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
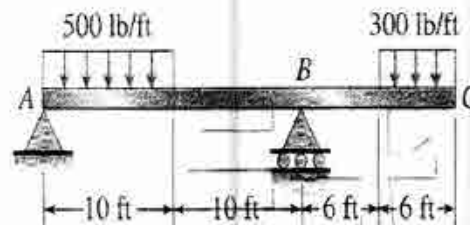
科目：材料力學　適用：地震所

編號：492

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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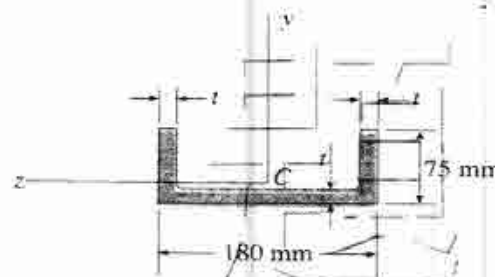第 　 頁

(1) A bar AB having length L and axial rigidity EA is fixed at end A (see figure). At the other end a small gap of dimension s exists between the end of the bar and a rigid surface. A load P acts on the bar at point C, which is two-thirds of the length from the fixed end. If the support reactions produced by the load P are to be equal, what should be the size s of the gap? (20%)

(2) Draw the shear-force and bending-moment diagrams for this beam. (20%)

(3) A beam having a cross section in the form of a channel (see figure) is subjected to a bending moment acting about the z axis. Calculate the thickness t of the channel in order that the bending stresses at the top and bottom of the beam will be in the ratio $7:3$, respectively. (20%)

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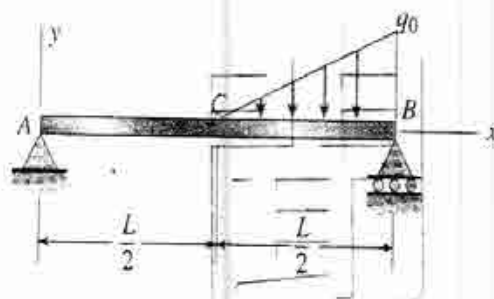1.依次序作答，只要標明題號，不必抄題。
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(4) Derive the equations of the deflection curve for a simple beam AB supporting a triangularly distributed load of maximum intensity q_0 acting on the rigid-hand half of the beam (see figure). Also, determine the angles of rotation θ_A and θ_B at the ends and the deflection δ_C at the midpoint. (20%)

(5) An element in plane stress is subjected to stresses $\sigma_x = 6800\ psi$, $\sigma_y = 2000\ psi$, and $\tau_{xy} = 2750\ psi$, as shown in the figure. Determine the stresses acting on an element oriented at an angle $\theta = 60^0$ from the x-axis, where the angle θ is positive when counterclockwise. Show these stresses on the sketch of an element oriented at the angle θ. (20%)

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