Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI (NEW).EXAMINATION – WINTER 2016

Subject Code: 2160101 **Date: 22/10/2016**

Subject Name: Aerodynamics II

Time: 10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define Airfoil. And explain Airfoil nomenclature with neat sketch.	**07**
	(b)	Write a Short note on Airfoil Characteristics.	**07**
Q.2	**(a)**	Derive CAMBERED Airfoil equation for Incompressible flow over airfoils.	**07**
	(b)	Explain KELVIN Circulation theorem.	**07**
		OR	
	(b)	Explain the vortex sheet and the vortex panel numerical method for Incompressible flow over airfoils.	**07**
Q.3	**(a)**	Write a short note on Airfoil drag for viscous flow case.	**07**
	(b)	Explain KUTTA condition with neat sketch.	**07**
		OR	
Q.3	**(a)**	Write a short note on Flow Separation.	**07**
	(b)	Explain in details with procedure about transformation of circle into symmetric airfoil	**07**
Q.4	**(a)**	Explain and derive suitable mathematical equation Prandtl-Glauert compressibility correction	**07**
	(b)	At a given point on the surface of an airfoil, the pressure coefficient is -0.3 at very low speeds. If the free stream Mach Number is 0.6. Calculate Cp at this point.	**07**
		OR	
Q.4	**(a)**	Explain Super Critical Airfoil with appropriate examples.	**07**
	(b)	Derive Linearized Supersonic Pressure Coefficient formula.	**07**
Q.5	**(a)**	Explain Linearized Supersonic flow over an airfoil with neat sketch.	**07**
	(b)	Using linearized theory, Calculate the lift and drag Coefficients for a flat plate at a 5^0 A.O.A in a M=3.	**07**
		OR	
Q.5	**(a)**	Explain streamline, stream function, angular velocity, vorticity	**07**
	(b)	Define 1. Lift 2.Drag 3.Angle of Attack 4.Downwash 5.Thin airfoil 6. Pressure drag 7. Skin friction drag	**07**

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