

淡江大學 104 學年度日間部轉學生招生考試試題

系別：土木工程學系三年級

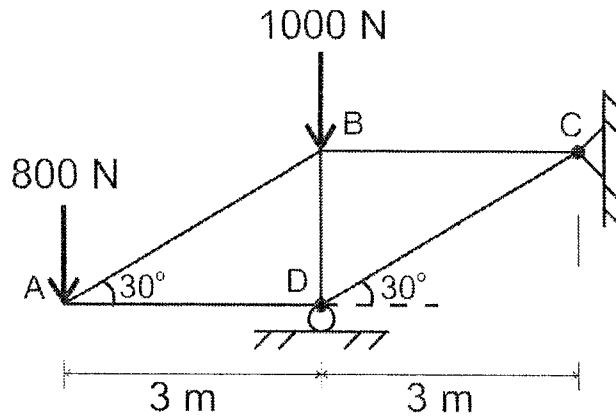
科目：工程力學(含靜力學、材料力學)

考試日期：7月26日(星期日) 第3節

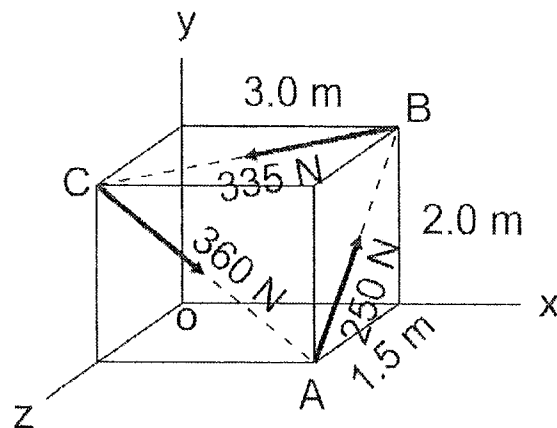
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本試題雙面印刷

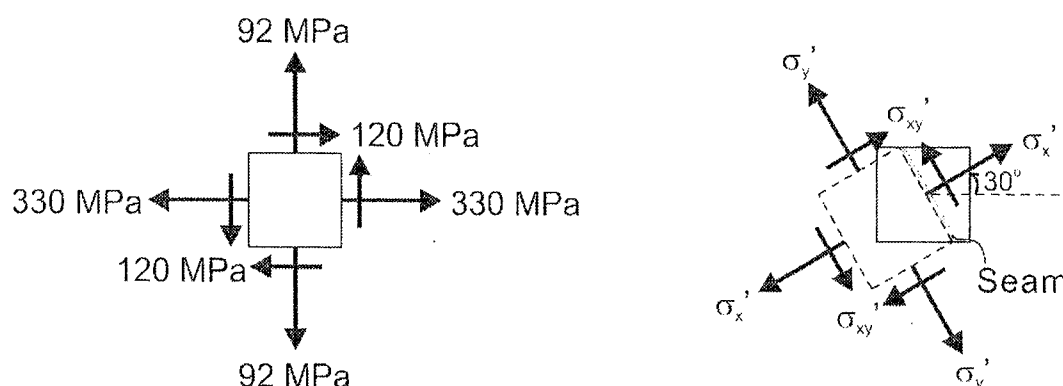
1. (25%) Please use the method of joints to determine the force in every member of the truss shown below. Note that you have to state clearly that the members are in tension or compression.



2. (25%) Please replace the system of three forces exerted to the rigid cube shown in the figure with a force \mathbf{R} through origin O and a couple \mathbf{M}_0 of moment.
- What is the magnitude of the force \mathbf{R} ?
 - What are the magnitude and direction angles of the couple \mathbf{M}_0 of moment?



3. (20%) A material made of rubber is subjected to stresses $\sigma_x = 330$ MPa, $\sigma_y = 92$ MPa and $\sigma_{xy} = 120$ MPa. Please use Mohr's circle to determine the normal stresses σ_x' , σ_y' and the shear stress σ_{xy}' for the plane along the seam in the rubber material shown in the figure.



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4. A beam is loaded and supported as shown in the figure. The cross section of the beam is rectangular with width $b = 0.25$ m and height $h = 0.40$ m presented in the figure below. The beam is adequately supported against sideways buckling.

(15%) (1) Please draw shear and bending moment diagrams of the beam and provide the complete information of the shear force and bending moment values in these two diagrams.

(15%) (2) Determine the normal stress σ_c and shear stress τ_c at the point α in the cross section located at point C shown in the figure below.

