

ARSA LAN KHAN

I.D NO

7614

SECTION

A

SUBMITTED TO

ENGR. AMJID ISLAM

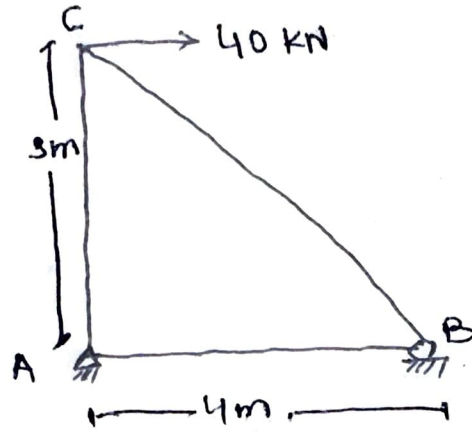
ASSIGNMENT #

02

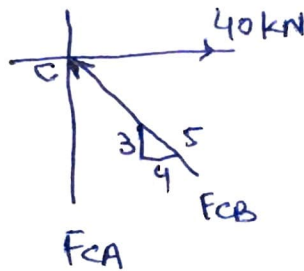
DATE

12 - July - 2020

Q1: Determine the force in each member of the truss and state whether it is in tension or compression. ①



First of all analyse joint (c) So;



$$\rightarrow \sum F_x = 0$$

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

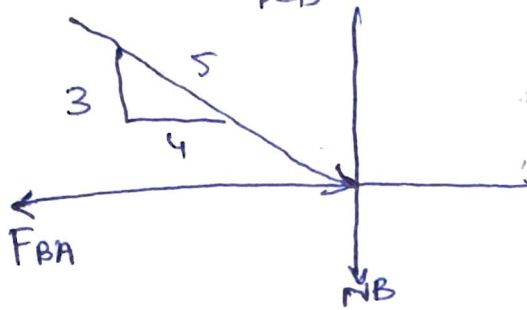
$$F_{CB} = 50.0 \text{ kN (c)}$$

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

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

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

Now we analyze joint \textcircled{B}



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

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

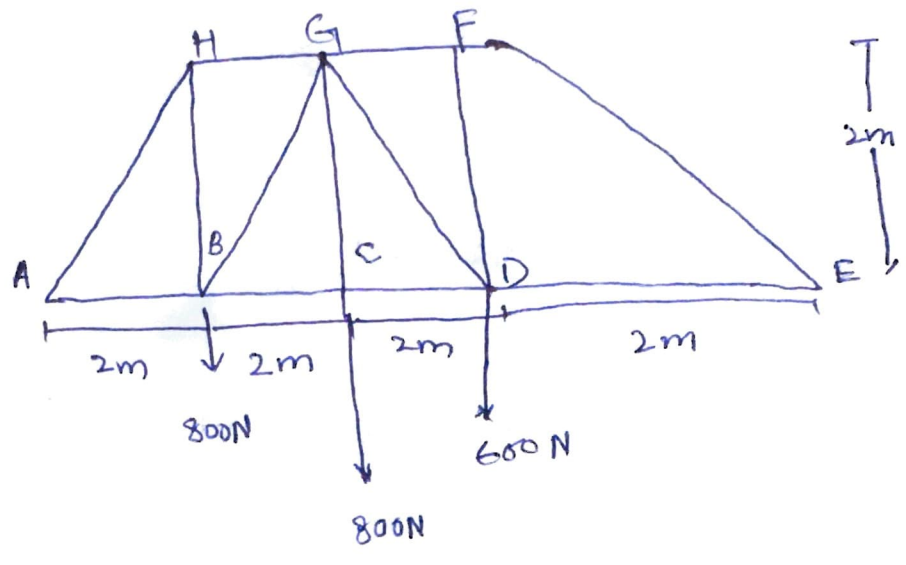
$$+\uparrow \sum F_y = 0$$

$$N_B = 50.0 \left(\frac{3}{5} \right) - 0$$

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

Answer.

Q 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.

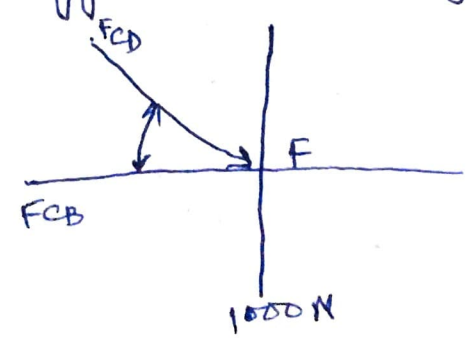


$$\sum M_A = 0$$

$$E_y (8) - 600(2) - 800(4) - 600(6) = 0$$

$$E_y = 1000 \text{ N}$$

Now analyze the joint B



$$+\uparrow \Sigma F_y = 0$$

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

$$F_{CF} = 1414.21 \text{ N (c)}$$

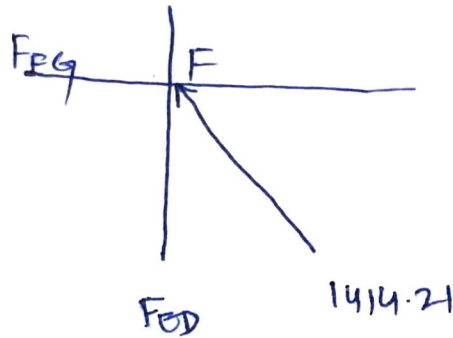
$$\Rightarrow 1.41 \text{ kN (c)}$$

$$+\rightarrow \Sigma F_x = 0$$

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

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

Joint F



$$+\rightarrow \Sigma F_x = 0$$

$$F_{FG} = 1414.21 \text{ N} \cos 45^\circ = 1000$$

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

$$F_{FG} = 1 \text{ kN (c)}$$

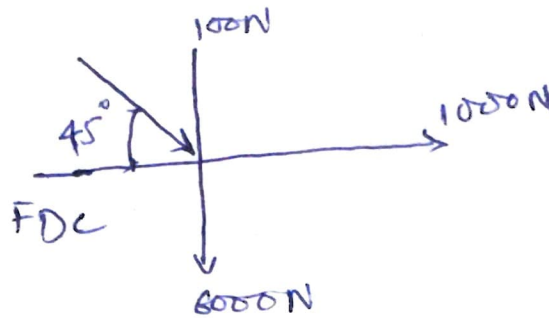
$$+\uparrow \sum F_y = 0$$

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

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

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

Joint D:



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

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

$$F_{DG} = 565.69 \text{ N}$$

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

$$\rightarrow \sum F_x = 0$$

$$1000 + 565.69 \cos 45^\circ - F_{DC} = 0$$

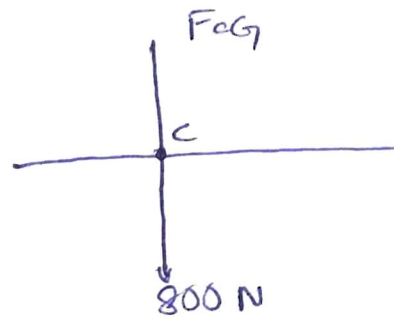
$$F_{DC} = 1400 \text{ (T)} = 1.4 \text{ kN (T)}$$

Joint c ;

$$\sum F_y = 0$$

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

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



Due to Symmetry;

$$F_{Bc} = F_{Dc} = 1.4 \text{ kN (T)}$$

$$F_{Hb} = F_{Ed} = 1.0 \text{ kN (T)}$$

$$F_{Bc} = F_{Dc} = 5.66 \text{ kN (T)}$$

$$F_{Hc} = F_{cG} = 1.0 \text{ kN (T)}$$

$$F_{AH} = F_{EP} = 1.41 \text{ kN (T)}$$

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

