淡江大學 100 學年度碩士班招生考試試題

63-1

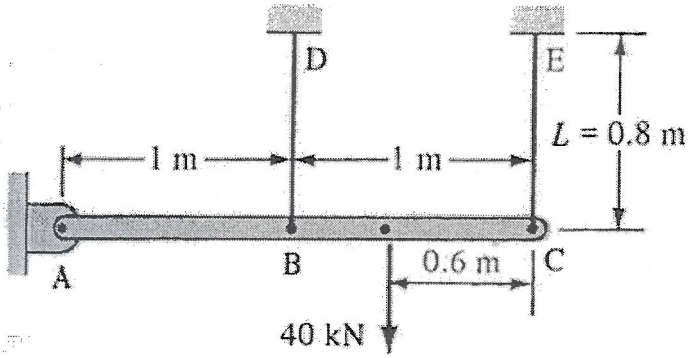
系別：航空太空工程學系　　科目：材 料 力 學

考試日期：2 月 28 日(星期一) 第 2 節　　本試題共 4 大題， 2 頁

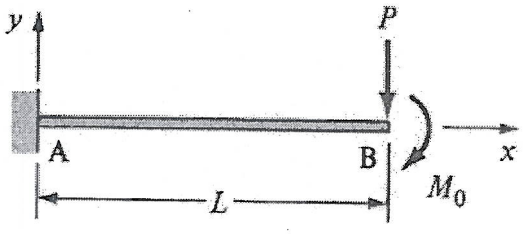
Page 1

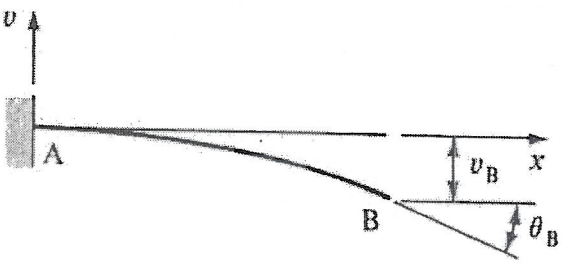
本試題雙面印刷

1. A rigid horizontal bar is supported by a hinge at A and by two steel cables BD and CE, which are of equal length, L= 0.8 m, and cross-sectional area, A = 140 mm^2. Please calculate (a) The elongations of cables BD and CE. (b) The stress in each cable. Assume E = 200 GPa. (25%)



2. A force P and a moment M_0 are applied at the free end of a cantilever beam of uniform cross section. Determine the deflection and slope at B. Assume P=20kN, M_0 = 5 kN-m, L = 2 m, and EI = 10 MN-m^2. (25%)





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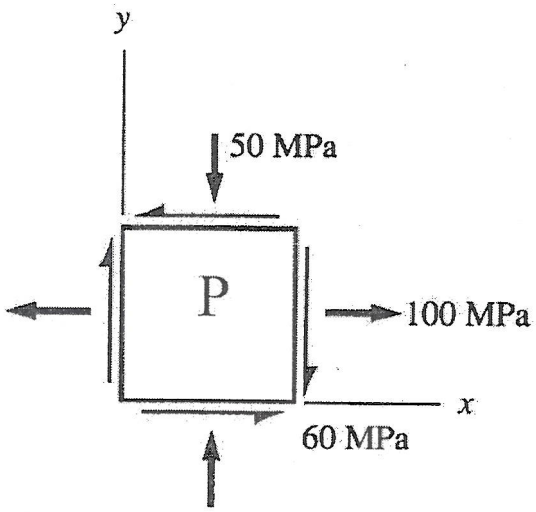
63-2

3. The state of plane stress at a point P on the element. Please determine

(a) The principal stresses and orientation.

(b) The maximum in-plane shear stresses and associated normal stresses.

Show all results on sketches of properly oriented elements. (25%)



4. The T-shaped cross section cantilever beam is acted upon in its plane of symmetry by a force 6 kN shown as below. Please determine the maximum normal stress σ_{max} in the beam. (25%)