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Section:- B

Subject:- structural analysis

Assignment:- 1

Date: _____

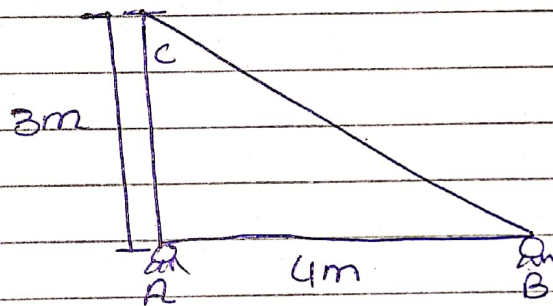
①

Q:-1:-

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

Solve

Given that



first of all we analysis
joint C

$$\rightarrow \sum F_x = 0$$

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

$$F_{CB} = 50.8 \text{ kN (C)}$$

DARSI NOTES

Date: _____

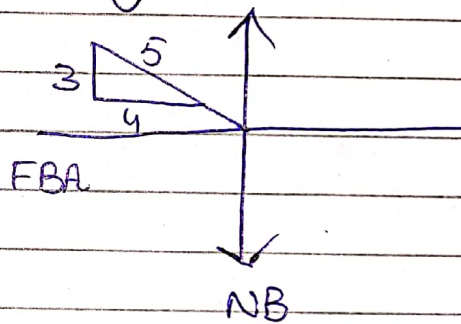
(2)

$$\uparrow \sum F_y = 0$$

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

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

Now we analysis joint CB



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

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

$$\uparrow \sum F_y = 0 \quad NB - 50.0 \left(\frac{3}{5} \right) = 0$$

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

DARSI NOTES

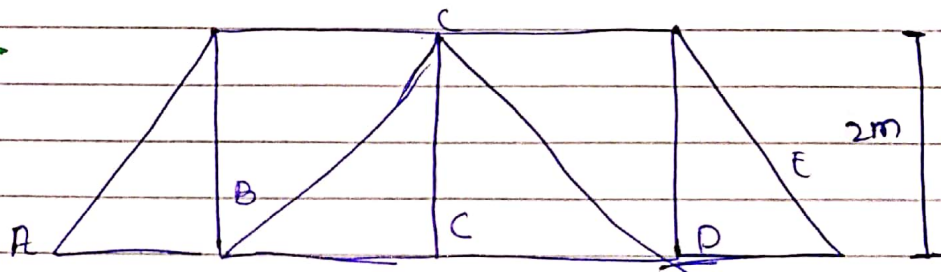
Q

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Q2:-

Solve:-

Given:-



Now we analysis joint (E)

$$\sum F_x = 0$$

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

$$F_{ED} = 100 \text{ N (T)} = 1 \text{ kN (T)}$$

Joint (f)

$$\sum F_x = 0$$

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

DARSI NOTES

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①

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

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

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

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

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

$$100 - 600 F_{GD} \sin 45^\circ = 0$$

$$F_{GD} = 565.75 \text{ N (C)} = 566 \text{ N (C)}$$

$$\rightarrow \sum F_x = 0$$

$$100 + 565.69 \cos 45^\circ - F_{DC} = 0$$

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

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Joint C

$$\uparrow \Sigma F_y = 0$$

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

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

Due to symmetry

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

$$F_{HB} = F_{ED} = 1.0 \text{ kN (I)}$$

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

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

$$F_{AH} = F_{EF} = 141 \text{ kN (C)}$$

$$F_{AB} = F_{ED} = 1.0 \text{ kN}$$