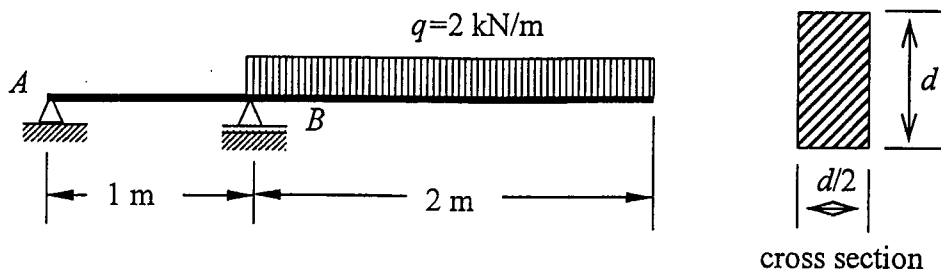
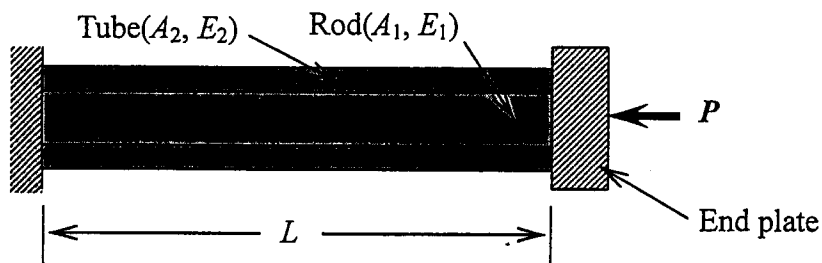


1. For the beam and loading shown, design the cross section of the beam, knowing that the allowable stresses $\sigma_{all} = 15\text{MPa}$ and $\tau_{all} = 10\text{MPa}$. (20%)



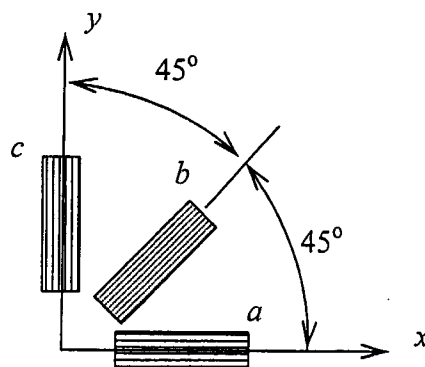
2. A rod of length L , cross-sectional area A_1 , and modulus of elasticity E_1 , has been placed inside a tube of the same length L but of cross-sectional area A_2 and modulus of elasticity E_2 . Determine the stress in the rod and the tube when a force P is exerted on a rigid end plate as shown? (20%)



3. The strains determined by use of the rosette shown are

$$\epsilon_a = 500 \times 10^{-6} \quad \epsilon_b = -120 \times 10^{-6} \quad \epsilon_c = 100 \times 10^{-6}$$

Determine (a) the shearing strain γ_{xy} , (b) the in-plane principal strains, (c) the in-plane maximum shearing strain. (20%)



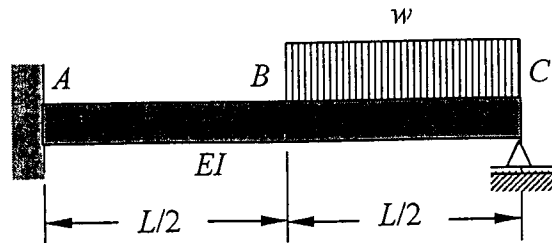
(背面仍有題目, 請繼續作答)

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系所：土木工程學系丙組，丁組

科目：材料力學

4. For the uniform beam ABC , determine (a) the reaction at C , (b) the deflection at B . (20%)



5. A beam has the cross section shown. For a vertical shear of 100 kN, determine the shearing stress at (a) point a , (b) point b . (20%)

