淡江大學九十三學年度碩士班招生考試試題

系別：機械與機電工程學系　　科目：材 料 力 學

准帶項目請打「○」否則打「×」
○ 簡單型計算機

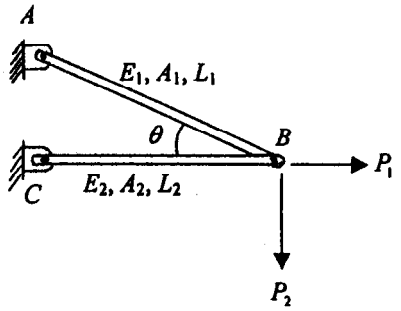
本試題共 2 頁

本試題雙面印製

1.(25%) A truss structure has two axial force members. The moduli of elasticity for the first and the second members are E_1=200GPa, and E_2=70GPa. The cross-section areas of two members are $A_1=4\times10^{-4}m^2$, and $A_2=8\times10^{-4}m^2$. The second member has a length L_2=0.6m. It is known that θ=30°, P_1=100kN, and P_2=500kN. Determine:

a) axial forces F_1 and F_2 on the two members.

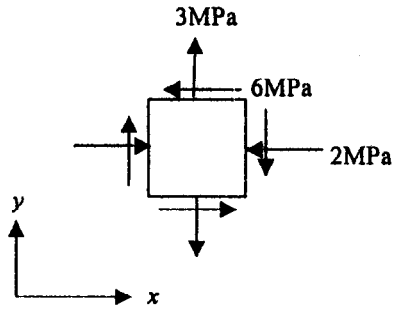
b) horizon and vertical displacements of the joint B.



2. (25%) An element in *plane stress* is subjected to the stresses shown in the figure. Determine

a) principal stresses and directions of principal planes.

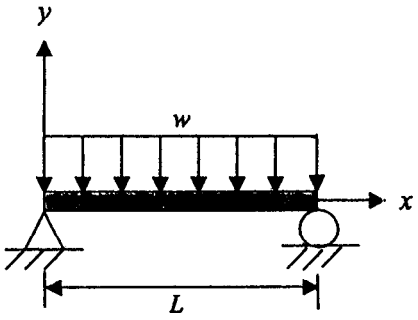
b) maximum shear stresses and directions of the planes on which they act.

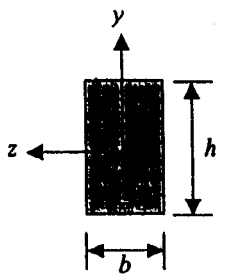


3. (25%) A simply supported beam is subjected to a uniform distributed loading w. This beam has a rectangular cross section whose width and depth are b and h respectively. Determine:

a) the maximum bending stress in the beam.

b) the maximum shear stress in the beam.





◀注意背面尚有試題▶

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4. (25%) A continuous beam carries a uniform load w. This beam has a uniform cross-section and has a moment of inertia I. Modulus of elasticity is E.
   a) What is (are) the differential equation(s) for the deflection curve $v(x)$?
   b) What are boundary conditions for the differential equation(s)?