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

Answers:

a. $\varepsilon^{(1)} = 0{,}1$ ‰ $\quad \sigma^{(1)} = 20$ N/mm^2
$\varepsilon^{(2)} = 0{,}2$ ‰ $\quad \sigma^{(2)} = 20$ N/mm^2
$\varepsilon^{(3)} = 0{,}3$ ‰ $\quad \sigma^{(3)} = 90$ N/mm^2

b. $N^{(1)} = +20$ kN
$N^{(2)} = +20$ kN
$N^{(3)} = +90$ kN

c. $F = 110$ kN

d. $A_v = 20$ kN ($\downarrow$)

Explanation:

a. Rigid beam:
$\Delta\ell^{(1)} = \frac{2}{6} \times (0{,}6 \text{ mm}) = 0{,}2 \text{ mm}$
$\Delta\ell^{(2)} = \frac{4}{6} \times (0{,}6 \text{ mm}) = 0{,}4 \text{ mm}$
$\varepsilon^{(1)} = \dfrac{0{,}2 \text{ mm}}{2000 \text{ mm}} = 0{,}1 \times 10^{-3}$; etc..

b. $N^{(1)} = 0{,}1 \times 10^{-3} \times (200 \times 10^3 \text{ kN}) = +20$ kN
$N^{(2)} = 0{,}2 \times 10^{-3} \times (100 \times 10^3 \text{ kN}) = +20$ kN
$N^{(3)} = 0{,}3 \times 10^{-3} \times (300 \times 10^3 \text{ kN}) = +90$ kN

c. $\sum T_z \,|\mathrm{A} = 0 \;\Rightarrow\; F = 110$ kN

d. $\sum F_{\text{vert}} = 0 \;\Rightarrow\; A_v = 20$ kN ($\downarrow$)