

R9

Code: 9A21504

B.Tech III Year I Semester (R09) Supplementary Examinations, May 2012

AEROSPACE VEHICLE STRUCTURES - II

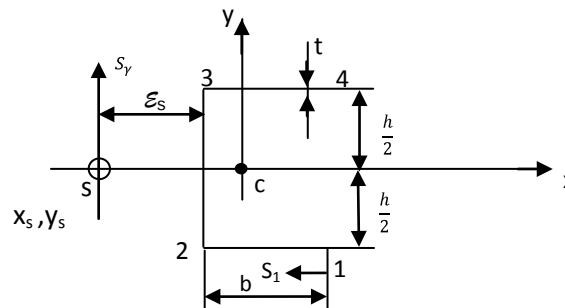
(Aeronautical Engineering)

Time: 3 hours

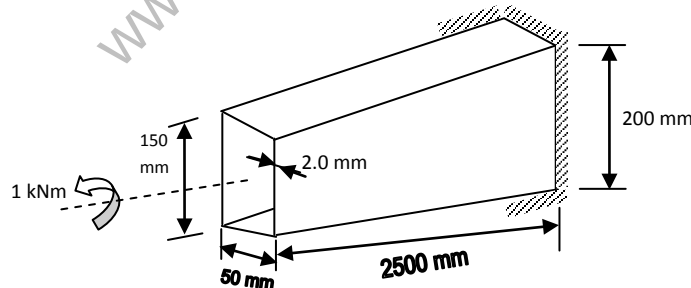
Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Derive the general Wagner equations for the tension field beam theory.
- 2 Calculate the position of the shear center of the thin-walled channel section shown in figure. The thickness t of the walls is constant.



- 3 (a) Explain about columns subjected to local crippling failure with graph neat sketches.
(b) Derive formula for a column both ends hinged and loading P.
- 4 (a) Derive the simple derivation of torsion bending equation.
(b) Explain the Phenomena of warping.
- 5 Derive the approximation formulae for semi-tension field beam.
- 6 Shows a thin-walled cantilever box beam having a constant width of 50 mm and a depth which decreases linearly from 200 mm at the built-in end to 150 mm at the free end. If the beam is subjected to a torque of 1 kNm at its free end, plot the angle of twist of the beam at 500 mm intervals along its length and determine the maximum shear stress in the beam section. Take $G = 25000 \text{ N/mm}^2$.



- 7 Write short notes on the following:
(a) Beam, Frame, and Truss.
(b) Sketch tapered wing and fuselage.
- 8 (a) Explain Monocoque and semi Monocoque structure.
(b) Sketch the shear flow variation over the symmetrical wing and fuselage.
