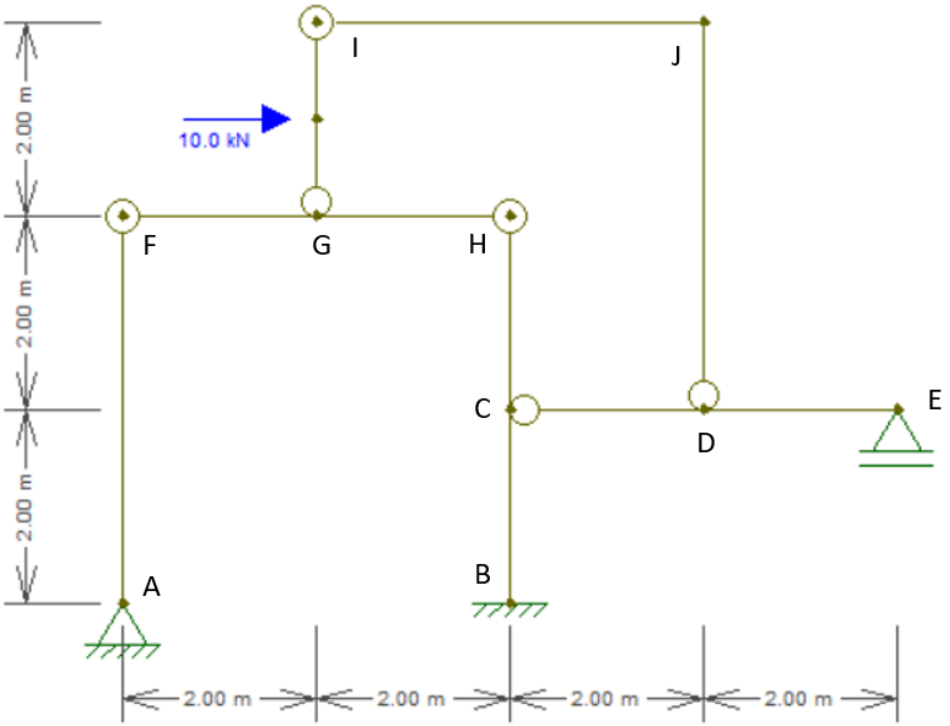
PEF-3200 – Terceira Prova – 13/07/2022

Nº

USP:_____Nome:_____Gabarito_____

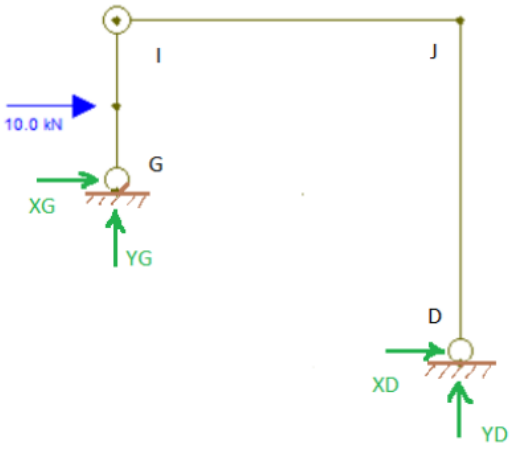
3ª Questão (3,5 ptos): Para a estrutura associada da figura, onde o único carregamento é uma carga concentrada de 10 kN no meio da barra GI:

a) Decomponha-a nas subestruturas que a formam;
b) Calcule as reações em B;
c) Desenhe os diagramas de esforços solicitantes do trecho BCH.



Resolução:

a), b)

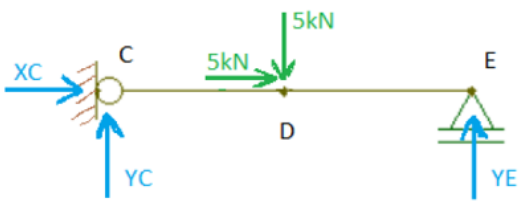


$M_I = 0$ $XG*2 + 10*1 = 0$ **XG = -5kN**

$\Sigma X = 0$ $10 + XG + XD = 0$ **XD = -5kN**

$\Sigma M_G = 0$ $-10*1 + YD*4 + XD*2 = 0$ **YD = 5kN**

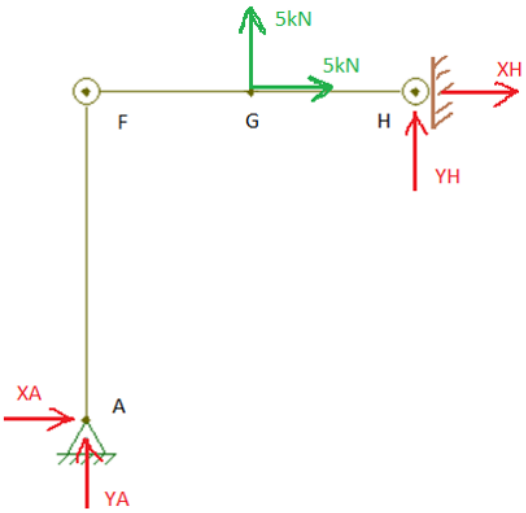
$\Sigma Y = 0$ $YG + YD = 0$ **YG = -5kN**



$\Sigma X = 0$ $5 + XC = 0$ **XC = -5kN**

$\Sigma M_C = 0$ $-5*2 + YE*4 = 0$ **YE = 2,5kN**

$\Sigma Y = 0$ $YC + YE = 0$ **YC = 2,5kN**

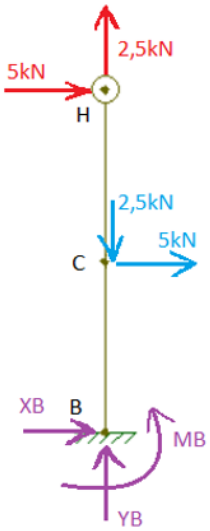


$M_{F,e} = 0$ $XA*4 = 0$ **XA = 0**

$M_{F,d} = 0$ $5*2 + YH*4 = 0$ **YH = -2,5kN**

$\Sigma X = 0$ $5 + XA + XH = 0$ **XH = -5kN**

$\Sigma Y = 0$ $5 + YA + YH = 0$ **YA = -2,5kN**



$\Sigma X = 0$ $5 + 5 + XB = 0$ **XB = -10kN**

$\Sigma Y = 0$ $2,5 - 2,5 + YB = 0$ **YB = 0**

$\Sigma M_B = 0$ $-5*4 -5*2 + MB = 0$ **MB = 30kNm**

c)