Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- VIth SEMESTER–EXAMINATION – MAY- 2012

Subject code: 160101 **Date: 09/05/2012**

Subject Name: **Aerodynamics II**

Time: 10:30 am – 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)**	Explain critical Mach number, drag divergence Mach number, sound barrier, Area rule and super critical airfoil. Is there any relation among the parameters or phenomenon mention? Explain.	**07**
	(b)	Explain profile theory for two dimensional flap wing	**07**
Q.2	**(a)**	Explain compressibility effect on fuselage system	**07**
	(b)	State and Explain Kutta condition with the help of diagram. Also explain importance of Kutta condition	**07**
		OR	
	(b)	Explain low speed flow over an airfoil	**07**
Q.3	**(a)**	Using mathematical derivation provide the solution of generalized equation for symmetric airfoil using thin airfoil theory	**07**
	(b)	Explain steps for exact Joukowsky transformation process and its numerical solution	**07**
		OR	
Q.3	**(a)**	Explain in details with procedure about transformation of circle into symmetric airfoil	**07**
	(b)	Write notes on bound vortex, Horse shoe vortex system	**07**
Q.4	**(a)**	Explain Biot-Savart Law for vortex and Derive equation for infinite wing	**07**
	(b)	State Helmholtz's laws for vortex. Also explain how this laws are useful in finite wing theory?	**07**
		OR	
Q.4	**(a)**	Write note on finite airfoil theory	**07**
	(b)	Explain and derive suitable mathematical equation for minimum drag load distribution on a given wing.	**07**
Q.5	**(a)**	Explain application of linearized to supersonic airfoil	**07**
	(b)	Write note on aerodynamics of fuselage system	**07**
		OR	
Q.5	**(a)**	Write notes on aerodynamics of airfoil, infinite wing and finite wing	**07**
	(b)	Write note on viscous flow past an airfoil	**07**

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