Code: 9A21503

R09

B.Tech III Year I Semester (R09) Supplementary Examinations December 2015

AERODYNAMICS – II

(Aeronautical Engineering)

Time: 3 hours Max Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) Write about the classification of compressible flow based on the local flow Mach number.
(b) Derive momentum equation in integral form for a control volume.

2 Explain the nature of the flow in a convergent – divergent nozzle for the supply pressure constant and the back pressure is varied.

3 Derive normal shock relations and Hugoniot equation for one dimensional compressible flow.

4 Describe Prandtl – Meyer expansion through a sketch and derive expressions for calculation of a Prandtl – Meyer expansion wave.

5 Explain the nature of supersonic flow over finite rectangular and swept back wings.

6 Describe the characteristic features of hypersonic flows. Explain Newtonian flow model for hypersonic flows and derive expression for pressure coefficients.

7 Explain the importance of flow visualization in gas dynamic systems. Describe briefly any two flow visualization techniques employed in compressible flows.

8 Write short notes on the following relating to wind tunnels:
(a) Horizontal buoyancy.
(b) Flow angularity.

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