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ID# 7911

Section: A

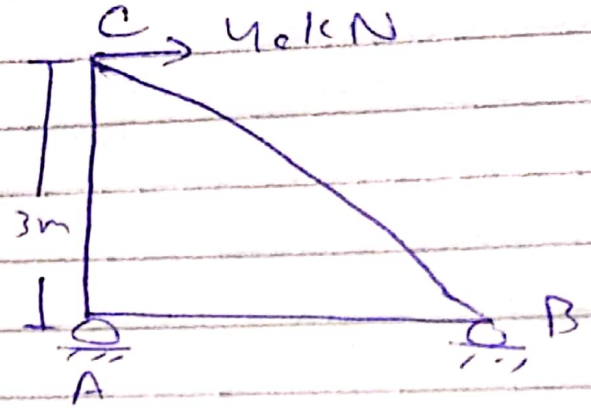
Assignment #: 02

Subject: Structure Analysis-I

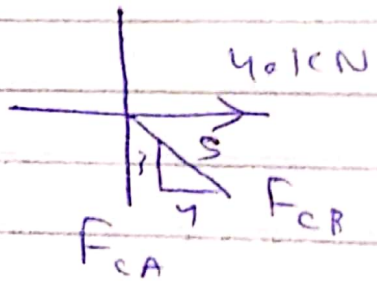
Assignment # 02

Question # 01

Solution:



Joint C :



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

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

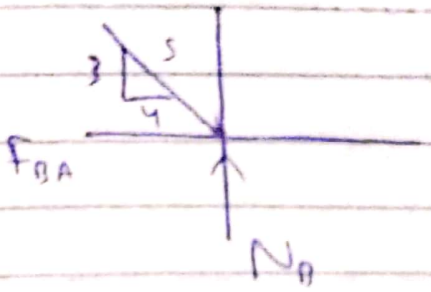
$$\boxed{F_{CB} = 50\ kN\ (C)}$$

$+\uparrow \Sigma F_y = 0$

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

$$\boxed{F_{CA} = 30\,kN\,(T)}$$

Joint B:



$$\stackrel{+}{\rightarrow} \Sigma F_x = 0$$

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

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

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

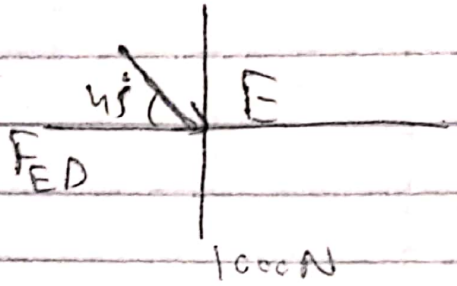
$$N_B - 50\left(\frac{3}{5}\right) = 0$$

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

Answer No 2

Solution:

Joint E:



$$+\uparrow \Sigma E_y = 0$$

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

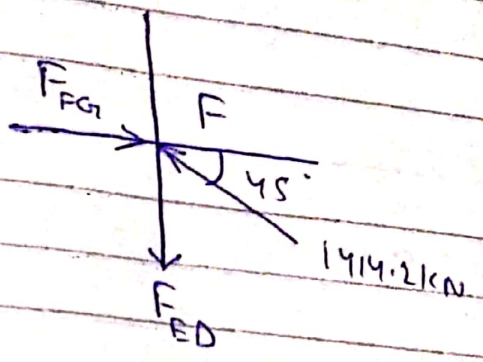
$$F_{EF} = 1414.21\,N(C) = 1.411\,kN(C)$$

$$\pm \rightarrow \Sigma F_x = 0$$

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

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

Joint F:



$$\rightarrow \Sigma F_x = 0$$

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

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

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

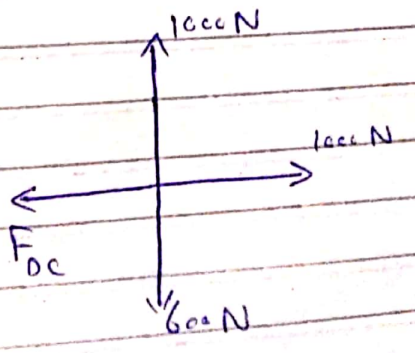
$$1414.21 \sin 45^\circ - F_{ED} = 0$$

$$F_{FD} = 1000\,N\,(T) = 1\,kN\,(T)$$

Joint D:

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

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



$$F_{DG} = 565.69\,N\,(C)$$

$$F_{DG} = 566\,N\,(C)$$

$+\rightarrow \Sigma F_x = 0$

$1000 + 565.59\cos 45° - F_{DC} = 0$

$F_{DC} = 1000 + 565.59\cos 45°$

$F_{DC} = 1400N\,(T)$

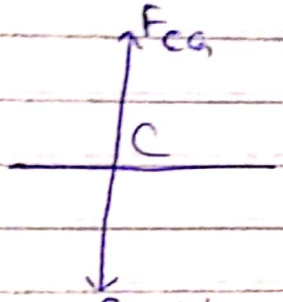
$\boxed{F_{DC} = 1.41kN\,(T)}$

Joint C:

$+\uparrow \Sigma F_y = 0$

$F_{CG} - 800 = 0$

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



Due to Symmetry

$F_{BC} = F_{DC} = 1.41kN\,(T)$

$F_{HB} = F_{FD} = 1.0kN\,(T)$

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

$F_{HG} = F_{GH} = 1.0kN\,(C)$

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

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