R09

Code No: C7607

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH I SEMESTER EXAMINATIONS APRIL/MAY-2012
FLIGHT VEHICLE STRUCTURES
(AEROSPACE ENGINEERING)

Time: 3hours **Max.Marks:60**

Answer any five questions
All questions carry equal marks
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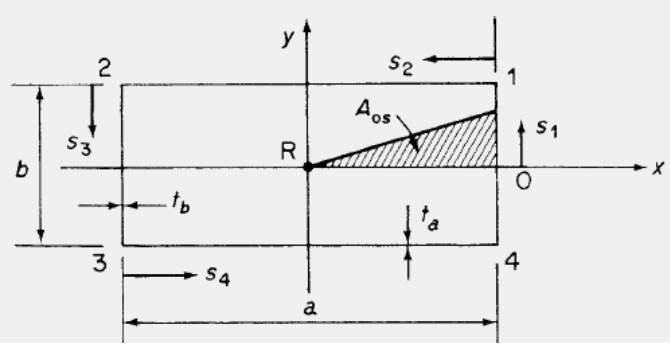
1. Explain the following with the help of figures.
   a) Loads on aircraft structural components.
   b) Functions of aircraft structural components.
   c) Pressure distribution over an airfoil.

2. Determine the warping distribution in the doubly symmetrical rectangular, closed section beam, shown in figure below, when subjected to an anti-clock wise torque T.



3. Derive the equations to find out the shear forces per unit length of a plate subjected to a distributed transverse load.

4. Derive an equation for the critical stress in a thin flat plate due to buckling.

5. Determine the neutral axis position and direct stress of a thin walled beam due to bending.

6. Explain shear center. Derive the equation to find out the shear of open section beams.

7. Determine the shear flow distribution in the web of the tapered beam shown in figure below, at a section midway its length. The web of the beam has a thickness of 2 mm and is fully effective in resisting direct stress. The beam tapers symmetrically about its horizontal centroidal axis, and the cross-sectional are of each flange is 400 $mm^{2.}$

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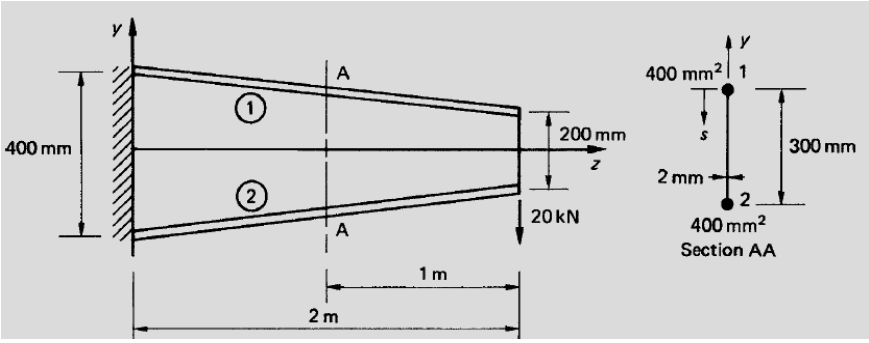

8.a) Explain structural health monitoring.
b) Explain different applications of smart materials.

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