R09

Code No: C7606
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I Semester Examinations March/April-2011
AERODYNAMICS OF FLIGHT VEHICLES
(AEROSPACE ENGINEERING)

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

Answer any five questions
All questions carry equal marks
- - -

1.   Discuss the properties of symmetric and cambered airfoils. Compare the circulation distribution and aerodynamic characteristics of symmetric and cambered airfoils.   [12]

2.   Prove that elliptic distribution of lift over a finite wing yields minimum induced drag.   [12]

3.   Compare the subsonic and supersonic airfoils and their aerodynamic characteristics.   [12]

4.   Discuss Prandtl – Glauert – Goethert transformation.   [12]

5. a)   Derive Crocco's relation
$$\frac{\partial S}{\partial y} = \frac{u}{T} \quad \text{and} \quad V = \frac{u}{T}\omega$$

   b)   Discuss the solution of energy equation for Prandtl number unity.   [12]

6.   Briefly discuss:
      a)   Compressibility, turbulence and noise and Centrifugal instability.
      b)   Flow around spheres and circular cylinders.   [12]

7.   Discuss fully developed flows in tubes and channels.   [12]

8.   Discuss airfoil design for maximum lift coefficient.   [12]

* * * * *