Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI EXAMINATION – WINTER 2015

Subject Code:160101 **Date:15/12/ 2015**

Subject Name: Aerodynamics-II

Time:2:30pm to 5:00pm **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)**	State and Explain Kutta condition with the help of diagram.	**07**
	(b)	What is irrotational flow? Prove velocity potential equation with neat sketch.	**07**
Q.2	**(a)**	What is bound vortex and Horse shoe vortex? Explain with details.	**07**
	(b)	What is Airfoil? Explain Airfoil Nomenclature with a neat sketch.	**07**
		OR	
	(b)	Explain steps for exact Joukowsky transformation process and its numerical Solution.	**07**
Q.3	**(a)**	Explain application of linearized to supersonic airfoil.	**07**
	(b)	Define Lift, Drag, and Aspect ratio with equations.	**07**
		OR	
Q.3	**(a)**	Using mathematical derivation provide the solution of generalized equation for symmetric airfoil using thin airfoil theory.	**07**
	(b)	Explain and prove linearized velocity potential equation.	**07**
Q.4	**(a)**	At a given point on the surface of an airfoil, the pressure coefficient is -0.3 at very low speeds. If the freestream Mach number is 0.6, calculate C_p at this point.	**07**
	(b)	Explain with neat sketch Critical Mach number.	**07**
		OR	
Q.4	**(a)**	Write a short note on flow over an airfoil.	**07**
	(b)	Explain Biot-savart law.	**07**
Q.5	**(a)**	What is downwash? Explain with neat sketch.	**07**
	(b)	Explain in detail Prandtl's Classical Lifting line theory.	**07**
		OR	
Q.5	**(a)**	Explain compressibility effect on fuselage system.	**07**
	(b)	Explain profile theory for two dimensional flap wing.	**07**

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