

51-1

淡江大學 96 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

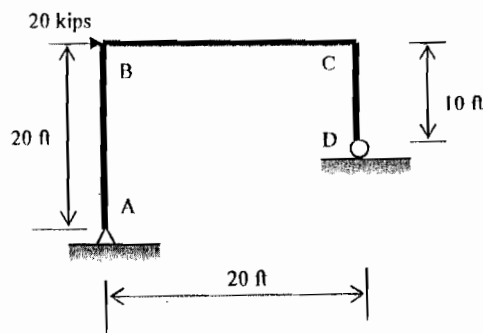
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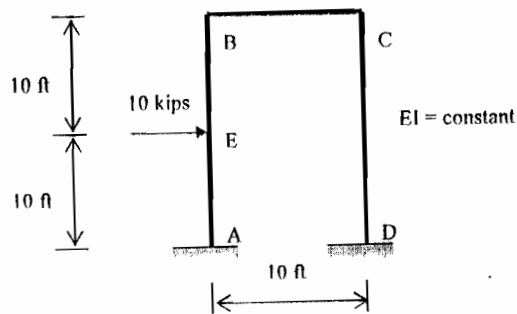
簡單型計算機

本試題共 乙 頁

1. Use method of virtual work, compute the horizontal displacement at roller-supported D of the frame shown in figure. $E = 30 \times 10^3 \text{ ksi}$, $I = 2000 \text{ in}^4$. (25%)



2. Use method of slope deflection, determine reactions of the given frame and plot the moment diagram. (25%)



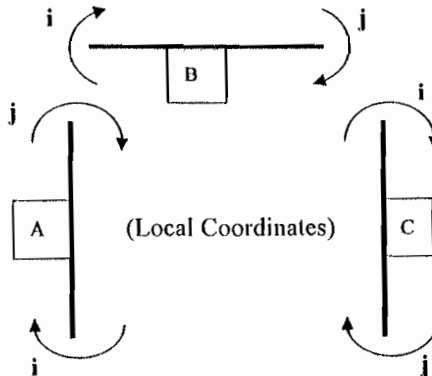
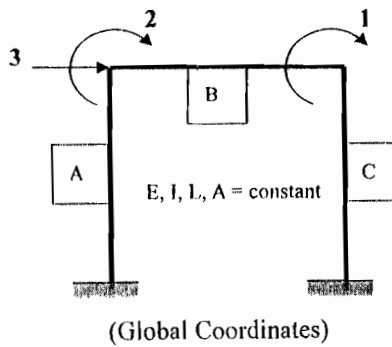
本試題雙面印製

◀ 注意背面尚有試題 ▶

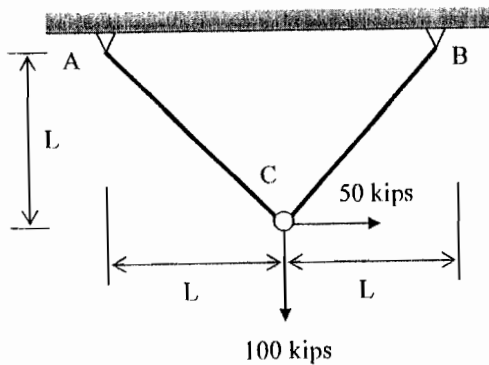
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3. The global coordinates of a plane frame structure and the local coordinates of each member are shown in the figures. Give brief answer to the following questions. (25%)

- (1) The stiffness matrix, $[k_{ij}]$, of a single member and the physical meaning of each element, k_{ij} , in the member stiffness matrix.
- (2) The member (local) coordinate given in the figure is the result of simplification. What is the complete local coordinates of a member? And, what are the assumptions used in the simplification?
- (3) What are the basic principles to establish the global coordinates: the location to set up a global coordinate and the minimum number of the required global coordinates to represent the original structure?



4. Determine the member forces of the given structure by matrix stiffness method. Approach this problem from the member stiffness matrix then construct the global stiffness matrix. (25%)



$E, A = \text{constant}$
 A, B, C are hinged connections