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) Draw the influence lines for the bar forces in members *ab* and *bc* if the live load is applied to the truss in Fig. 1 through the lower chord. (25%)
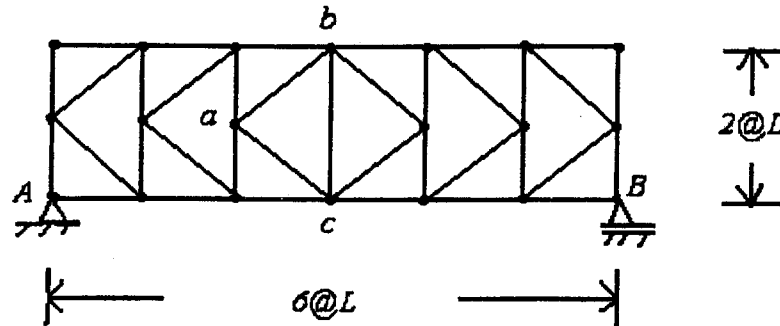


Figure 1

(2) A compound beam system under a concentraded load $P$ at point $B$ is considered and shown in Fig. 2.

(a) Determine the spring forces of spring *BE* and *EF*. $EI$= constant and $k$=the spring constant. (13%)

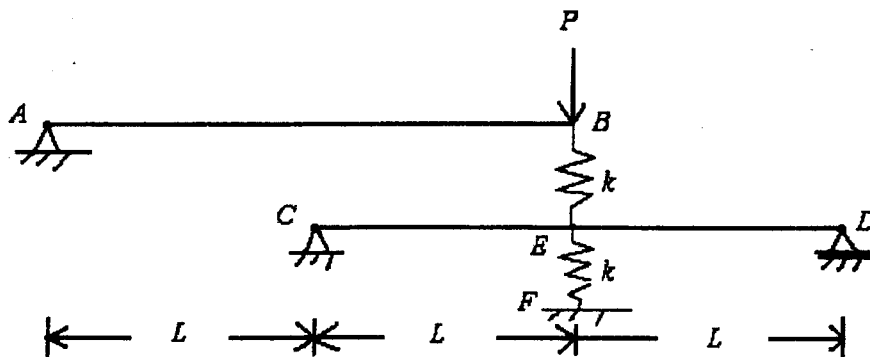(b) Let $\dfrac{1}{k} = \dfrac{L^3}{6EI}$ and determine the vertical displacement of point $B$. (12%)



Figure 2

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）

(3) Determine the end moments of each member of the frame in Fig. 3,

    (a) using the method of slope deflection. (13%)

    (b) using the method of moment distribution. (12%)
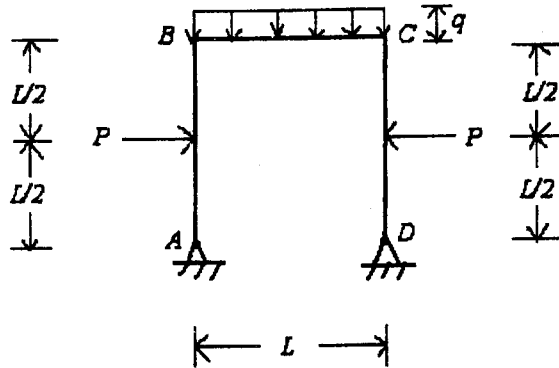
$EI$=constant.



Figure 3

(4) Determine the fixed end moment at point $B$ (i.e., $M_B(x)$) of the statically indeterminate beam in Fig. 4, as a unit load is applied on the beam and moves from point $A$ to point $B$. The coordinate $x$ is measured from point $A$ and $EI$=constant. (25%)
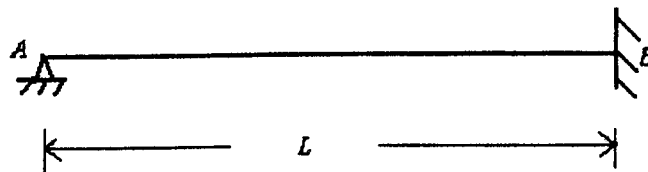


Figure 4