

國立交通大學 102 學年度碩士班考試入學試題

科目：結構學(3053)

考試日期：102 年 2 月 4 日 第 3 節

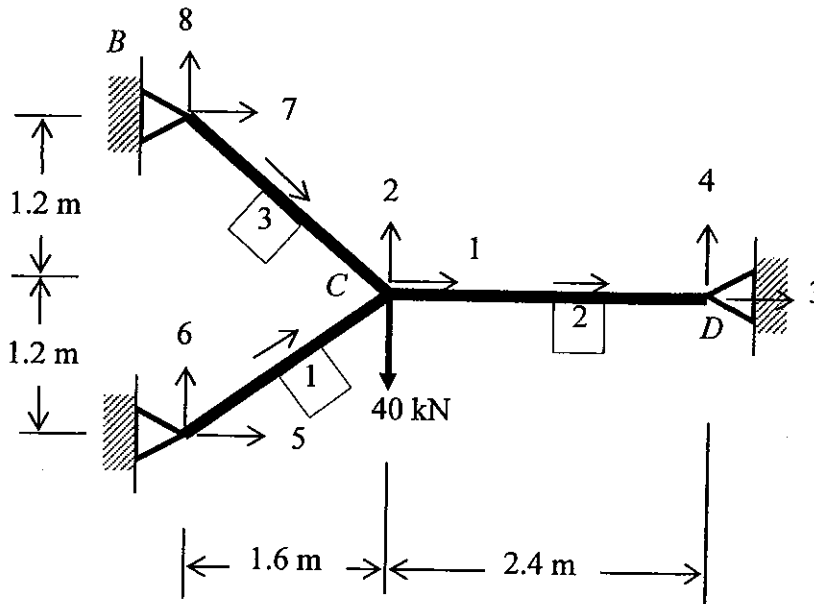
系所班別：土木工程學系

組別：土木系甲組-一般生

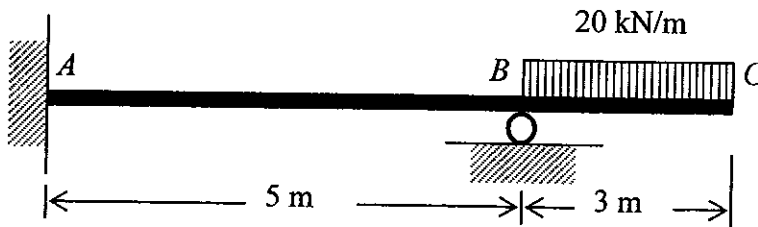
第 1 頁, 共 2 頁

【可使用計算機】\*作答前請先核對試題、答案卷(試卷)與准考證之所組別與考科是否相符!!

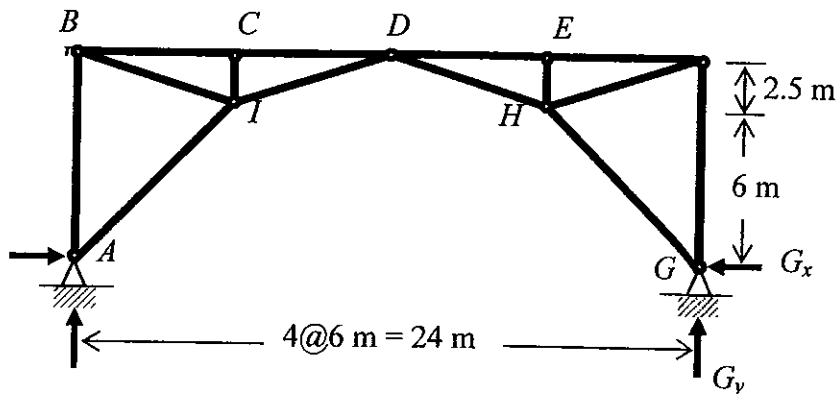
1. Determine the structure stiffness,  $K$ , for the following truss using the stiffness method.  
 $EA = 6 \times 10^4 \text{ kN}$  for each member. (15%)



2. Using the slope-deflection method to determine the moment at  $A$  and  $B$  and draw the moment diagram for the following beam. The support at  $B$  settles 100 mm. Take  $I = 4 \times 10^6 \text{ mm}^4$  and  $E = 250 \text{ GPa}$ . (15%)

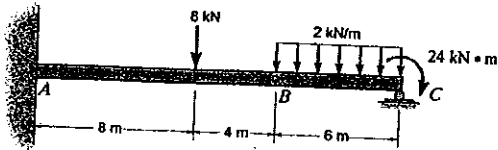


3. Determine and draw the following influence lines for the given truss: (a) reaction  $G_y$ ; (b) reaction  $G_x$ ; (c) force in bar  $DE$ ; (d) force in bar  $HF$ . (20%)

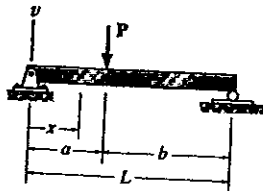


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4. Draw the shear and moment diagrams. (15%)



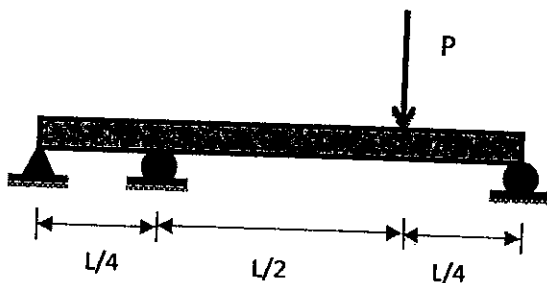
5. Giving the deflection equation as follow: (15%)



$$v = -\frac{Pbx}{6LEI}(L^2 - b^2 - x^2)$$

$$0 \leq x \leq a$$

Find the displacement at the loading point of the beam structure as shown.  $EI$  is constant.



6. Analyze the member end moments by moment distribution method. And find the reactions at the supports. (20%)

