Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech.(Aerospace Engg.) (2012 Onwards)   (Sem.–7,8)

AEROELASTICITY

Subject Code : ASPE-402

M.Code : 72565

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. **Write briefly :**

   (a) Aeroelasticity

   (b) Weighting matrices

   (c) Flutter

   (d) Model scale factors

   (e) Control reversal

   (f) Influence coefficients

   (g) Aileron effectiveness

   (h) Degree of freedom

   (i) Divergence

   (j) Dynamic loads

SECTION-B

2.   Explain vibration model similarity laws.

3.   Explain the phenomenon of wing torsional divergence for finite wing case.

4.   What are aeroelastic instabilities and how can these instabilities be prevented?

5.   Define Critical Flutter Speed. How is critical flutter speed determined?

6.   Explain steady state aeroelastic model testing.

SECTION-C

7.   Write notes on the following :

(a) Flight flutter testing   5

(b) Structural simulations   5

8.   Write and explain the significance of differential form of equation of motion of vibrations. Discuss the natural modes and frequencies of complex airplane structures.   3,7

9.   Write notes on the following :

(a) Identification and measurement of normal modes   5

(b) Coupling of bending and torsional oscillations   5

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.