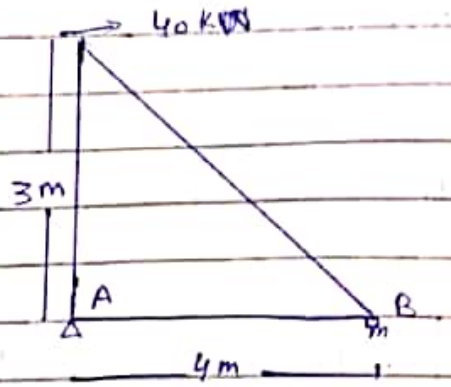
Question # 01

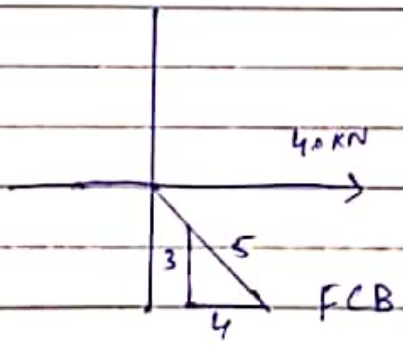
Determine the force in each member of the truss and state wether if is in tension or compression.

Sol:-

Given that



First of all we Analys Joint (C) So,



FCA

$\xrightarrow{+}$ $\Sigma F_x = 0$

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

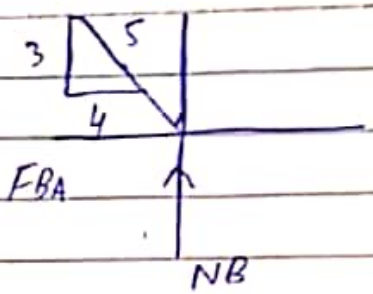
$$\boxed{F_{CB} = 50.0\,KN\,(S)}$$

$+\uparrow$ $\Sigma F_Y = 0$

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

$$\boxed{F_{CA} = 30.0\,KN\,(T)}$$

Now we Analysis Joint CB



$\xrightarrow{+}$ $\Sigma F_x = 0$ $\quad 50\left(\frac{4}{5}\right) - F_{BA} = 0$

$$\boxed{F_{BA} = 40.0\,KN\,(T)}$$

$+\uparrow$ $\Sigma F_Y = 0$ $\quad N_B - 50.0\left(\frac{3}{5}\right) = 0$

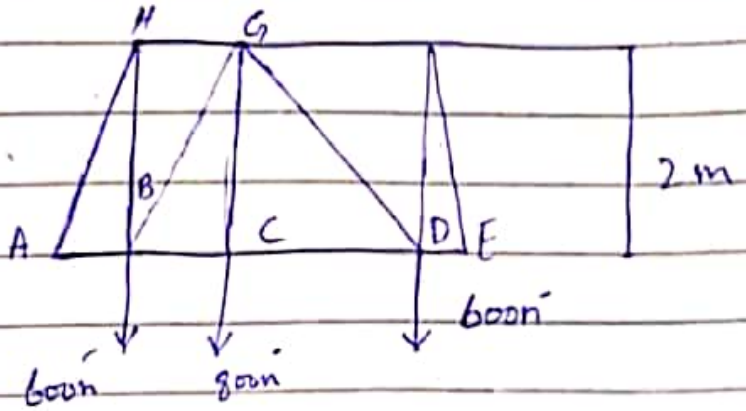
$$\boxed{N_B = 30.0\,KN}$$

Q #02:-

Determine The force in each member of the truss indicate if the member are in tension OR Compression Assume all member are pin Connected.

Solu:-

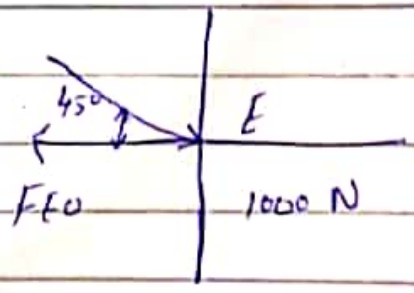
Given that:-



Now we Analyse Joint (E)

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

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



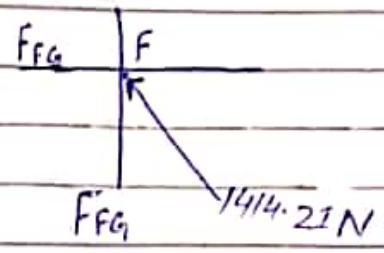
$$\boxed{F_{EF} = 1414.21\ N\ (C) = 1.41\ KN\ (C)}$$

$\xrightarrow{+}$ $\Sigma F_x = 0$

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

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

Joint (F)



$\xrightarrow{+}$ $\Sigma F_x = 0$

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

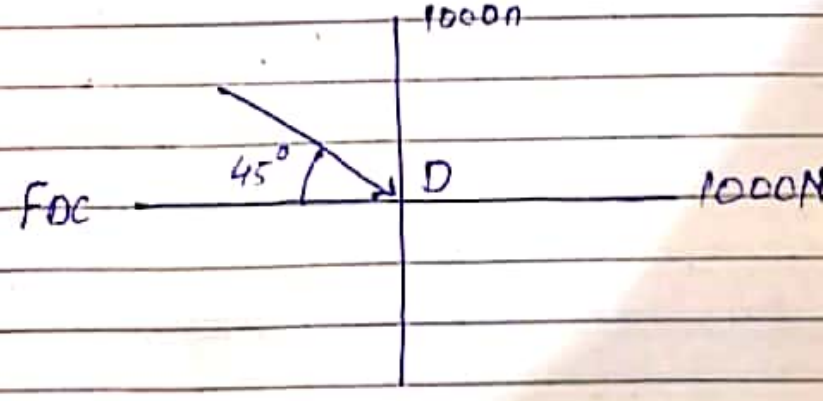
$F_{FG} = 1000\ N(C) = 1\ KN\ (C)$

$+\uparrow \Sigma F_y = 0;$

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

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

Joint (D)



$+\uparrow \Sigma F_y = 0$

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

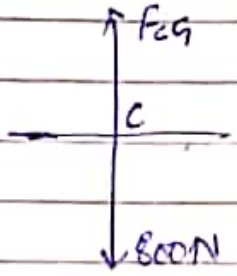
$F_{OG} = 565.69 \; N (C) = 566 \; N \; (C)$

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

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

$F_{OC} = 1400 \; N \; (T) = 1.4 \; KN \; (T)$

Joint (C)



$+\uparrow \Sigma F_y = 0$

$F_{CG} - 800 = 0$

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

Due to Symmetry

$F_{BC} = F_{OC} = 1.4 \; KN \; (T)$

$F_{HB} \cdot F_{FO} = 1.0 \; KN \; (T)$

(6)

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

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

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

$F_{AB} = F_{ED} = 1.0\ KN\ (T)$