1. (20 points) Knowing that for the extruded beam shown in Figure 1 the allowable stress is 120 MPa in tension and 150 MPa in compression, determine the largest couple $M$ which may be applied.

2. (20 points) For the beam shown in Figure 2, a couple of moment equal to the plastic moment $M_p$ of the beam is applied and then removed. Using a yield strength of 300 MPa, determine the residual stress at (a) $y = 24$ mm, (b) $y = 44$ mm. ($E = 200$ GPa)

3. (20 points) Determine (a) the location of the shear center $O$ of a thin-walled beam of uniform thickness having the cross section shown in Figure 3 and (b) the distribution of the shearing stresses.

4. (20 points) Knowing that the clamp shown in Figure 4 has been tightened until $P = 400$ N, determine (a) the stress at point A, (b) the stress at point B, (c) the location of the neutral axis of section a-a.

5. (20 points) For the beam and loading shown in Figure 5, determine (a) the equation of the elastic curve, (b) the deflection at the free end by using the singularity functions.

6. (20 points) For the beam and loading shown in Figure 6, consider section n-n and determine (a) the largest normal stress, (b) the shearing stress at point a, (c) the largest shearing stress.

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