

NAME

ADIL AZAR

Section

A

I.D

7889

Subject

Structure - I

Assignment

02

Date

11 July 2020

Submitted

To:

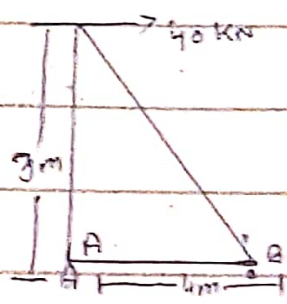
Sir Amjid Islam

### Question No # 01.

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

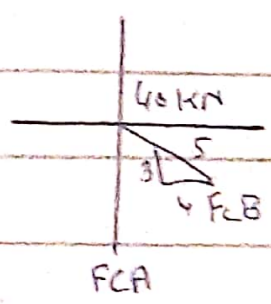
Solution:-

Given data-



First of all we analysis Joint C

So,



$$\rightarrow \sum F_x = 0$$

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

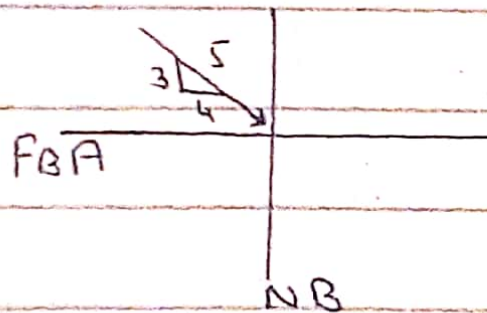
$$F_{CB} = 50.0 \text{ kN (C)}$$

$$\uparrow \sum F_y = 0$$

$$50 \left( \frac{3}{5} \right) - F_{CA} = 0$$

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

Now we analysis joint (B).



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

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

$$\uparrow \sum F_y = 0$$

$$N_B - 50 \left( \frac{3}{5} \right) = 0$$

$NB = 30.0 \text{ kN}$



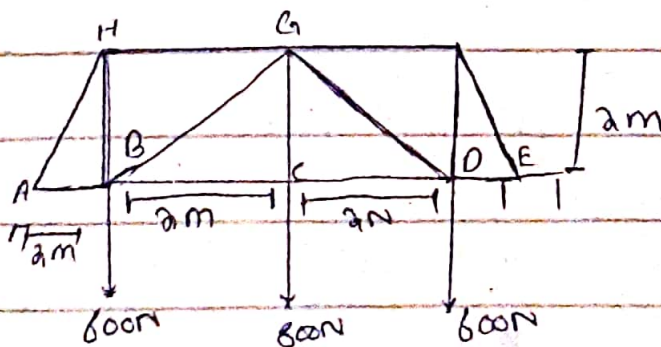
Question # 02.

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

~~Solution~~

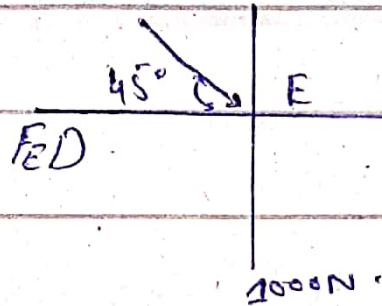
Solution:

Given that:-



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Now we analysis joint (E)



$$+\uparrow \sum E_y = 0;$$

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

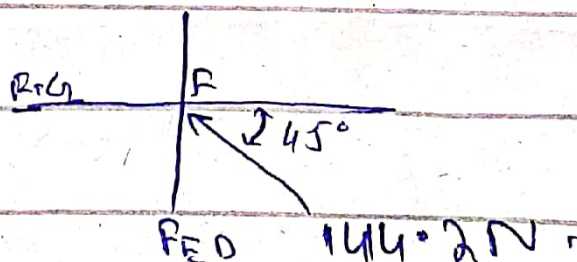
$$F_{EF} = 1414.21 \text{ N (C)} = 1.414 \text{ kN (C)}$$

$$+\rightarrow \sum F_x = 0$$

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

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

Joint (F)



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$$\rightarrow \sum F_x = 0$$

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

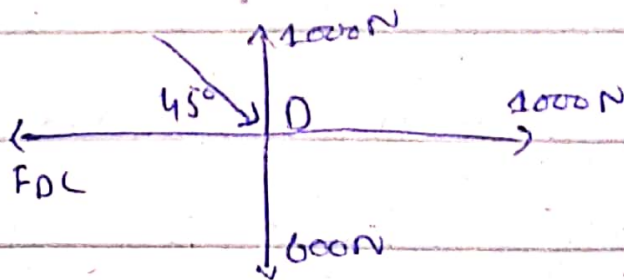
$$F_{FG} = 1000 \text{ N (C)} = 1 \text{ kN (C)}$$

$$\uparrow \sum F_y = 0;$$

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

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

Joint (D)



$$\uparrow \sum F_y = 0$$

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

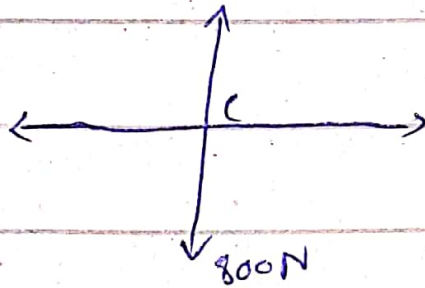
$$F_{DG} = 565.69 \text{ N (C)} = 566 \text{ N (C)}$$

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

$$F_{DC} = 1400 \text{ N (T)} = 1.4 \text{ m (T)}$$

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Joint (C)



$$\uparrow \sum F_y = 0$$

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

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

Due to symmetry

$$F_{BC} = F_{DC} = 1.4 \text{ kN (T)}$$

$$F_{HB} = F_{HD} = 1.0 \text{ kN (T)}$$

$$F_{BG} = F_{DG} = 5.66 \text{ N (T)}$$

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

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

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

