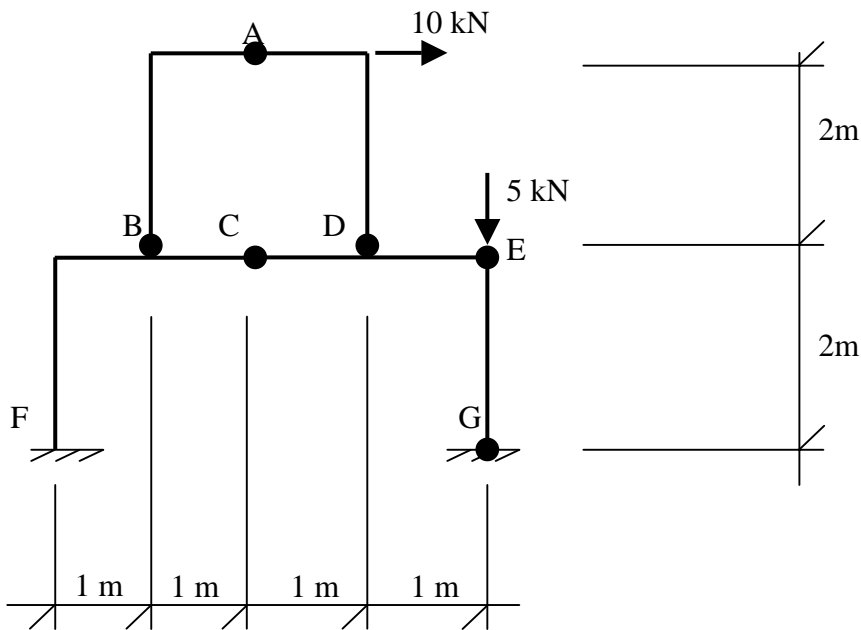


Nº USP: \_\_\_\_\_ Nome: \_\_\_\_\_

**Questão 3 (4,0)**

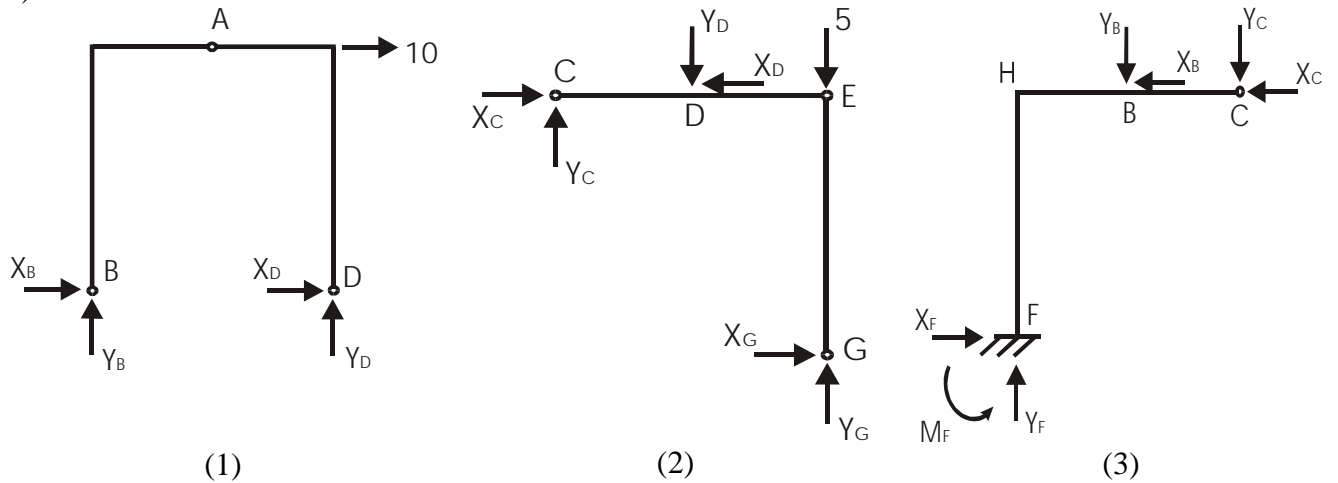
Para a estrutura associada da figura, determine:

- a) as subestruturas que a compõem;
- b) as reações em G;
- c) o diagrama do momento fletor no trecho FHCEG.



Solução:

a)



b)

Em (1):

$$b.1) \sum M_B = 0 = -10 \cdot 2 + Y_D \cdot 2 \Rightarrow Y_D = 10 \text{ kN}$$

$$b.2) \sum Y = 0 = Y_B + Y_D \Rightarrow Y_B = -10 \text{ kN}$$

$$b.3) M_{A^+} = 0 = Y_D \cdot 1 + X_D \cdot 2 \Rightarrow X_D = -5 \text{ kN}$$

$$b.4) \sum X = 0 = X_B + 10 + X_D \Rightarrow X_B = -5 \text{ kN}$$

Em (2):

$$b.5) M_{C^+} = 0 = X_G \cdot 2 \Rightarrow X_G = 0$$

$$b.6) \sum X = 0 = X_C + 5 + X_G \Rightarrow X_C = -5 \text{ kN}$$

$$b.7) \sum M_C = 0 = -10 \cdot 1 - 5 \cdot 2 + X_G \cdot 2 + Y_G \cdot 2 \Rightarrow Y_G = 10 \text{ kN}$$

$$b.8) \sum Y = 0 = Y_C - Y_D - 5 + Y_G \Rightarrow Y_C = 5 \text{ kN}$$

Em (3):

$$b.9) \sum X = 0 = X_F - X_B - X_C \Rightarrow X_F = -10 \text{ kN}$$

$$b.10) \sum Y = 0 = Y_F - Y_B - Y_C \Rightarrow Y_F = -5 \text{ kN}$$

$$b.11) \sum M_F = 0 = M_F - Y_B \cdot 1 + X_B \cdot 2 - Y_C \cdot 2 + X_C \cdot 2 \Rightarrow M_F = 20 \text{ kN} \cdot \text{m}$$

c)

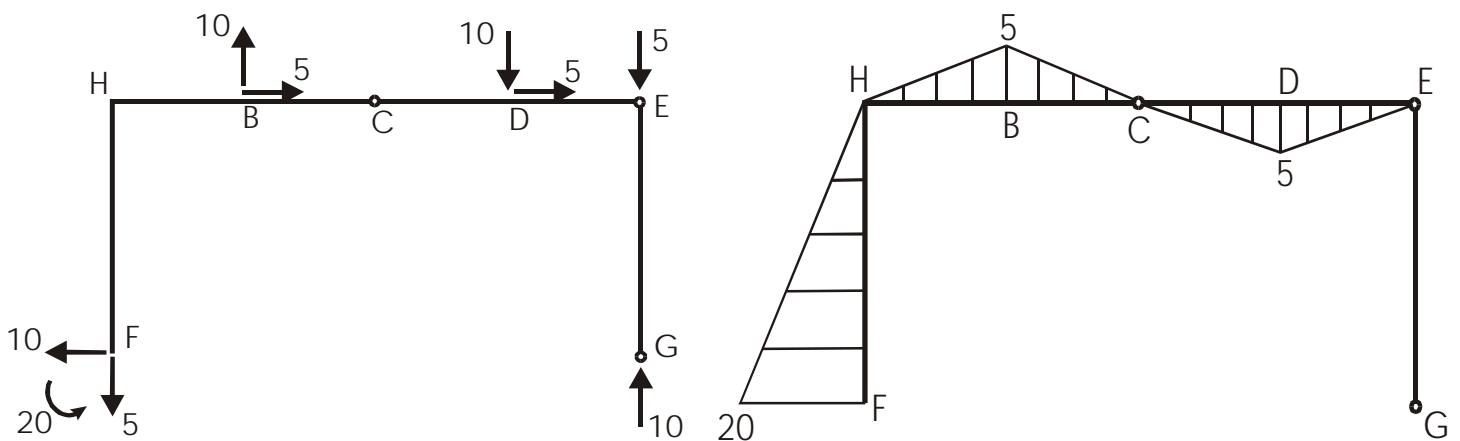


Diagrama de momentos fletores em FHCEG