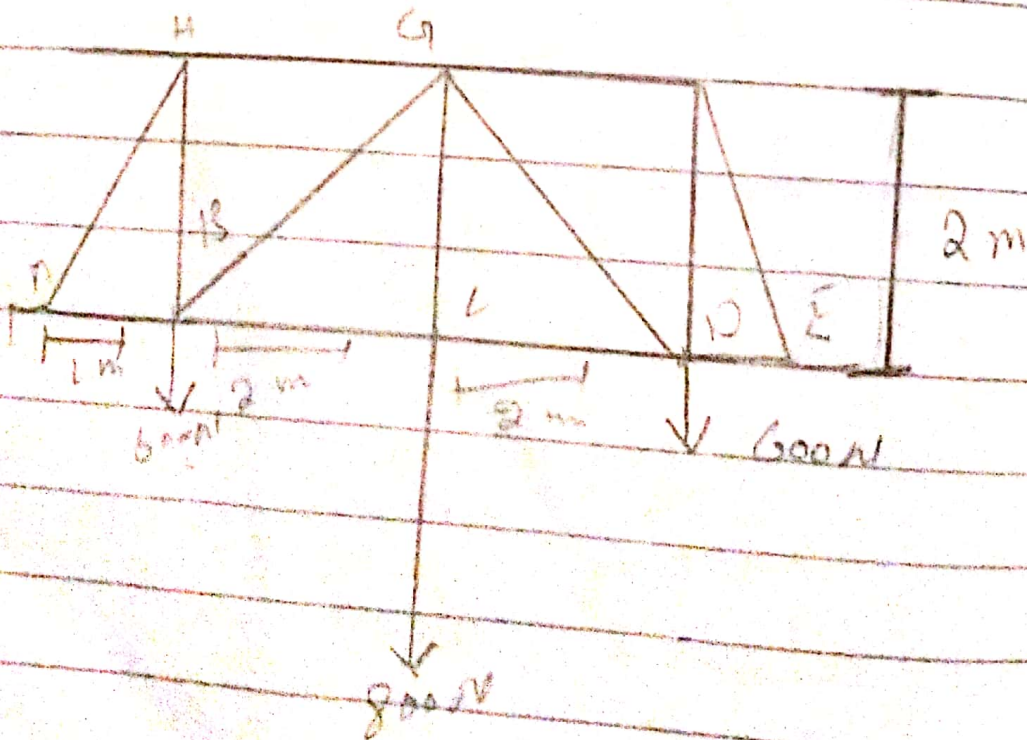
$$N_B = 30.0 \text{ kN}$$



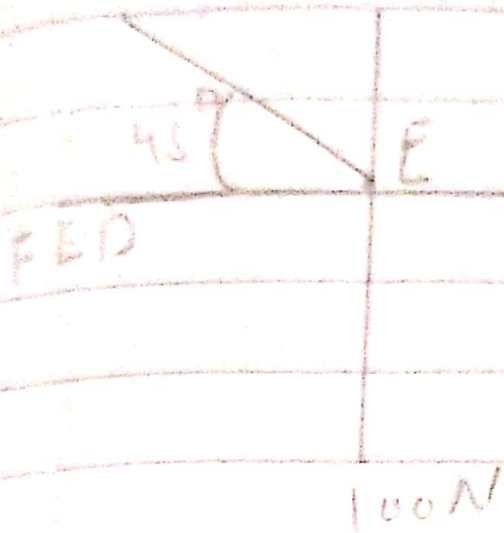
Question #2

Determine the force in each member of the truss - indicate if the members are in tension or compression. Assume all members are pin connected.

Solution:



Now we analysis
joint (E)



$$+\uparrow \sum EY = 0$$

$$1000 - FEF \sin 45^\circ = 0$$

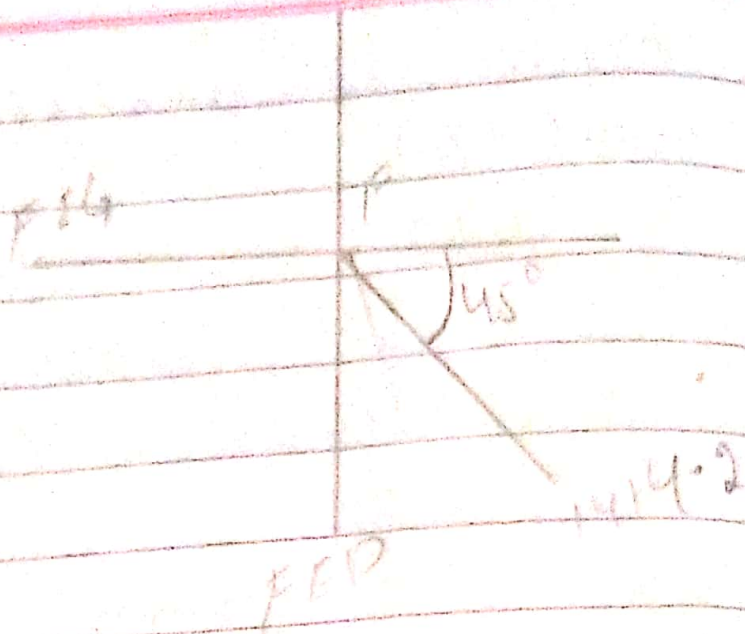
$$F_{EF} = 1414.21 \text{ N (C)} = 1.41 \text{ kN (C)}$$

$$\rightarrow \sum F_x = 0$$

$$1414.21 \cos 45^\circ - F_{ED} = 0$$

$$F_{ED} = 1000 \text{ N (T)} = 1 \text{ kN (T)}$$

Joint (F)



$$\rightarrow \sum F_x = 0$$

$$F_{FG} - 1414 \cdot 2 \cos 45^\circ = 0$$

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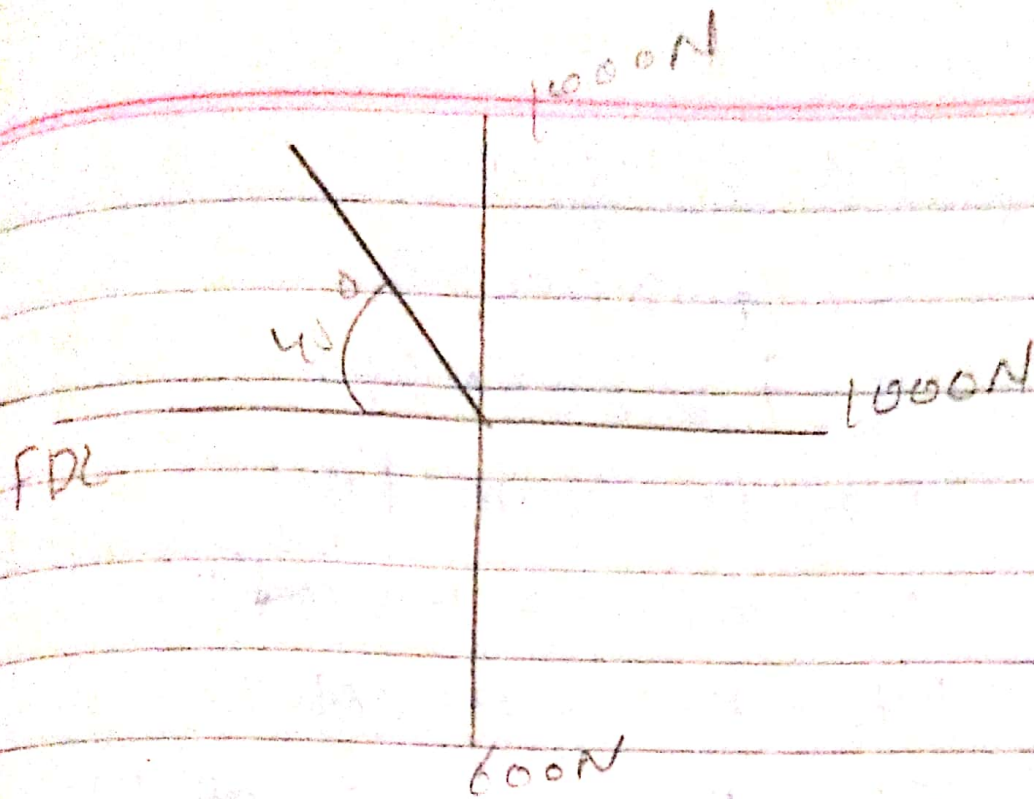
$$F_{FG} = 1000 \text{ N (C)} = 1 \text{ kN (C)}$$

$$\uparrow \sum F_y = 0$$

$$1414 \cdot 2 \sin 45^\circ - F_{FD} = 0$$

$$F_{FD} = 1000 \text{ N (T)} = 1 \text{ kN (T)}$$

Joint (D)



$$\uparrow \sum F_y = 0$$

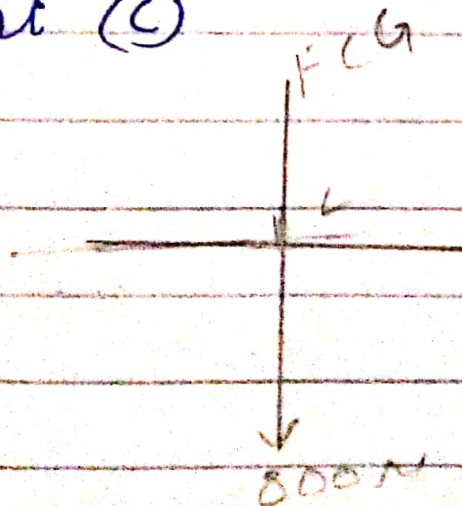
$$1000 - 600 - F_{DL} \sin 45^\circ = 0$$

$$F_{DL} = 565.59 \text{ N (C)} = 566 \text{ N (C)}$$

$$\rightarrow \sum F_x = 0 ; 1000 + 565.59 \cos 45^\circ - F_{CL} = 0$$

$$F_{CL} = 1400 \text{ N (T)} = 1.4 \text{ kN (T)}$$

joint (C)



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

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

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

Due to symmetry

$$F_{BC} = F_{DC} = 1.41 \text{ kN (T)}$$

$$F_{HB} = F_{HD} = 1.00 \text{ kN (T)}$$

$$F_{BG} = F_{DG} = 5.066 \text{ kN (T)}$$

$$F_{HG} = F_{FG} = 1.0 \text{ kN (C)}$$

$$F_{AH} = F_{EH} = 1.41 \text{ kN (C)}$$

$$F_{AB} = F_{ED} = 1.0 \text{ kN (T)}$$

x ————— y

* ————— *