本試題是否可以使用計算機：☑可使用 ，□不可使用 （請命題老師勾選）

1. Using the method of consistent deformations (that is, the force method), determine the reaction at *C* and the force in member *BE* for the truss and load *P* shown in Figure 1. The axial rigidity *EA* is the same for all members. (25%)

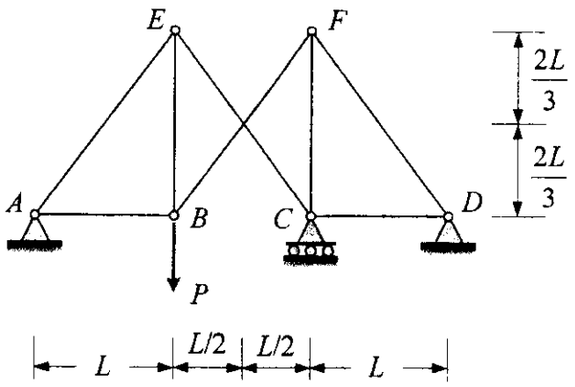

Figure 1

2. Using the sign conventions for shear *V* and bending moment *M* as shown in Figure 2-1, determine
   (a) the absolute maximum positive moment,
   (b) the absolute maximum negative moment, and
   (c) the absolute maximum negative shear
   for the beam and moving loads shown in Figure 2-2. (25%)

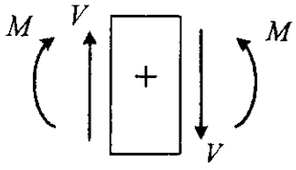

Figure 2-1

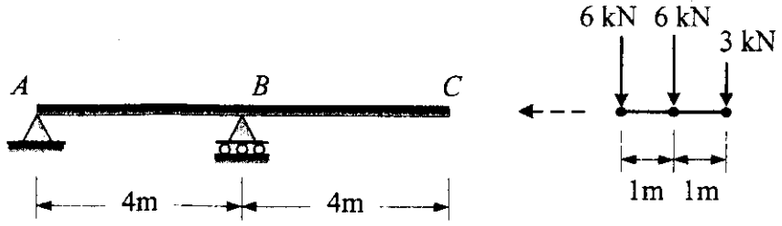

Figure 2-2

(背面仍有題目,請繼續作答)

3. The frame shown in Figure 3 is subjected to a uniform load w_0 on member BC. Using the slope-deflection method,

(a) determine the rotation of joint B, and then

(b) draw the moment diagram for the frame.

The flexural rigidity EI is constant throughout the entire frame. (25%)

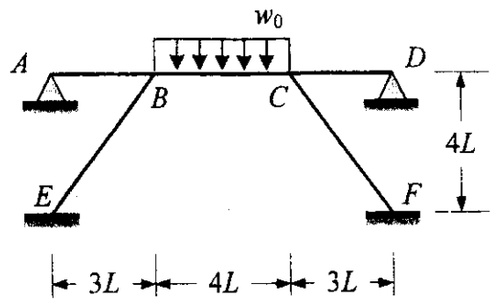

Figure 3

4. Assume that all the members of the truss shown in Figure 4 have the same axial rigidity EA and coefficient of thermal expansion α.

(a) Using the numbering of joint displacements as shown in the figure, determine the stiffness matrix $\mathbf{K}_{3\times3}$ for the truss.

(b) If the entire truss is subjected to a temperature increase ΔT, determine all possible joint displacements.

(25%)

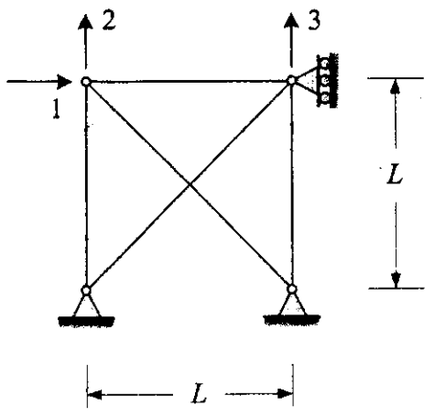

Figure 4