Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160113 Date:28-05-2025

Subject Name: Advance Aerodynamics

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define Supersonic flow and Hypersonic flow.	**03**
	(b)	Explain importance of Temperature property in hypersonic flow.	**04**
	(c)	Explain with neat sketch thin shock layer and entropy layer.	**07**
Q.2	**(a)**	Importance and criteria of Compressible flow in Aerodynamics field.	**03**
	(b)	Define Subsonic flow.	**04**
	(c)	Explain the concept of Supersonic airfoil drag.	**07**
		OR	
	(c)	Derive the equation of linearized supersonic flow over an airfoil.	**07**
Q.3	**(a)**	What do you mean by supersonic airfoil drag?	**03**
	(b)	Define Tangent cone method.	**04**
	(c)	Explain Rayleigh flow with sketch.	**07**
		OR	
Q.3	**(a)**	What is wave rider?	**03**
	(b)	What is drag divergence mach number?	**04**
	(c)	Derive the linearized supersonic pressure coefficient formula with appropriate sketch.	**07**
Q.4	**(a)**	Define Drag divergence mach number.	**03**
	(b)	Write a note on "Prandtl-Glauert Compressibility correction".	**04**
	(c)	Derive velocity potential equation with sketch.	**07**
		OR	
Q.4	**(a)**	Define Area rule.	**03**
	(b)	Explain in short Sound Barrier.	**04**
	(c)	Write a note on Fanno flow.	**07**
Q.5	**(a)**	Define Aerothermodynamics.	**03**
	(b)	Write a note on shock expansion theory.	**04**
	(c)	Derive an equation on "Hypersonic shock relation in terms of hypersonic similarity parameters".	**07**
		OR	
Q.5	**(a)**	Define Mach number and Shockwave.	**03**
	(b)	Explain viscous retraction with sketch.	**04**
	(c)	Write a note on Recapitulation with neat sketch.	**07**

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