

國立成功大學

111學年度碩士班招生考試試題

編 號： 97

系 所： 土木工程學系

科 目： 結構學

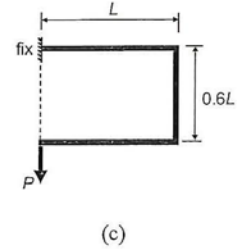
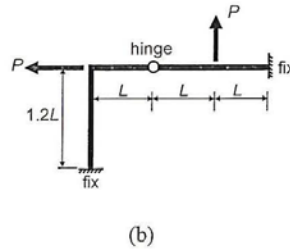
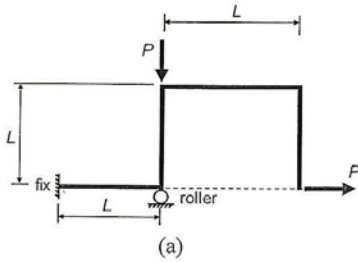
日 期： 0219

節 次： 第 2 節

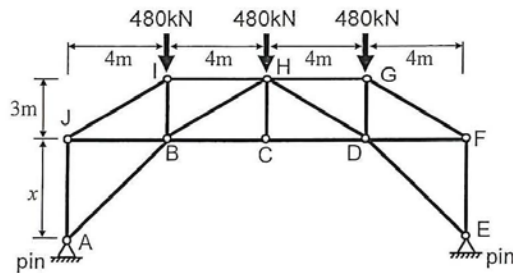
備 註： 可使用計算機

※ 考生請注意：本試題可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

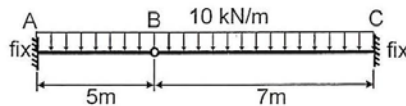
1. Draw bending moment diagram of the frames below, draw the bending moment on the compression side: (10%, 10%, 10%)



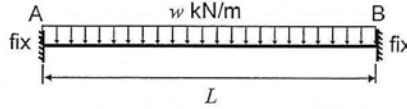
2. Consider the truss structure shown below, determine the minimum value of x so that the axial force in truss element AB does not exceed 700kN. (20%)



3. Compute the reactions at Points A and C, and the vertical displacement and rotation at Point B using either slope-deflection or moment distribution method. $E = 200 \text{ GPa}$, $I = 200 \times 10^6 \text{ mm}^4$. (15%)



4. Consider the beam with fix ends at its two ends and a uniform load with w kN/m as shown below, prove that the moments at Points A and B are $\frac{wL^2}{12}$. (15%)



5. Use stiffness matrix method to analyze the frame structure shown below considering a horizontal force of 100kN acting at Point C, take both flexural stiffness and axial stiffness into consideration. Please follow the order of degree-of-freedom shown in the figure. $E = 200\text{GPa}$, $I_{AB} = I_{BC} = 5 \times 10^6 \text{ mm}^4$, $A = 4000 \text{ mm}^2$. Compute the reactions at the boundaries and the lateral displacement at Point C. (20%)

