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Question Paper Code: 1107004

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024

Seventh Semester

Aerospace Engineering

U20AS702 – COMPUTATIONAL FLUID DYNAMICS FOR AEROSPACE ENGINEERING

(Regulation 2020)

Time: Three Hours

Maximum: 100 Marks

Answer ALL questions

PART – A

(10 x 2 = 20 Marks)

1. Recall the Governing equation for mass?
2. List the Most important properties of discretization?
3. What is the Need for grid generation?
4. What are the applications of CFD?
5. What are mathematical problems in CFD?
6. List the examples for heat conduction problems?
7. What are the methods in discretization?
8. Write the convection diffusion equation?
9. What are the finite volume techniques?
10. Relate finite difference method to fluid flow?

11. (a) Energy is neither created nor destroyed. Derive the basic governing equation? 16

(OR)

(b) Derive the Navier-stroke equation used for CFD calculation? 16

12. (a) Explain the need for grid generation and various grid generation methods? 16

(OR)

(b) Show the importances of grid control functions explain briefly? 16

13. (a) Classify the methods to incompressible, compressible flows? 16

(OR)

(b) Compare and contrast supersonic flow and subsonic flow? Explain supersonic flow in detail. 16

14. (a) Derive Implicit and Explicit Equation? 16

(OR)

(b) Show the Applications of CFD in aeronautical field? Explain any two in detail. 16

15. (a) Explain the difference between cell-centered and cell-vertex finite volume formulations. 16

(OR)

(b) Outline the general transport equation for obtaining convection and diffusion equation? 16