

# 淡江大學 98 學年度碩士班招生考試試題

70  
-

系別：航空太空工程學系

科目：材 料 力 學

准帶項目請打「V」	
✓	簡單型計算機

本試題共 2 頁，4 大題

1. A stepped shaft is subjected to three torques as shown in Figure 1. The length of each section is 0.5 m and the diameters are 80 mm, 60 mm, and 40 mm. The material is steel with shear modulus of elasticity  $G = 80 \text{ GPa}$ . Please calculate
- The maximum shear stress  $\tau_{\max}$  in the shaft. (15%)
  - The angle of twist  $\phi$  at the free end. (10%)

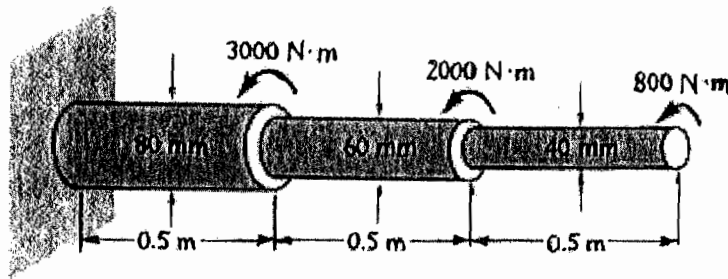


Figure 1

2. The state of stress at a point on the upper surface of the wing is shown on the element in Figure 2. Please determine
- The principal stresses and orientation. (15%)
  - The maximum in-plane shear stresses and associated normal stresses. (10%)
- Show all results on sketches of properly oriented elements.

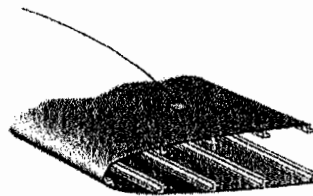
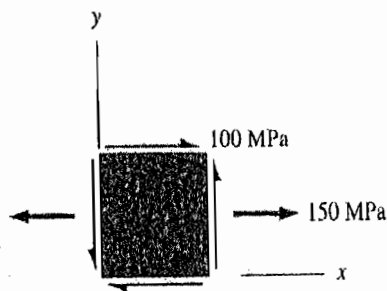


Figure 2

本試題雙面印製

# 淡江大學 98 學年度碩士班招生考試試題

20-2

系別：航空太空工程學系

科目：材 料 力 學

准帶項目請打「V」	
✓	簡單型計算機

本試題共 2 頁，4 大題

3. For a 9 meter long hollow circular cross-section flagpole fixed at the base and subjected to an end load of 2000 N shown as in Figure 3. The inner diameter is 125 mm and the outer diameter is 135 mm. Please determine
- The maximum bending stress. (15%)
  - The maximum shear stress. (10%)

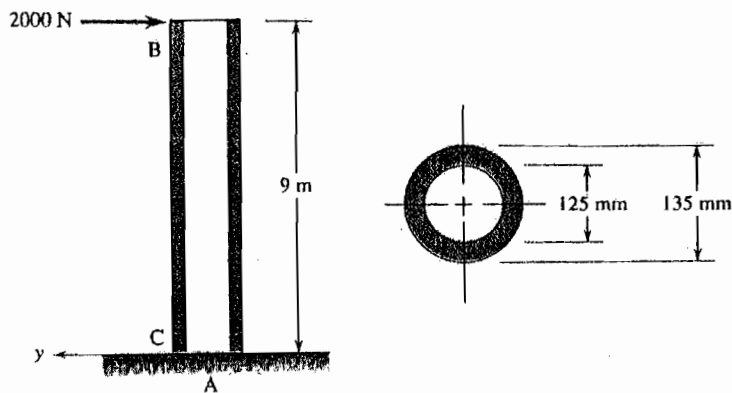


Figure 3

4. An overhang beam  $ABC$  is subjected an concentrated load at point  $C$  shown as in Figure 4, Please determine the vertical deflection at point  $C$ , assume  $EI = \text{constant}$ . (25%)

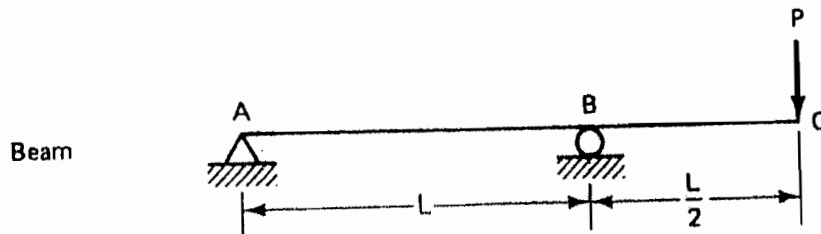


Figure 4