

淡江大學 102 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24日(星期三) 第3節

本試題共 4 大題， 2 頁

本試題雙面印刷

1. Determine the reaction force of each support of the truss shown in Figure 1. (20%)
2. Plot the shear and bending moment diagrams of the beam shown in Figure 2. (25%)
3. A composite beam is shown as Figure 3, which consists of steel and aluminum material. The elastic modulus coefficients of steel and aluminum are $E_A = 75GPa$ and $E_S = 200GPa$ respectively. Please calculate the maximum bending moment stress of steel when the maximum bending moment stress of aluminum is $75MPa$. (25%)
4. Consider the combined torsion and expansion of a cylinder of radius R as shown in Figure 4,
 - (1) Solve for the maximum principal stress σ_{max} and the maximum shear stress τ_{max} in term of P , T , and R . (15%)
 - (2) Assume that material separation takes place in a direction normal to σ_{max} and that failure occurs when $\sigma_{max} = \sigma_{cr}$ for a given material. If $\sigma = 0.65\sigma_{cr}$, find the maximum allowable T and the failure plane measured by θ . (15%)

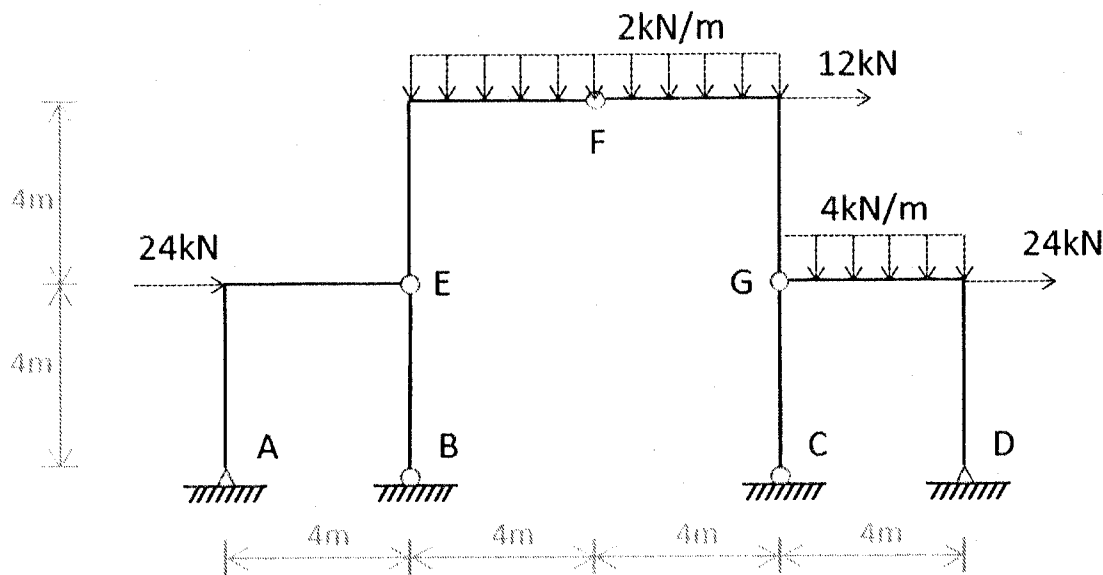


Figure 1

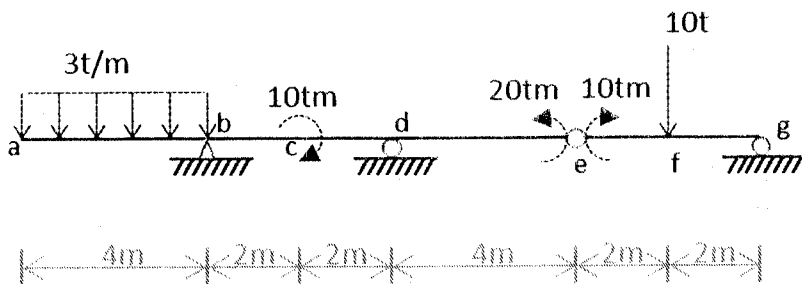


Figure 2

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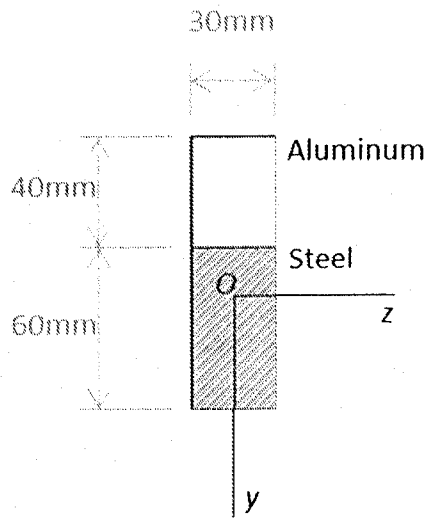


Figure 3

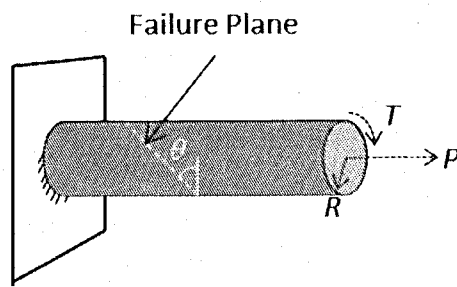


Figure 4