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SECTION B
DEPARTMENT BE(C)
SUBJECT STRUCTURAL ANALYSIS
SEMESTER 4th
DATE 13th July 2020

ASSIGNMENT

ANALYSIS OF STATICALLY DETERMINATE
TRUSSES

QUESTION No 1

Determine the force

it is in tension or compression?

To FIND :-

Force in each member of the truss

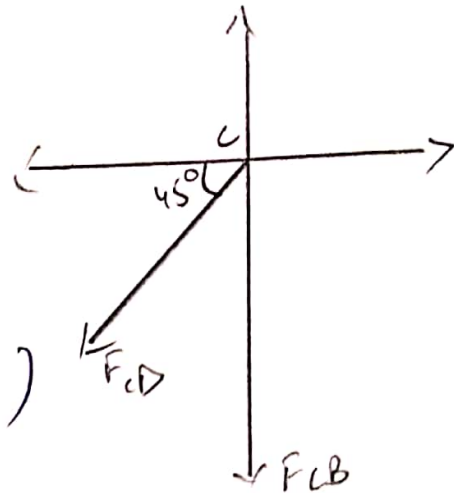
SOLUTION :-

POINT C :-

$$\sum F_x = 0 \quad \leftarrow \rightarrow +$$

$$10 - F_{CD} \cos 45^\circ = 0$$

$$F_{CD} = 14.14 \text{ kN (Tension)}$$



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

$$F_{CB} - 14.14 \sin 45^\circ = 0$$

$$F_{CB} = 10 \text{ kN (Compression)}$$

POINT D :-

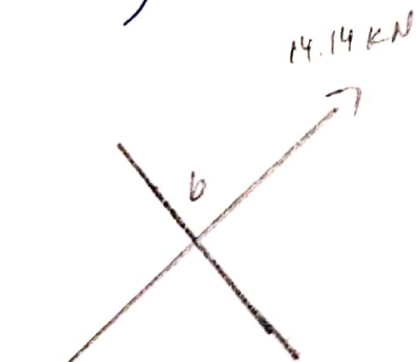
$$\sum F_x = 0 \quad \rightarrow +$$

$$14.14 - F_{DA} = 0$$

$$F_{DA} = 14.14 \text{ kN (Tension)}$$

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

$$F_{DB} = 0$$



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POINT B :-

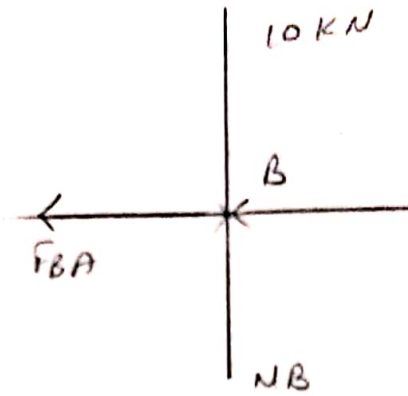
$$\sum F_x = 0$$

$$F_{BA} = 0$$

$$\sum F_y = 0$$

$$-10.0 + N_B = 0$$

$$N_B = 10.0 \text{ kN}$$



QUESTION No 02

Determine the force in each member
members are pin connected?

To FIND :-

Force in each member of the truss

SOLUTION :-

MOMENT

$$\sum M_A = 0$$

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

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

FORCES ON

POINT E IN

$$\sum F_y = 0$$

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

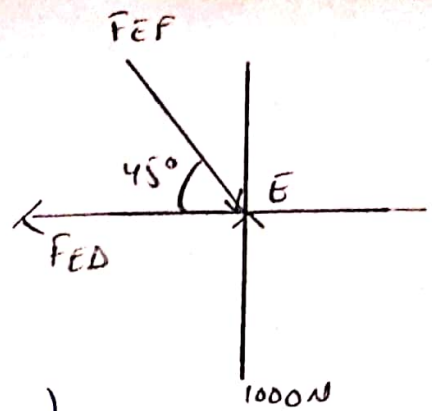
$$F_{EF} = 1414.21 \text{ N (Compression)}$$

$$\sum F_x = 0$$

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

$$F_{ED} = 1000 \text{ N}$$

$$F_{ED} = 1.00 \text{ kN (Tension)}$$



POINT F ON

$$\sum F_x = 0$$

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

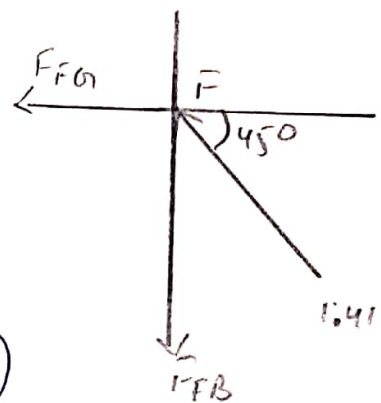
$$F_{FG} = 1000 \text{ N}$$

$$F_{FG} = 1.00 \text{ kN (Compression)}$$

$$\sum F_y = 0$$

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

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



POINT D ON

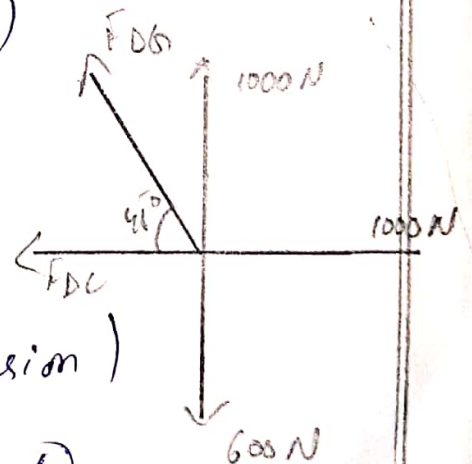
$$\sum F_y = 0$$

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

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

$$\sum F_x = 0$$
$$1000 + 565 \cos 45^\circ - F_{DC} = 0$$

$$F_{DC} = 1.40 \text{ kN (Tension)}$$

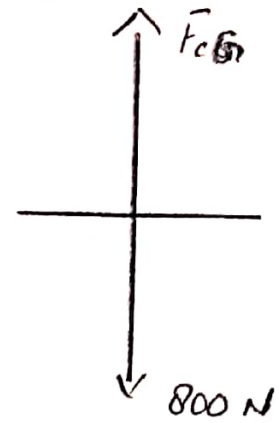


POINT C:

$$\sum F_y = 0$$

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

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



RESULT :

$$F_{DC} = F_{BC} = 1.40 \text{ KN (T)}$$

$$F_{FG} = F_{HD} = 1.00 \text{ KN (C)}$$

$$F_{FD} = F_{HB} = 1.00 \text{ KN (C)}$$

$$F_{ED} = F_{AB} = 1.00 \text{ KN (T)}$$

$$F_{DG} = F_{BG} = 866 \text{ N (C)}$$

$$F_{EF} = F_{AH} = 1.41 \text{ KN (C)}$$

