

淡江大學 99 學年度碩士班招生考試試題

67-1

系別：航空太空工程學系

科目：材 料 力 學

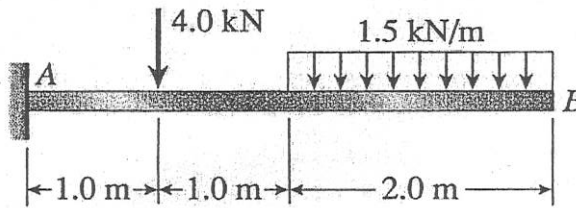
准帶項目請打「V」	
✓	計算機

本試題共 2 頁，4 大題

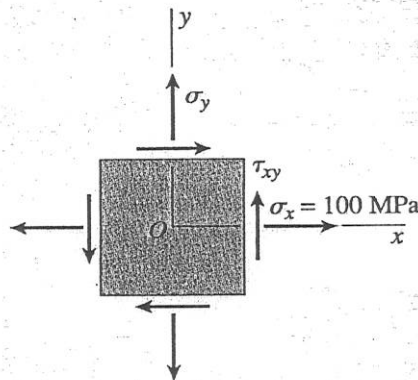
本試題雙面印製

1. (30%) A copper rod with 10mm diameter is under tension test. The original guage length is 50 mm. and increase 0.122mm after 20 kN tensional force. 122 mm. Calculate (a) the modulus of elasticity E (GPa), (b) the Poisson's ratio, if the diameter contraction (Δd) is 0.0083 mm, (c) the shear modulus of elasticity G (GPa).

2. (30%) Calculate the (a) shear force V and (b) bending moment M at a cross section located 0.5m from the fixed support of the cantilever beam AB shown in the following figure.



3. (20%) The surface of an airplane wing is subjected to plane stress with normal stress σ_x and σ_y and shear stress τ_{xy} , as shown in the following figure. At a counterclockwise angle $\theta = 30^\circ$ from the x axis the normal stress is 35 MPa tension, and at an angle $\theta = 50^\circ$ it is 10 MPa compression. If the stress σ_x equals 100 MPa tension, what are the stresses (a) σ_y and (b) τ_{xy} ?



◀ 注意背面尚有試題 ▶

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4. (20%) A simple beam AB is subjected to a distributed load of intensity $q = q_0 \sin \frac{\pi x}{L}$, where q_0 is the maximum intensity of the load. (a) Derive the equation of the deflection curve, and then (b) determine the deflection δ_{\max} at the midpoint of the beam. Use the fourth-order differential equation of the deflection curve (the load equation).

