

國立成功大學

112學年度碩士班招生考試試題

編 號： 132

系 所： 航空太空工程學系

科 目： 材料力學

日 期： 0206

節 次： 第 1 節

備 註： 不可使用計算機

※ 考生請注意：本試題不可使用計算機。 請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. (25%) A prismatic bar  $AB$ , with axial rigidity  $EA$ , is fixed at both ends and is loaded by a uniformly distributed axial load  $p$  from the mid-span  $C$  to end  $B$ , as shown in Fig. 1. Determine (a) the support reactions at  $A$  and  $B$ ; and (b) the displacement of point  $C$ .

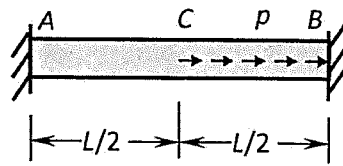


Fig. 1

2. (25%) A statically indeterminate beam  $AB$  supports a triangularly distributed load of maximum intensity  $q_0$  as shown in Fig. 2.

- (a) Determine the equation of the deflection curve.  
 (b) Find all support reactions.

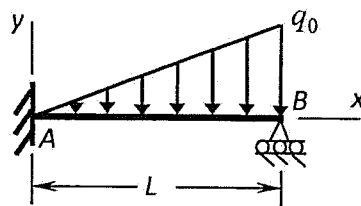


Fig. 2

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3. (25%) The state of plane stress at a point on a body is shown in Fig. 3.

- (a) Find the principal stresses and the maximum shear stress.
- (b) Explain if a state of plane stress is also a state of plane strain in general.

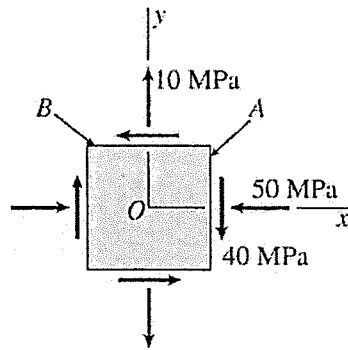


Fig. 3

4. (25%) (a) Derive the critical loads and corresponding deflected shapes for an ideal pin-ended column with flexural rigidity  $EI$ , as shown in Fig. 4(a). (b) Estimate the lowest critical load for the column with both ends fixed, as shown in Fig. 4(b).

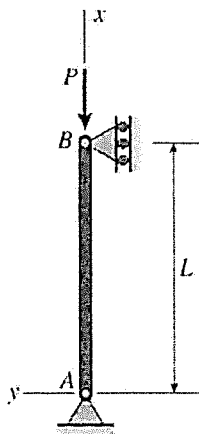


Fig. 4(a)

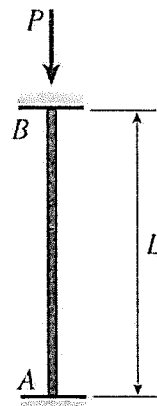


Fig. 4(b)