Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2018

Subject Code:2160101 **Date:16/11/2018**

Subject Name:Aerodynamics II

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.**

Q.1*	(a)	What is the difference between Subsonic and Supersonic flow?	03
	(b)	Explain Kelvin's theorem.	04
	(c)	Explain with neat sketch Airfoil Nomenclature.	07
Q.2	(a)	What is the effect of an airfoil thickness on critical mach number?	03
	(b)	Define Compressible and Incompressible flow.	04
	(c)	Derive Linearized velocity potential equations.	07
		OR	
	(c)	Write a short note on Biot-Savart Law for vortex.	07
Q.3	(a)	Define Circulation with sketch.	03
	(b)	Explain Stream function.	04
	(c)	What is supersonic area rule? Explain in details.	07
		OR	
Q.3	(a)	Define Lift and Drag with equations.	03
	(b)	Explain flow over a Flat plate with neat sketch.	04
	(c)	Write a short note on Helmholtz's theorem.	07
Q.4	(a)	What is critical Mach number?	03
	(b)	What is compressibility effect?	04
	(c)	Explain Classical thin airfoil theory for symmetric airfoil.	07
		OR	
Q.4	(a)	Write an equation for Linearized supersonic theory, the lift and wave-drag coefficients for a flat plate at an angle of attack.	03
	(b)	Draw variation of the Linearized pressure co-efficient with Mach number	04
	(c)	Derive Linearized supersonic pressure co-efficient formula with neat sketch.	07
Q.5	(a)	Explain Drag divergence mach number.	03
	(b)	Draw an Effect of airfoil thickness on critical Mach number. (Draw only figure)	04
	(c)	Explain in details with procedure about transformation of circle into symmetric airfoil	07
		OR	
Q.5	(a)	What do you mean by linear theory?	03
	(b)	What do you mean by Supersonic flow? List out characteristics of supersonic flow.	04
	(c)	Explain Prandtl Glauert Compressibility corrections.	07

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