

Palestine Technical University Kadouri

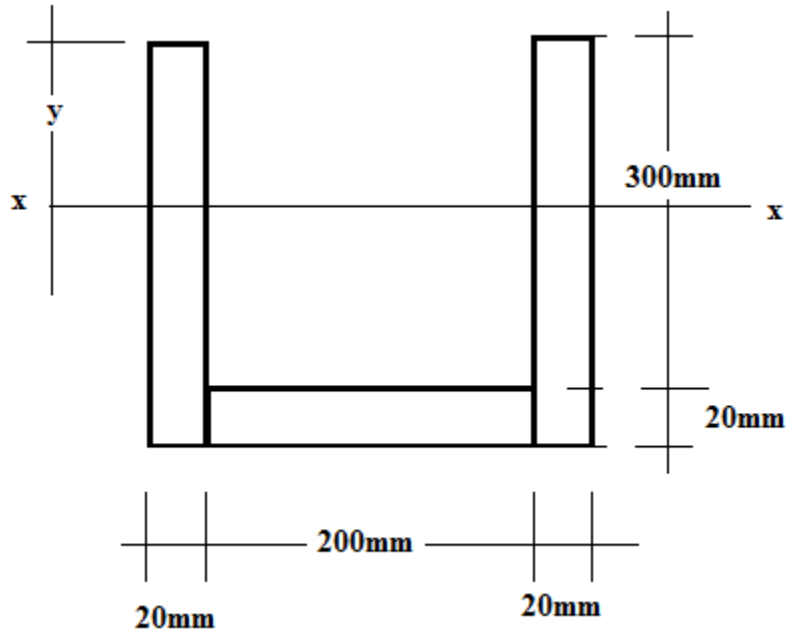
Faculty of Engineering

Second Exam: Mechanics of Materials

Question # 1:

If the section shown is subjected to Bending moment of 30kN.m, causing compression on the top fiber, determine:

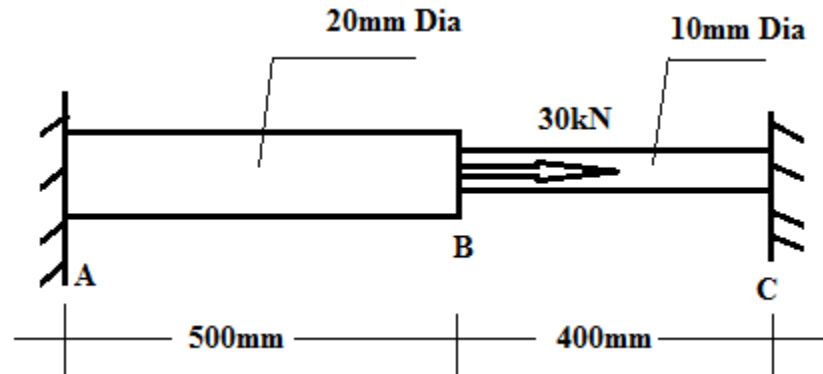
1. The depth of centroid y ?
2. The moment of inertia?
3. The maximum bending stress in tension and compression?



Question #2:

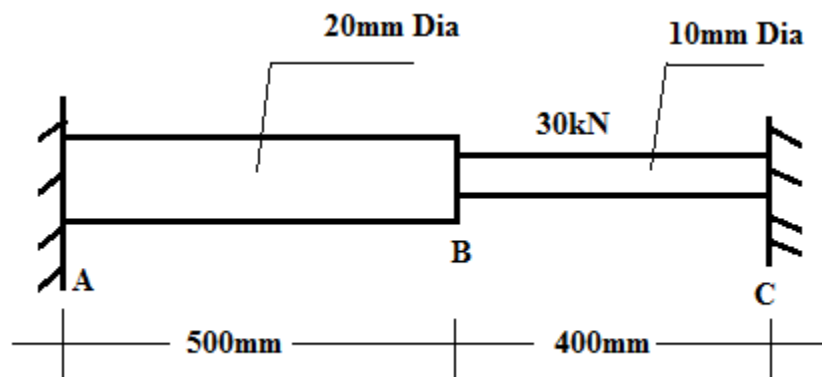
a) For the axially loaded bar shown, determine:

1. The normal stress in segment AB?
2. The normal deformation of BC?



b) If the bar shown is subjected to an increase change in temperature of 15°C, determine:

1. The normal stress in BC?
2. The normal deformation of AB?



Given: the thermal expansion coefficient is $(12 \times 10^{-6})/^\circ\text{C}$

Question # 3:

For the solid shaft subjected to the torque system shown, determine:

1. The maximum shear stress in the shaft?
2. The angle of twist of D with respect to B?

