

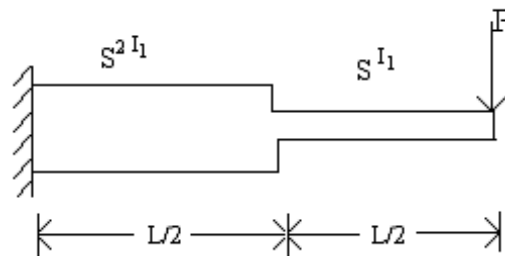
III B.Tech I Semester Supplementary Examinations, April/May 2005
AERO SPACE STRUCTURES-I
(Aeronautical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Consider a solid circular shaft subject to a twisting moment of 2 KNm together with a bending moment of 3KNm. The diameter of the shaft is 100mm. Determine principal stresses and maximum shearing stress in the shaft.
2. Determine the diameter 'd' of a circular shaft subjected to a bending moment M and torque T, according to
 - (a) Maximum Normal stress theory,
 - (b) Maximum Shear stress theory.
3.
 - (a) Write a note on the 'Use of Factor of safety'.
 - (b) Discuss in brief 'Designing for fatigue loading'.
4.
 - (a) Differentiate between Primary shear and Secondary shear in rivets.
 - (b) What are the assumptions for the design of eccentrically loaded rivetted joints.
5. Explain Moment-Area method of determining slope and deflection of beams under loading with an example, for statically determinate case.
6. State and prove Clapeyrons theorem of three moments. Write these from the simplified form of the equation for a beam simply supported at the ends and having only one support between the ends.
7. A Cantilever beam of stepwise constant cross-section as shown below is loaded by a concentrated load at its tip.



Determine the deflection under the point of application of load P by Castigliano's theorem.

8. Two identical bars are pin-jointed and support a load ϕ as shown below. Determine the vertical displacement of point 'B' by energy method.

