國立暨南國際大學九十五學年度碩士班研究生入學考試試題　第2節

科目：結構學　適用：土木所耐震

編號：464

考生注意：
1.依次序作答，只要標明題號，不必抄題。
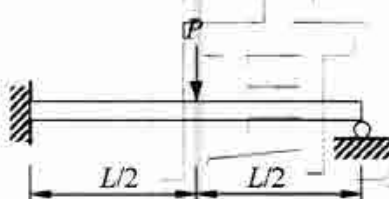2.答案必須寫在答案卷上，否則不予計分。
3.限用藍、黑色筆作答；試題須隨卷繳回。

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第　1　頁

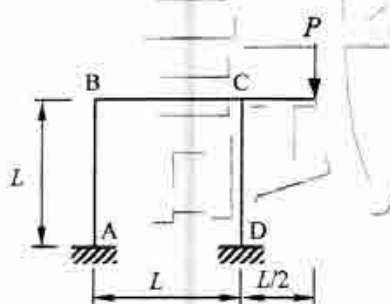1. The three equations of static equilibrium for an arbitrary planar structure are as follows

$$\sum P_y = 0; \quad \sum M_A = 0 \quad ; \quad \sum M_B = 0,$$

where the subscript y represents the y axis of a planar Cartesian x-y coordinate system, and the subscript A and B represent two points on the xy plane. Please prove that, for the three equilibrium equations to be valid, the line connecting points A and B must not be perpendicular to the y axis (or, equivalently, must not be parallel to the x axis). (25%)

2. Please compute all the support reactions, the mid-span member forces and the mid-span deflection of the beam as shown. The flexural rigidity of the beam is EI. (25%)

3. Please compute and plot the bending moment diagram of the frame structure as shown. The flexural rigidity of all the structural members is EI. (25%)

4. Please derive the stiffness matrix for a planar beam element. The beam element should have 6 degrees of freedom. (25%)