Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ANE) (Sem.–5)

AERODYNAMICS – II

Subject Code : ANE-312

M.Code : 60521

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Explain the followings briefly:

(a) Potential flow

(b) Whitcomb's Area rule

(c) Supercritical airfoil

(d) Downwash

(e) Swept wing

(f) Helmholtz's theorem

(g) Drag Polar

(h) Supercritical aerofoil

(i) Flapped aerofoil flowfield

(j) Ground effect

SECTION-B

2. Explain briefly the significance of lift curve (C_L - α). What are the factors by which the maximum lift coefficient gets effected for a finite wing, explain.

3. Theoretical lift coefficient for a thin, symmetric airfoil in an incompressible flow is $C_l = 2\pi\alpha$. Calculate the lift coefficient for $M\infty = 0.7$. Suggest improved compressibility correction method.

4. Derive the fundamental equation of Prandtl's lifting line theory.

5. State the assumptions for thin aerofoil theory and explain important results of thin aerofoil theory for a symmetrical aerofoil.

6. Derive an expression for velocity potential equation. State the necessary assumptions.

SECTION-C

7. Draw a neat sketch of leeward vortex flow field over a delta wing and explain the spanwise pressure distribution.

8. Describe source panel method for simulating the non-lifting flow over a circular cylinder.

9. Write short notes on the following :

   (a) Blsius Theorem

   (b) Kutta Juokowaski Transformation

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.