

淡江大學九十一學年度碩士班招生考試試題

系別：土木工程學系

科目：材料力學

准帶項目請打「○」否則打「×」	
計算機	字典
○	×

本試題共 / 頁

1. The horizontal rigid beam ABCD is supported by vertical bars BE and CF and is loaded by vertical forces $P_1 = 100$ k and $P_2 = 110$ k. Bars BE and CF are made of steel ($E = 29 \times 10^6$ psi) and have cross-sectional areas $A_{BE} = 18$ in² and $A_{CF} = 19.2$ in². Determine the vertical displacements at points A, B, C, and D. 20% (Fig. 1)

2. A cantilever beam AB loaded by a uniform load and a concentrated load is constructed of a channel section. Find the maximum tensile stress and maximum compressive stress. (Neglect the weight of the beam) 20% (Fig. 2)

3. A sign is supported by a pipe having outer diameter 100 mm and inner diameter 75 mm. The wind pressure against the sign is 2.0 kPa. Determine the maximum in-plane shear stress due to the wind pressure on the sign at points A, B, and C, located on the outer surface at the base of the pipe. 25% (Fig. 3)

4. Find the angle of rotation θ_B and deflection δ_B at the free end B of a cantilever beam ACB supporting a uniform load of intensity q acting over the right-hand half of the beam. (Use moment-area method) 20% (Fig. 4)

5. Explanations: 15%

- (a) Flexural rigidity
- (b) Statically indeterminate structure
- (c) Brittle material

