

**III B.Tech II Semester Supplementary Examinations,  
November/December 2005  
AEROSPACE STRUCTURES-II  
(Aeronautical Engineering)**

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. Determine the maximum bending stress for an aluminium beam with z cross section as shown in the figure 1 if the bending moment about the z axis is 5000 Nm and  $d=3$  cm ,  $b= 3$ cm ,  $t= 0.5$  cm.

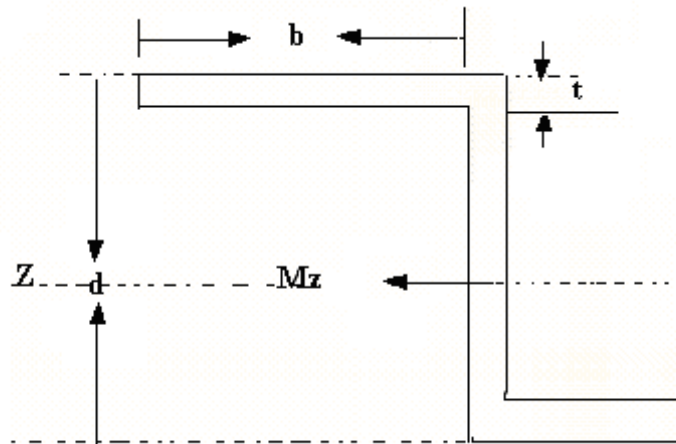


Figure 1:

2. The singly symmetrical fuselage cross section shown in figure 2 is subjected to a bending moment of  $10^5$  N about a horizontal axis. If all the direct stress are carried by the booms determine the average direct stress in each boom. [16]
3. Describe the terms shear centre, shear flow and shear lag and discuss their significance. [16]
4. Find the expressions for the angle of twist per unit length for an open thin walled cylinder if a torque T is applied on it. [16]
5. What is a pure tension field beam called, give an example of it and derive the expression of the stresses associated with this beam. [16]
6. Write notes on the following [16]
  - (a) Elastic axis and shear centre
  - (b) Sheet wrinkling failures

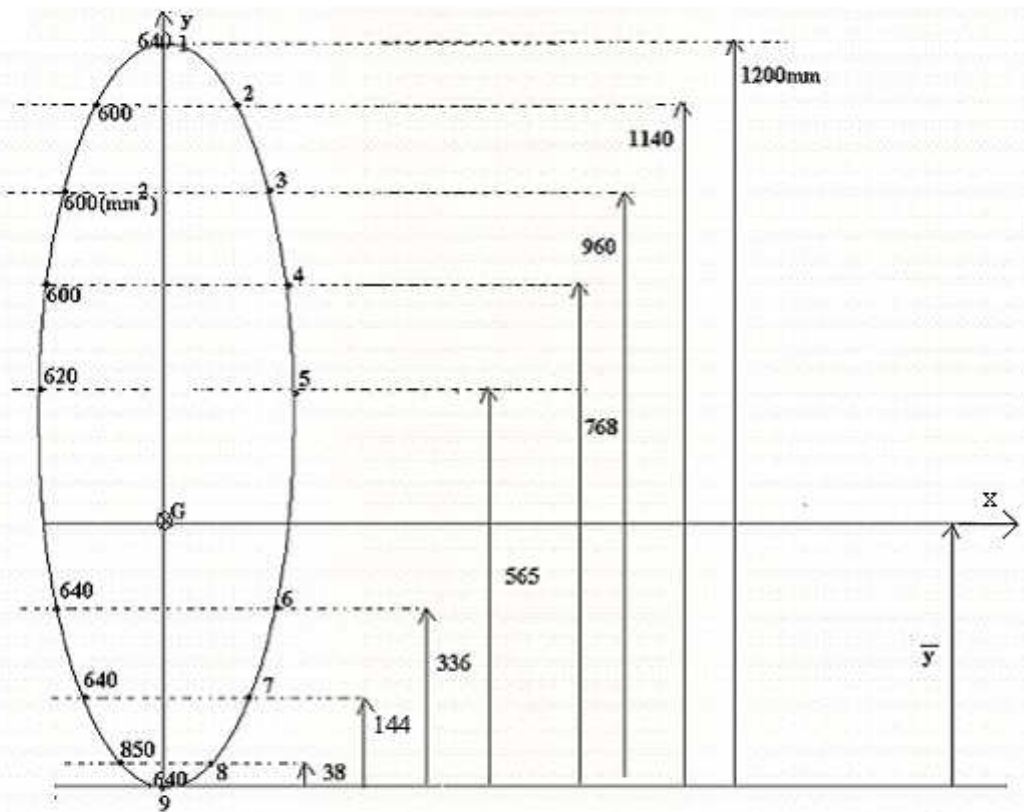


Figure 2:

- (c) Neuber tubes.
7. Describe the process of finding the crippling stress of a plate by Needham's and Gerard's method. [16]
8. Find the shear flow distribution in the rectangular section shown in figure 3, given the walls are effective in bending as well as shear. [16]

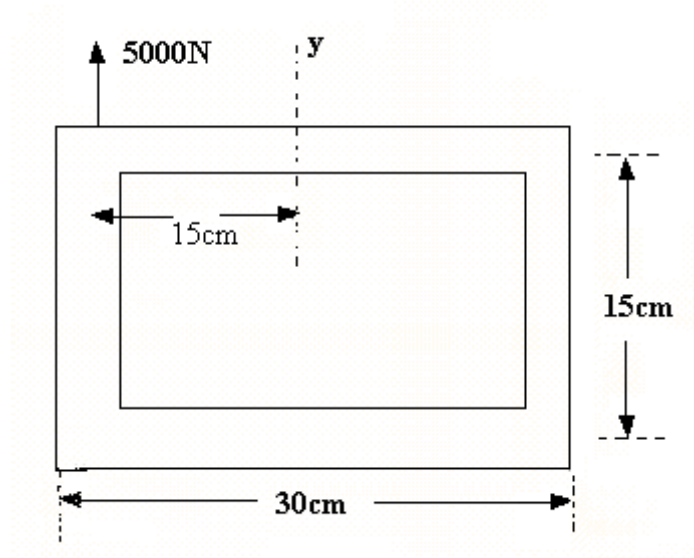


Figure 3:

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