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

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Aerospace Engg.) (2012 Onwards) (Sem.–5)

AERODYNAMICS-II

Subject Code : ASPE-303

M.Code : 71837

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION 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 following briefly :

(a) Define Biot-Savart law.

(b) Draw lift curves for symmetrical and cambered airfoil sections.

(c) What do you mean by formation flying?

(d) What do you mean by ground effects?

(e) Explain briefly transonic area rule.

(f) Define Drag divergence Mach number.

(g) Define supersonic and subsonic leading edges.

(h) Define supercritical airfoils.

(i) What do you mean by leading edge suction?

(j) What do you mean by laminar and turbulent flows?

SECTION-B

2. Explain the horse shoe vortex system.

3. What do you mean by shock-free airfoils? Explain their importance.

4. Explain Prandtl's lifting line theory and its limitations.

5. Explain slender body theory and its importance.

6. Write a note on 'Blasius Solution'.

SECTION-C

7. a) Derive Navier-Stokes equations for two-dimensional flow. (5)

   b) Explain the turbulent boundary layer properties over flat plate at low speeds. (5)

8. Write notes on the following :

   a) Prandtl - Glauert compressibility correction (5)

   b) Vortex panel method (5)

9. Define induced drag. Derive the expressions for induced angle of attack and induced drag coefficient for a wing having elliptical lift distribution. (2, 8)

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.