Remarks: See §2.2.1, pages 19 till 21
See §2.3, pages 24 till 26
See §2.6, pages 34 onwards

Answers:

a. $N^{(BD)} = +40$ kN
$N^{(CD)} = -80$ kN
b. $F = 150$ kN
c. $u_{D;vert} = 1{,}8$ mm $(\uparrow)$

Explanation:

a. $N^{(BD)} = \dfrac{(+1{,}6 \text{ mm})(125\times10^6 \text{ N})}{5000 \text{ mm}} = +40$ kN

$N^{(CD)} = \dfrac{(-1{,}6 \text{ mm})(125\times10^6 \text{ N})}{2500 \text{ mm}} = -80$ kN

b. Horizontal equilibrium at joint D:

$\sum F_h(\rightarrow) = \frac{4}{5}F - N^{(BD)} + N^{(CD)} = 0$ it follows that:

$F = \frac{5}{4}\times(N^{(BD)} - N^{(CD)}) = 150$ kN

c. $N^{(AD)} = \frac{3}{5}\times(150 \text{ kN}) = +90$ kN

$u_{D;vert}(\uparrow) = \Delta\ell^{(AD)} = \dfrac{(90 \text{ kN})(2500 \text{ mm})}{125\times10^3 \text{ kN}} = 1{,}8$ mm