Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3170110 Date:08/06/2022

Subject Name:Introduction to Aeroelasticity

Time:02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define Aeroelasticity.	**03**
	(b)	Discuss the solution of Aero elasticity problems.	**04**
	(c)	Write a short note on Deformation of Structures and Influence Coefficient	**07**
Q.2	**(a)**	What is swept wing?	**03**
	(b)	Discuss on Energy method.	**04**
	(c)	Explain static and dynamic aero elasticity.	**07**
		OR	
	(c)	Write a note on control effectiveness.	**07**
Q.3	**(a)**	What do you mean by structure?	**03**
	(b)	List out different types of flutter. Explain any one.	**04**
	(c)	Explain with appropriate equations and sketch “One Dimensional Aeroelastic Model of Airfoils”.	**07**
		OR	
Q.3	**(a)**	Explain physics of flow over a 2 D airfoil for supersonic flow in short.	**03**
	(b)	Discuss on “Aeroelastic Model of Straight wing”.	**04**
	(c)	Explain with appropriate equations “Divergence of 2-D airfoil”.	**07**
Q.4	**(a)**	Define flutter.	**03**
	(b)	Explain effect of flutter on 2D Airfoil.	**04**
	(c)	Explain Kernal Function Approach.	**07**
		OR	
Q.4	**(a)**	Explain physics of flow over a 3 D airfoil for supersonic flow in short.	**03**
	(b)	Explain effect of flutter on Swept wing.	**04**
	(c)	Discuss on finite state model.	**07**
Q.5	**(a)**	What is wing loading?	**03**
	(b)	Explain effect of flutter on Straight wing.	**04**
	(c)	Write a note on Theodorsen Theory.	**07**
		OR	
Q.5	**(a)**	What is aileron reversal.	**03**
	(b)	Discuss on p-k method.	**04**
	(c)	Explain U-g method.	**07**

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