Code No: 07A62102 **R07** **Set No. 4**

III B.Tech II Semester Regular/Supplementary Examinations,May 2010
Aerospace Vehicle Structures -II
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the effect of riveting a long flat plate to a stiffener at regular intervals, in terms of its buckling response
   (b) Calculate crippling stress for the given extrusion section. Assume E=75 GPa, Thickness of web is 1.5mm and thickness of flanges is 2mm. Shown in figure 1b. [6+10]

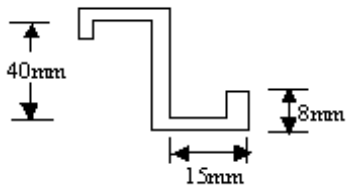

Figure 1b

2. What are the various types of wing structures? Show the construction with different types of stringers and web? [4+12]

3. Derive the expression for the total torque of 'I' section beam subjected to torsion With the help of neat sketches. [16]

4. (a) Derive an expression for the angle of diagonal tension.
   (b) Find the shear flow in each web of the beam shown in the figure 4b. Plot the distribution of axial load along each stiffening member when P_1=20kN and P_2=10kN. All dimensions are in cm. [6+10]

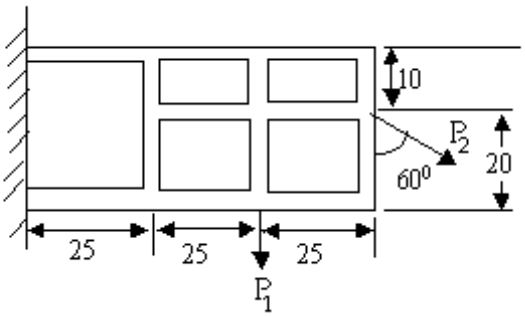

Figure 4b

5. (a) What is effective width of the sheet. Explain with neat sketches.
   (b) Explain plastic buckling of flat sheet with graphs and neat sketches and derive the expression for equivalent $L'/\rho = (\pi/\sqrt{3.62})s/t$

where L' = effective length . ρ= radius of gyration. S = distance between rivets along the direction of load application. t = thickness of the sheet. [4+12]

6. (a) What do you mean by shear centre? Explain with the help of neat sketch. Define shear flow? Explain the concept of shear flow in thin walled beams with the help of a neat sketch. [4+12]

7. Derive the expression for the total torque of Unlipped 'T' section beam subjected to torsion with the help of neat sketches. [16]

8. (a) Discuss the effect of torsion in open section beams and derive the equations for Shear stress distribution and the maximum shear stress due to applied torque.

   (b) Explain primary and secondary warping with the help of equations in terms of applied torque. [8+8]

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