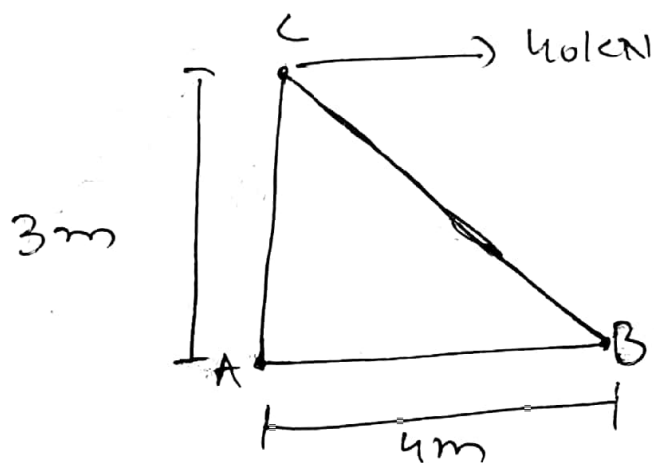


Q1 Determine the force in each member of the truss and state whether it is in tension or compression



Solution

Joint B

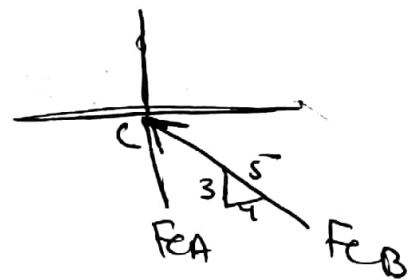
$$\sum F_x = 0,$$



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

$$F_{CB} = 50.0 \text{ kN}$$

$$\sum F_y = 0,$$



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

$$F_{CA} = 30 \text{ kN}$$

Joint B

$$\sum F_x = 0,$$

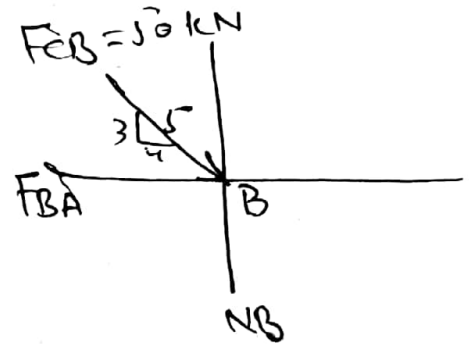
$$50 \left(\frac{4}{5}\right) - F_{BA} = 0$$

$$F_{BA} = 40 \text{ kN}$$

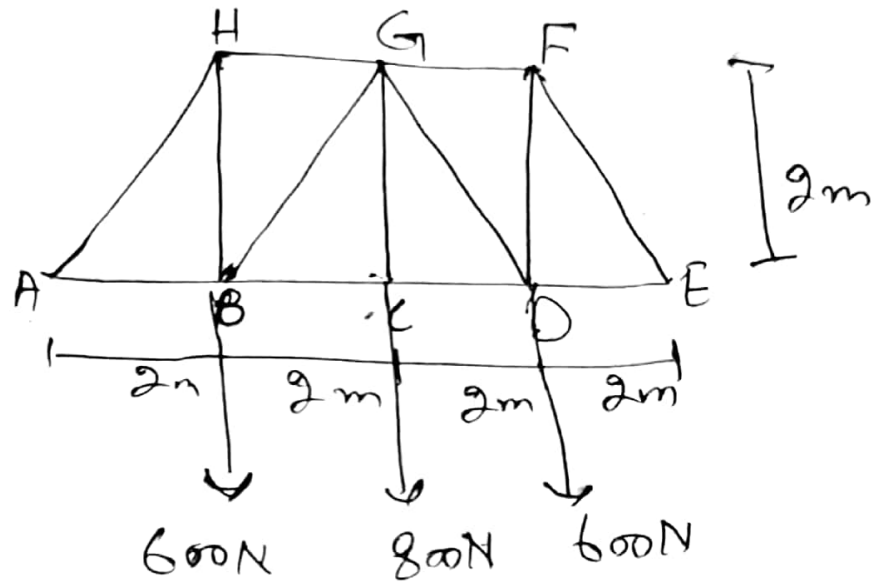
$$\sum F_y = 0,$$

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

$$N_B = 30 \text{ kN}$$



Q2



Solution

As we know that
 $\sum M_A = 0$

Joint E :- $E_y(8) - 600(2) - 800(4) - 600(6) = 0$
 $E_y = 1000 \text{ N}$

$$\sum F_y = 0,$$

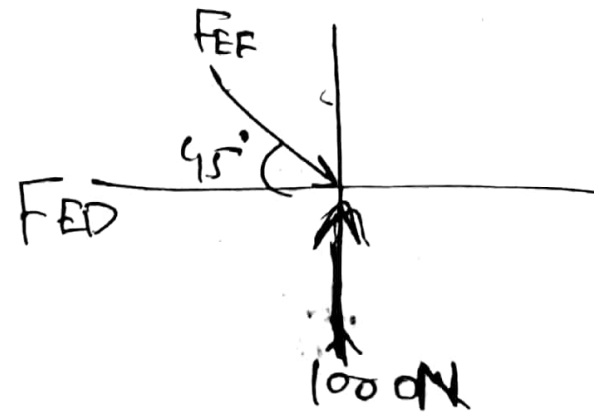
$$1000 - F_{EF} \sin 45^\circ = 0$$

$$F_{EF} = 1414 \text{ kN}$$

$$\sum F_x = 0,$$

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

$$F_{ED} = 1.00 \text{ kN Ans.}$$

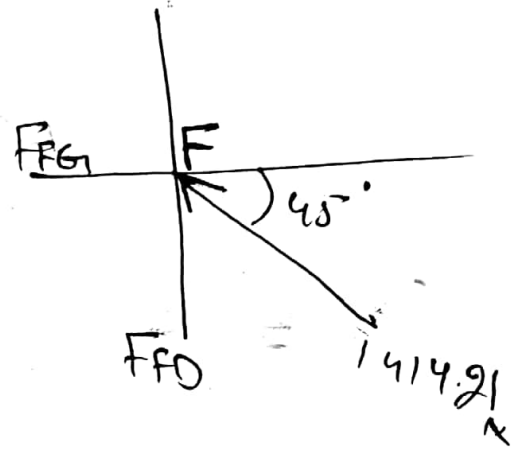


Joint F

$$\rightarrow \Sigma F_x = 0$$

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

$$F_{FG} = 1.001 \text{ kN}$$



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

$$1414.2 \sin 45^\circ - F_{FD} = 0$$

$$F_{FD} = 1.001 \text{ kN}$$

Joint D

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

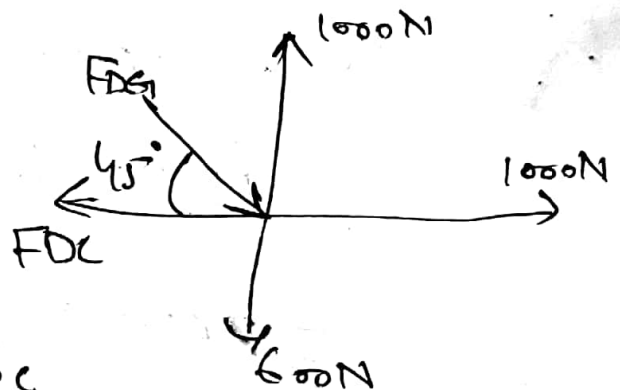
$$1000 - 600 - F_{DG} \sin 45^\circ = 0$$

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

$$\rightarrow \Sigma F_x = 0$$

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

$$F_{DC} = 1400 \text{ N} = 1.40 \text{ kN}$$



Joint C

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

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

$$F_{CG} = 800 \text{ N}$$

Due to Symmetry

$$F_{BC} = F_{DC} = 1.40 \text{ kN}$$

$$F_{BG} = F_{DG} = 556 \text{ N}$$

$$F_{HG} = F_{FG} = 1.00 \text{ kN}$$

$$F_{HB} = F_{HD} = 1.00 \text{ kN}$$

$$F_{AH} = F_{EF} = 1.41 \text{ kN}$$

$$F_{AB} = F_{ED} = 1.00 \text{ kN}$$

