CODE NO: RO 5322104

2008 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH SEMESTER SUPPLEMENTARY EXAMINATIONS
COMPUTATIONAL AERO DYNAMICS
(AERONAUTICAL ENGINEERING)

AUG/SEP 2008

TIME : 3 HR
MARK : 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the physical meaning of Divergence of Velocity that frequently appears in the equations of fluid dynamics.

(b) Define what is substantial Derivative and explain its physical meaning.

2. Derive the two integral forms of continuity equation on the basis of flow models of control volume fixed in space and control volume moving with the fluid.

3. Write short notes on the following:

(a) Strong and weak conservation forms of governing equations.

(b) Shock capturing method.

4. Write short notes on the following:

(a) Well-posed problems.

(b) Newmann and Dirichlet boundary conditions.

5. (a) Explain the implicit formulation with an example.

(b) What is the use of Thomas algorithm.

6. What are metrics and derive the relationship between the direct and inverse metrics.

7. Explain the elliptic grid generation with simply connected domain and doubly connected domain.

8. Write a short notes on:

(a) Elliptic grid

(b) Parabolic grid

(c) Hyperbolic grid.