Assignment 2

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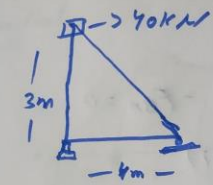
Section A

Subject structural Analysis.

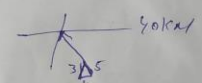
Q(1)



Solutions:

first of all analysis joint

So



$\pm \rightarrow \Sigma F_x = 0$

$40 - F_{CB}(4/5) = 0$

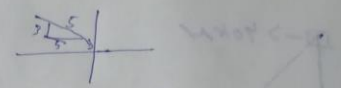
$F_{CB} = 50.0KN\ (C)$

$+\uparrow \Sigma F_y = 0$

$50(3/5) F_{CA} 20$

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

Now we analyse joints (B)



$\rightarrow \Sigma F_x = 0 \quad 50(3/5) - F_{BA} = 0$

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

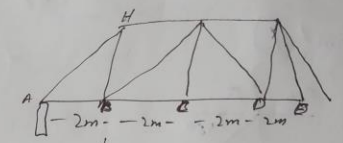
$+\uparrow \Sigma F_y = 0$

$N_B - 50.0(3/5) = 0$

$N_B = 30.0 kN$

Q#2

Given that



600kN 600kN 600kN.

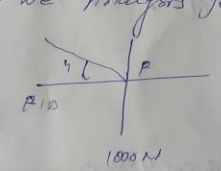
Solution.

$$\zeta + \Sigma M_A = 0$$

$$\Sigma y(8) - 600(2) - 800(4) - 600(6) = 0$$

$$\Sigma y = 1000\,N$$

Now we Analysis Joint (E)



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

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

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

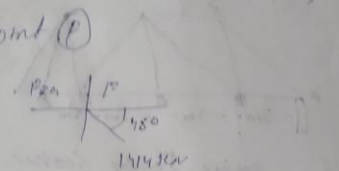
$$\Rightarrow 1.414\,kN\,(C)$$

$\Sigma F_y = 0$

$1414.21 \cos 45° - F_{BD} = 0$

$F_{BD} = 1000 N$ (C) $= 1 kN$ (C)

Joint (B)



$\Sigma F_x = 0$;

$F_{BA} - 1414.21 \cos 45° = 0$

$F_{BA} = 1000N$ (C) $= 1kN$ (C)

$+\circlearrowleft \Sigma F_G = 0$;

$1414.21 \sin 45° - F_{CD} = 0$

$F_{CD} = 1000N$ (T) $= 1kN$ (T)

Joint D

$+\uparrow \Sigma F_y = 0$

$1000 - 600 - F_{DG} \sin 45° = 0$

$F_{DG} = 565.69N$ (C) $= 566N$ (C)

$\Sigma F_x = 0$

$1000 + 565.67 \cos 45° - F_{DC} = 0$

$F_{DC} = 1400 N (C) = 1.4 KN (T)$

Joint (C)

$+ \uparrow \Sigma F_y$

$F_{BG} - 800 = 0$

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

Due to symmetry.

$F_{BC} = F_{DC} = 1.41 KN (T)$

$F_{HB} = F_{FD} = 1.0 KN (T)$

$F_{BG} = F_{DG} = 566 KN (C)$

$F_{HG} = F_{FG} = 1.0 KN (T)$

$F_{AH} = F_{EF} = 1.41 KN (T)$

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