

系別：土木工程學系

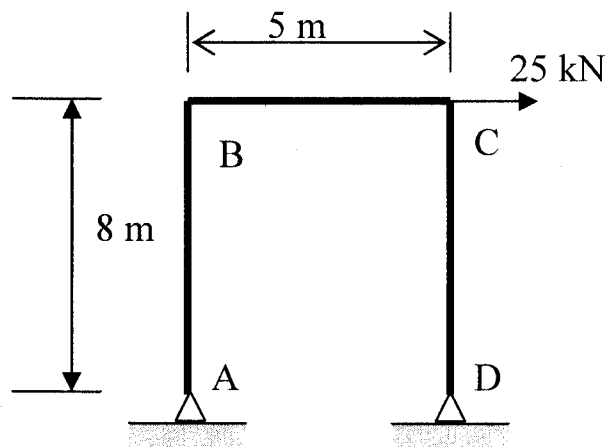
科目：結構學

考試日期：2月26日(星期日) 第2節

本試題共 4 大題， 2 頁

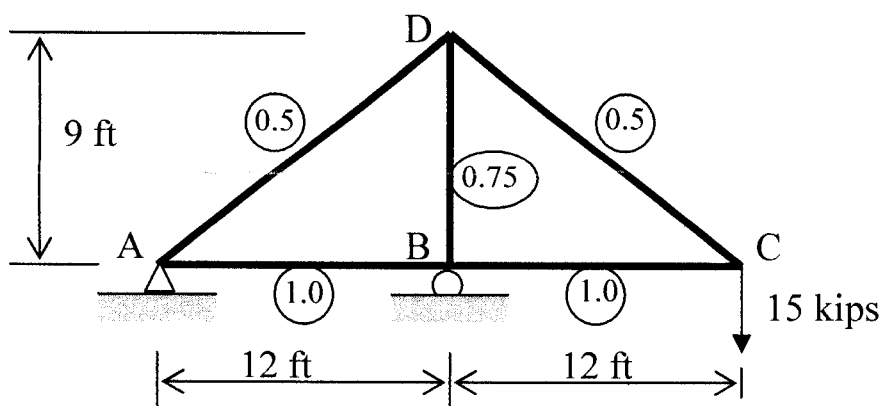
本試題雙面印刷

1. Use method of virtual work and consistent deformation to determine reactions of the frame shown in Figure 1, and draw moment diagram.  $EI = \text{constant}$ . (25%)



(Figure 1)

2. Determine the horizontal displacement of joint D of the truss shown in Figure 2.  $E = 29 \times 10^3 \text{ ksi}$ , number in the circle indicates the cross sectional area in  $\text{in}^2$ . (25%)



(Figure 2)

# 淡江大學 101 學年度碩士班招生考試試題

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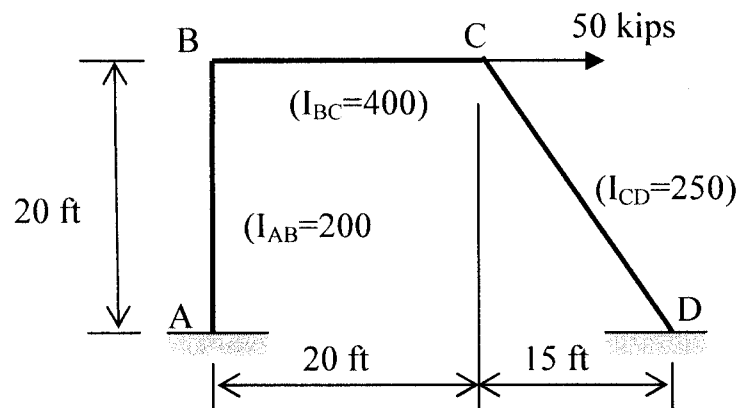
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3. Use method of slope deflection; determine the moments at each joint of the frame shown in Figure 3, and draw moment diagram. (25%)



(Figure 3)

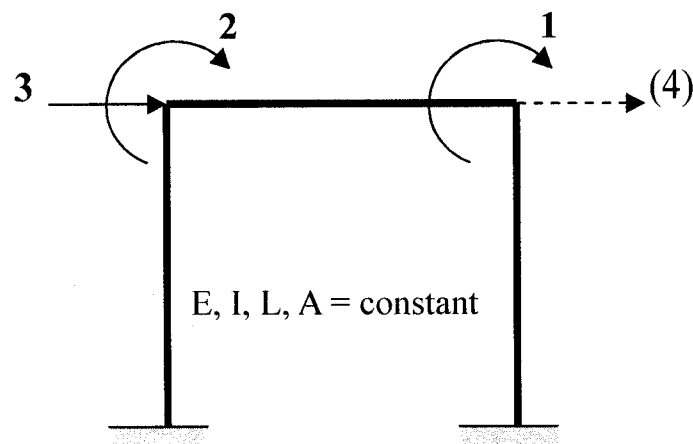
4. The global coordinates (1, 2 & 3) for a plane frame structure consisted of flexural members are shown in Figure 4. (25%)

(1) Derive the global stiffness matrix,  $[k_{ij}]$ .

(2) Explain the physical meaning of each element,  $k_{ij}$ , in the stiffness matrix.

(3) What is the structural behavior if Coordinate 3 is missing?

(4) What will happen if Coordinate 4 is added to the system?



(Figure 4)