

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 followings briefly :**

- (a) Potential flow
- (b) Supercritical airfoil
- (c) Swept wing
- (d) Drag Polar
- (e) Flapped aerofoil flowfield
- (f) Elliptical wing
- (g) Biot-Savart's law
- (h) Induced drag
- (i) Formation flying
- (j) Ground effect

SECTION-B

2. 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.
3. State the assumptions for thin aerofoil theory and explain important results of thin aerofoil theory for a symmetrical aerofoil.
4. Show that as per Prandtl's lifting line theory the geometric angle of attack is equal to the sum of the effective angle and the induced angle of attack.
5. Explain critical Mach number and a method to determine it for an aerofoil.
6. List high lift devices and Explain the functioning of any two of these devices.

SECTION-C

7. Derive an expression for velocity potential equation. State the necessary assumptions.
8. Describe source panel method for simulating the non-lifting flow over a circular cylinder.
9. Write short notes on the followings :
 - (a) Slender body theory
 - (b) Conical flow theory

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.