

MUHAMMAD AZAN OAZI

7894

Sec A

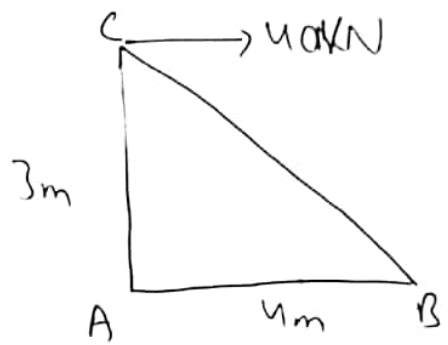
Civil Engineering Department

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Q.No (1)

Page (1)



First we will start from Joint C.

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

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

$$F_{CB} = 50 \text{ kN} \quad \text{Compression}$$

$$\uparrow \sum F_y = 0.$$

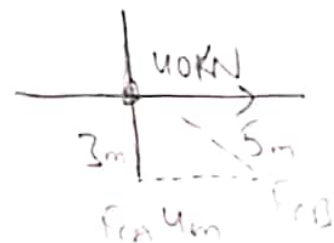
$$50 \left(\frac{3}{5} \right) - F_{CA} = 0.$$

$$F_{CA} = 30 \text{ kN} \quad (\text{Tension})$$

Now Joint (B)

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

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



Page (2).

$$\text{+ve } \uparrow \sum F_y = 0$$

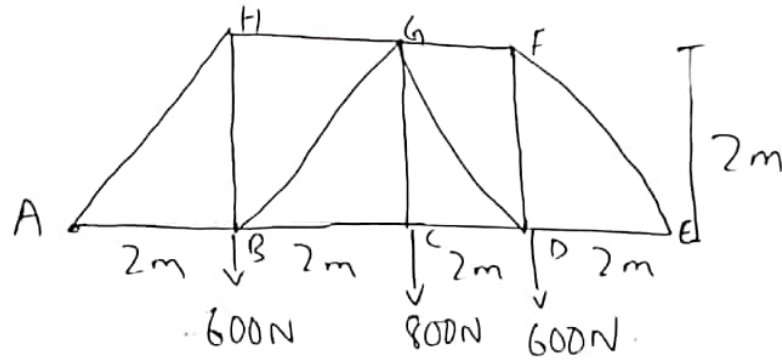
$$N_B - 50 \cdot \left(\frac{3}{5}\right) = 0$$

$$N_B = 300 \text{ kN.}$$



Q No (02)

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Solution \Rightarrow

~~Joint A~~ ~~A~~ \Rightarrow Now finding Reactions.

$$\sum M_n = 0 \quad \curvearrowleft \text{+ve} \quad \curvearrowright \text{-ve.}$$

$$0 = (2 \times 600) + (4 \times 800) + (6 \times 600) - R_E \times 8.$$

$$8R_E = 8000$$

$$R_E = \frac{8000}{8} = 1000 \text{ N}$$

As we know.

$$R_A + R_E = 2000 \text{ N.}$$

$$R_A + 1000 = 2000 \text{ N.}$$

$$R_A = 1000 \text{ N.}$$

Joint E:

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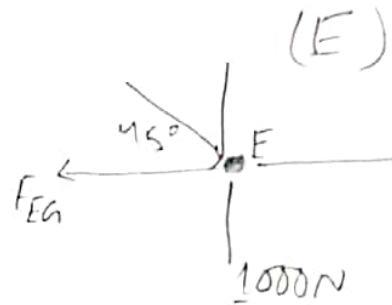
First we will start from Joint E.

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

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

$$0.707 F_{EF} = 1000$$

$$F_{EF} = 1414.42 \text{ N. (Compression)}$$



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

$$1414.42 \cos 45 - F_{ED} = 0.$$

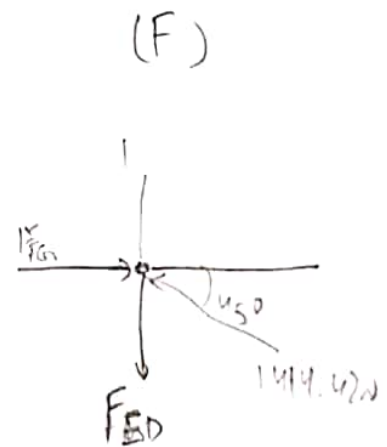
$$F_{ED} = 1000 \cdot 1.4 \text{ N. (Tension)}$$

Joint F:

$$\rightarrow \sum F_x = 0$$

$$F_{FG} - 1414.42 \cos 45 = 0.$$

$$F_{FG} = 1000 \cdot 1.4 \text{ N. (Compression)}$$



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

$$1444.42 \sin 45^\circ - F_{ED} = 0$$

$$F_{ED} = 1000 \cdot 14 \text{ N} \quad (\text{Tension})$$

Joint D \Rightarrow

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

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

$$F_{DG} = 565.77 \text{ N} \quad (\text{Compression})$$

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

$$1000 + 565.77 \cos 45^\circ - F_{DC} = 0.$$

$$1400 = F_{DC}$$

$$\Rightarrow F_{DC} = 1400 \text{ N}.$$

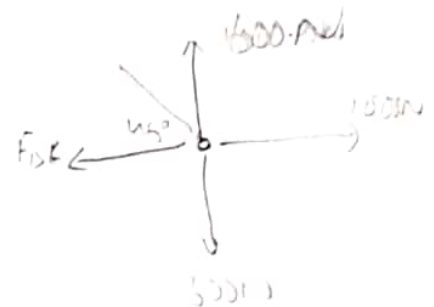
Joint C \Rightarrow

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

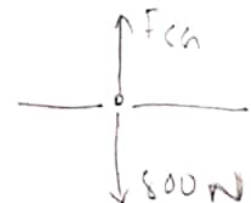
$$F_{CG} - 800 = 0 \quad \Rightarrow F_{CG} = 800 \text{ N} \quad (\text{Tension}).$$

~~CF~~

(D)



(C)



Due to Symmetry.

$$F_{BC} = F_{DC} = 1400 \text{ N (Tension)}$$

$$F_{HB} = F_{FD} = 1000 \cdot 14 \text{ N (Tension)}$$

$$F_{BG} = F_{DG} = 565.77 \text{ N (Tension)}$$

$$F_{HG} = F_{FG} = 1000 \cdot 14 \text{ N (Compression)}$$

$$F_{AH} = F_{EF} = 1414.42 \text{ N (Compression)}$$

$$F_{AB} = F_{ED} = 1000 \cdot 42 \text{ N (Tension)}$$

