系所組別：土木工程學系甲、丁組

考試科目：結構學　　　　　　　　　　　　　　　　　　　　考試日期：0223，節次：2

※ 考生請注意：本試題不可使用計算機

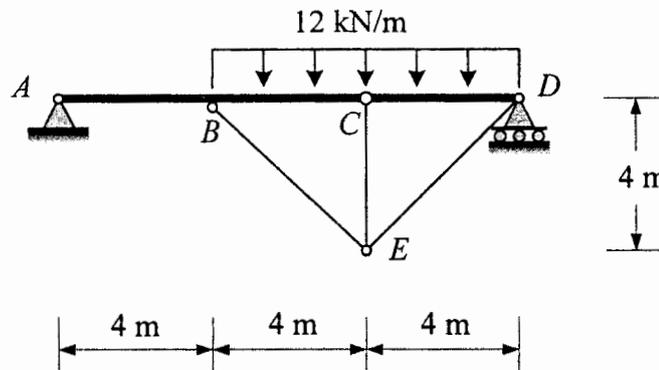1. Draw the axial-force, shear and moment diagrams for beam *ABCD* of the structure. (25%)

Figure 1

2. Use the unit-load method (also referred to as the method of virtual work) to determine the horizontal and vertical deflections of joint *C* of the truss. The two springs each have an undeformed length of 6 m and a stiffness of $k = 2 \times 10^4$ kN/m. For all other members, the axial rigidity *EA* is 5×10^4 kN. (25%)
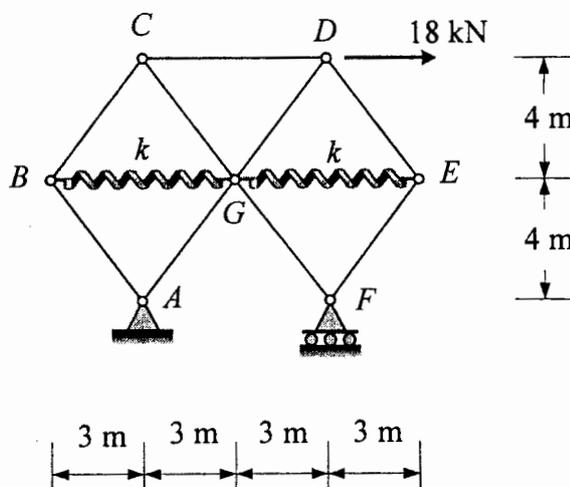

Figure 2

※ 考生請注意：本試題不可使用計算機

3. Use the moment-distribution method to determine the internal moments at joints B and C, then find the support reaction at D. The flexural rigidity EI is constant throughout the frame. (25%)
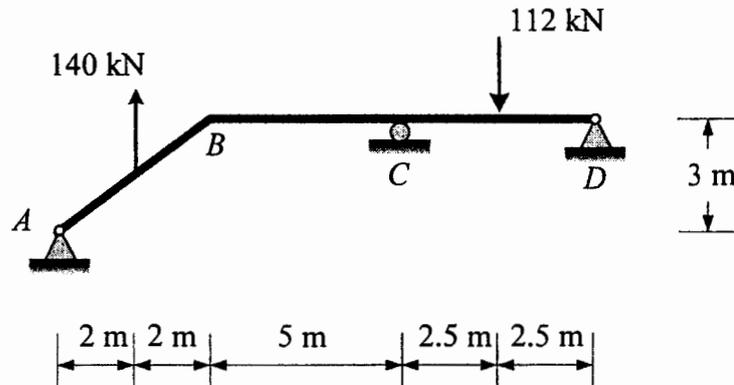

Figure 3

4. Use the matrix stiffness method to determine the displacements of joints B and D, then compute the shears and moments acting at the ends of member BC. The flexural rigidity EI is constant throughout the frame. Neglect the effects of axial and shear deformations. (25%)
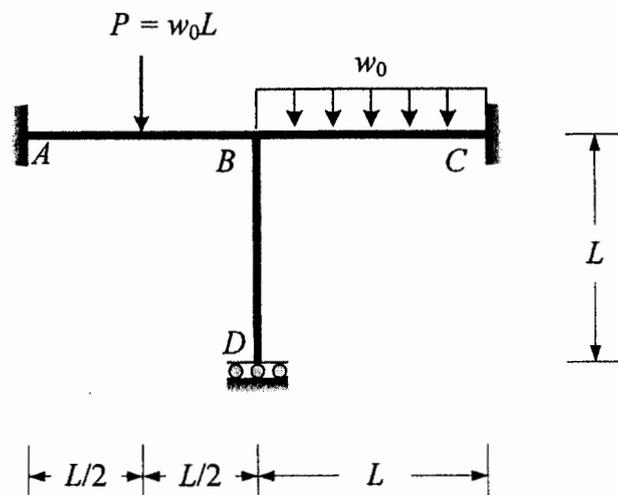

Figure 4