1. See Fig. 1. Given: $L = 1.6$ m, $d = 1.2$ m, $c = 0.5$ m, both of the bar wire has the same cross-sectional area, $A = 16$ mm^2, modulus of elasticity, $E = 200$ GPa, and $h = 0.4$ m. Assume beam AB is rigid and $P = 970$ N. Find tensile stress in wires C, σ_c, and D, σ_D, as well as the downward displacement at B, δ_B. (25 pt)

2. See Fig. 2. Determine the allowable force P if the maximum permissible shear stress in the shaft is 45 MPa. Given: shaft outer diameter, $d_1 = 50$ mm, inner diameter, $d_2 = 40$ mm. (25 pt)

3. See Fig. 3a and 3b. Find maximum tensile and compressive stresses in the beam. (25 pt)

4. See Fig. 4. Given: $\sigma_x = 67$ kPa. The stress along the diagonal t-t section is $\sigma_t = -6.57$ kPa (Compression). Solve for σ_y at element A. Hint: Use Mohr's circle. (25 pt)
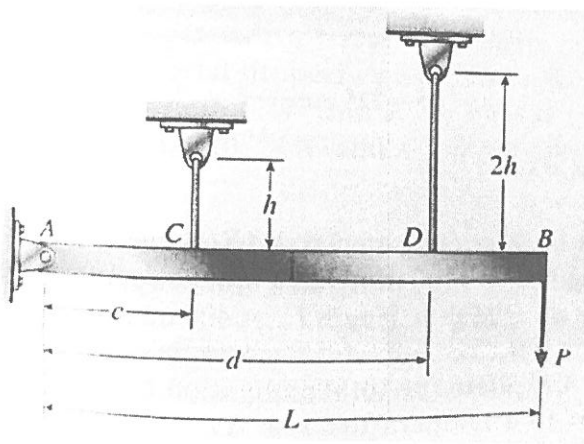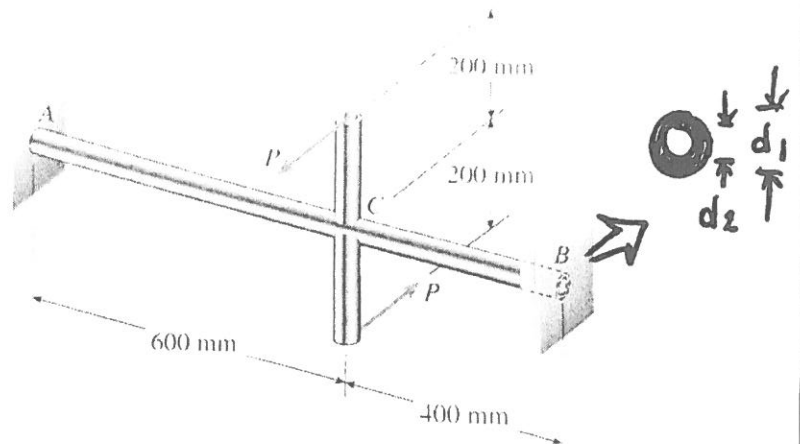
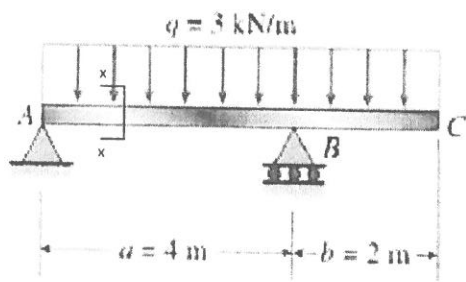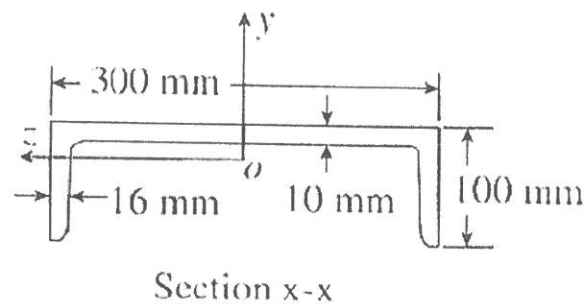Fig. 1   Fig. 2

Fig. 3a   Fig. 3b

Section x-x

Fig. 4