Reg. No. : | | | | | | | | | | | | |

Question Paper Code: 1014451

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV / DEC 2024
Fourth Semester
Aeronautical Engineering
U20AE401 – LOW SPEED AERODYNAMICS
(Regulation 2020)

Time: Three Hours | Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. Differentiate between compressible and incompressible flow.

2. What are the forces that can be experienced by the fluid flowing in a control volume?

3. Write about D'Alembert's Principle.

4. Provide few points on Magnus effect.

5. Mention about Joukowski transformation.

6. Write about the use of conformal transformation.

7. What is meant by a bound vortex of a wing?

8. Note few points on free vortex flow.

9. Define Displacement thickness.

10. Why we have to use critical Reynolds number?

PART – B (5 x 16 = 80 Marks)

11. (a) Derive the Euler equation with respect to a basic fluid mechanics. (16)

(OR)

(b) Derive the Combination of a Uniform Flow with a Source. (16)

12. (a) Derive the Kutta Joukowski's theorem for an incompressible flow. (16)

(OR)

(b) Explain the Kutta condition with different possible shapes of trailing edges. (16)

13. (a) Derive the Kutta Joukowski's transformation and its applications. (16)

(OR)

(b) Describe the thin airfoil theory and its applications. (16)

14. (a) Derive the Biot Savart's law for a subsonic wing theory. (16)

(OR)

(b) Discuss about the bound vortex and horse shoe vortex for a subsonic wing. (16)

15. (a) Derive the displacement thickness as the flow in laminar boundary layer. (16)

(OR)

(b) Explain the Blasius theorem as a solution for the boundary layer. (16)

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