

NAME: OWAIS USMAN

SECTION: "A"

ID: 7897

SUBJECT: STRUCTURE - I

ASSIGNMENT: 02

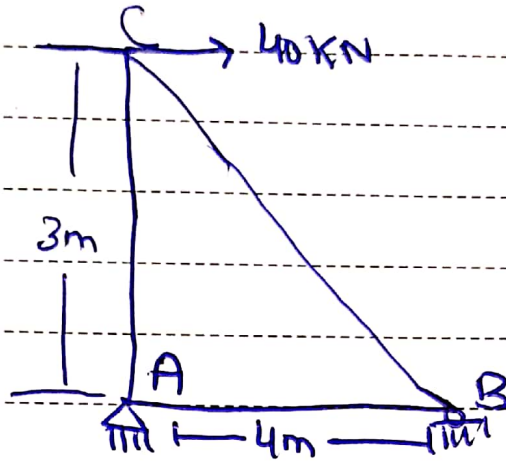
SUBMITTED TO: SIR AMJID ISLAM

DATE: 1st JULY 2020

QUESTION #01

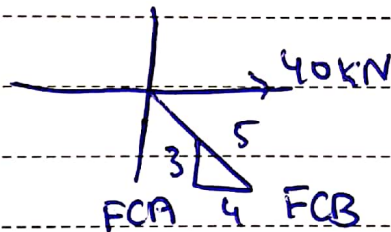
SOLUTION:

Given that



First of all we analysis joint C

S_0



\rightarrow

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

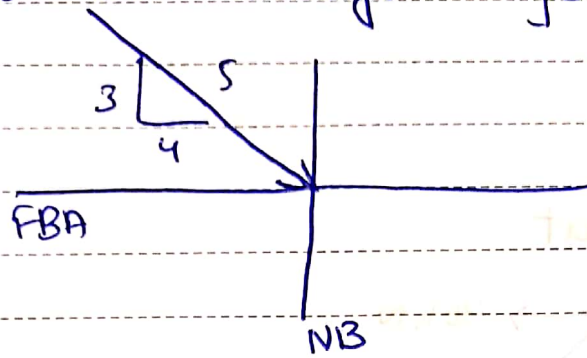
$$F_{CB} = 50.0 \text{ kN (C)}$$

\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)



$$\rightarrow \sum F_x = 0$$

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

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

$$\uparrow \sum F_y = 0$$

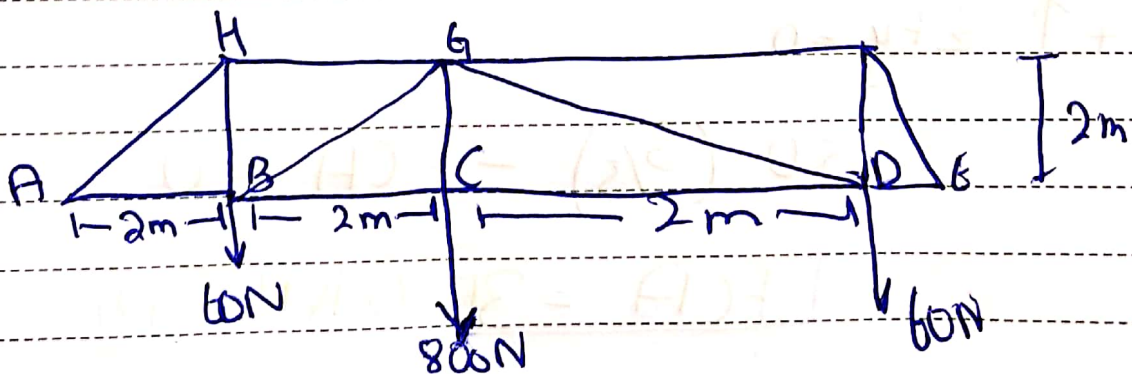
$$N_B - 50 \cdot \left(\frac{3}{5}\right) = 0$$

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

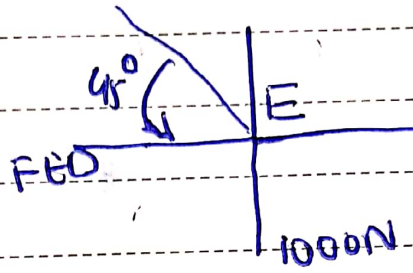
QUESTION: 2

SOLUTION:

Given that



Now we analyse Joint (E)



$$\uparrow \sum F_y = 0$$

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

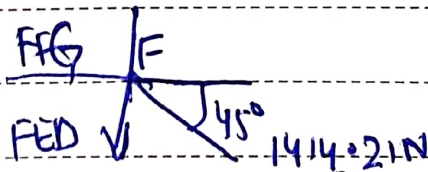
$$F_{EF} = 1414.2 \text{ N (C)} = 1.4 \text{ kN (C)}$$

$$\rightarrow \sum F_x = 0;$$

$$1414.2 \cos 45^\circ - F_{ED} = 0$$

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

Joint (F)



$$\rightarrow \sum F_x = 0$$

$$F_{FG} - 1414.2 \cos 45^\circ = 0$$

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

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

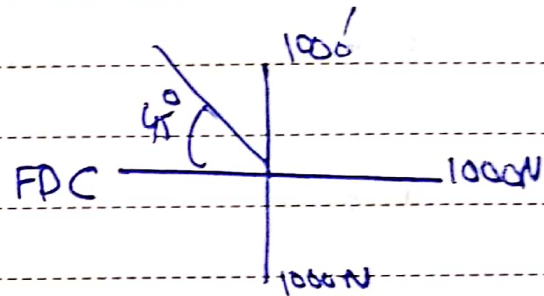
$$1414.21 \sin 45^\circ - F_{ED} = 0$$

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

Joint D

$$\uparrow \sum F_y = 0$$

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



$$\boxed{F_{DG} = 505.69 \text{ N (C)} = 566 \text{ N (C)}}$$

$$\rightarrow \sum F_x = 0$$

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

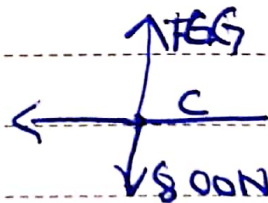
$$\boxed{F_{DC} = 1400 \text{ N (T)} = 1.4 \text{ kN (T)}}$$

Joint (C)

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

$$F_{CG} - 300 = 0$$

$$\boxed{F_{CG} = 300 \text{ N (T)}}$$



Due to symmetry

$$F_{BC} = F_{DC} = 1.9 \text{ kN (T)}$$

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

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

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

$$F_{AH} = F_{EF} = 1.141 \text{ kN (C)}$$

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

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END