淡江大學九十三學年度碩士班招生考試試題

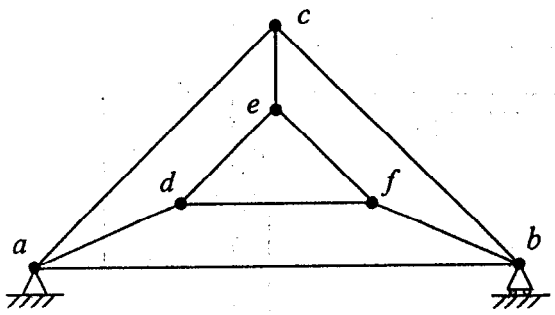
系別：土木工程學系　　科目：結　構　學

准帶項目請打「○」否則打「×」
簡單型計算機
○

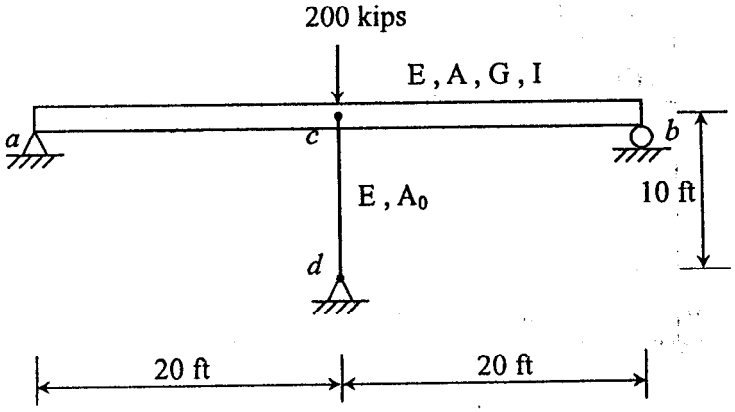
本試題共 2 頁

本試題雙面印製

1. For the structure shown below, please specify in detail why it is in a situation of **internal geometric instability**(內部幾何不穩定). Please explain the reason with the help of necessary sketches.(13%)



2. A structure is composed of horizontal member *ab* and vertical member *cd* as shown in the sketch. Please find the internal axial force of member *cd* by using the ***method of the least work*** under the cases including that: (i) only the flexural deformation of member *ab* is taken into account. (20%) (ii) both the flexural and shear deformations of member *ab* are taken into consideration. (10%)



※ **Given**：
$E = 29 \times 10^6$ psi
$G = 11.2 \times 10^6$ psi
$A = 4.0$ in^2
$A_0 = 1.0$ in^2
$I = 1.4$ in^4

* The Cross Section of member ab is assumed to be in rectangular shape.

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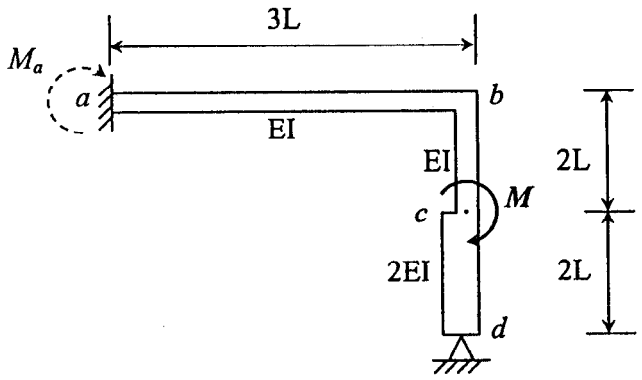
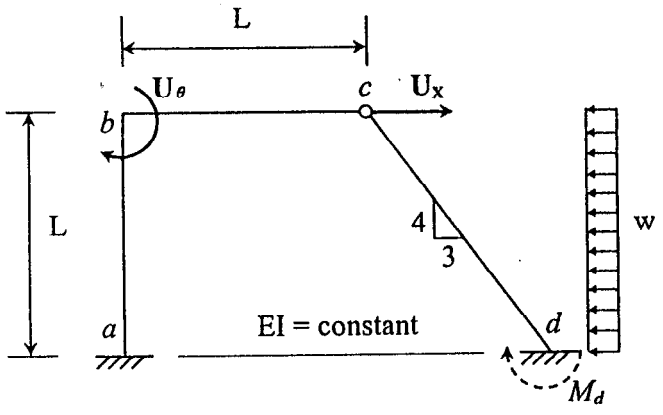
3. A rigid-joint frame is subjected to the moment ***M*** acting at point C as indicated in the figure. Please find the reaction M_a by using ***slope-deflection method.*** (25%)



※ **Given**：
L = 10 ft
M = 200 kips-ft

4. In undertaking the ***direct stiffness method*** (a formulation scheme in matrix displacement analysis), the system shown below is modeled by using the degrees of freedom U_X and U_θ. Please find the reaction M_d. (32%)



※ **Given**：
L = 20 ft
w = 3.0 kips/ft