Remarks: See §5.4.2 example 1, pages 322 till 335

Answer:

c. $\tau_{max} = 3 \text{ N/mm}^2$

Explanation:

a. $I_{yy} = 2(I_{flange;centr} + I_{flange;steiner}) + I_{web;steiner} = 18\times10^6 \text{ mm}^4$
$I_{web;centr} \approx 0$ and is negligible.

c. The shear stress distribution in the flanges is parabolic. Maximum shear stress is at $y = 0$ and above the normal centre NC:

$$\tau_{max;flens} = \left|\frac{V_y S_y^a}{b^a I_{yy}}\right| = \frac{(7200 \text{ N})(80\times10^3 \text{ mm}^3)}{(16 \text{ mm})(18\times10^6)} = 2 \text{ N/mm}^2$$

The shear stress in the web varies linearly, and is maximum at the junction

$$\tau_{max;web} = \left|\frac{V_y S_y^a}{b^a I_{yy}}\right| = \frac{(7200 \text{ N})(60\times10^3 \text{ mm}^3)}{(8 \text{ mm})(18\times10^6)} = 3 \text{ N/mm}^2$$