Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER–VIII • EXAMINATION – SUMMER • 2014

Subject Code: 180105 **Date: 27-05-2014**

Subject Name: High Speed Aerodynamics and Experimental Techniques

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)**	To explain $\theta - \beta - M$ diagram and prove $\beta = 1.20$ for hypersonic flow.	**07**
	(b)	Explain conical flow method treatment for Rectangular wings.	**07**
Q.2	**(a)**	Explain Entropy Layer and Viscous Interaction with neat sketch.	**07**
	(b)	Explain Hypersonic shock relations in terms of the hypersonic similarity parameter,	**07**
		OR	
	(b)	What is aerodynamic heating? Explain in details.	**07**
Q.3	**(a)**	Write a short note on Centrifugal force corrections to Newtonian theory with neat sketch.	**07**
	(b)	What is wind tunnel? Explain construction of subsonic open wind tunnel.	**07**
		OR	
Q.3	**(a)**	Explain wind tunnel corrections and solid blockage with figure.	**07**
	(b)	Write a short note on TANGENT-CONE METHODS for hypersonic flow.	**07**
Q.4	**(a)**	Explain with neat sketch shock expansion methods for hypersonic flow.	**07**
	(b)	What is supersonic wind tunnel? Explain Flow Visualization Techniques.	**07**
		OR	
Q.4	**(a)**	Write a short note on NEWTONIAN THEORY.	**07**
	(b)	Write a short note on LIFT EFFECT in wind tunnels.	**07**
Q.5	**(a)**	Describe aerodynamic design consideration for the super-sonic aircraft.	**07**
	(b)	Explain with neat sketch Delta & Arrow Wings.	**07**
		OR	
Q.5	**(a)**	Explain with neat sketch Swept Wings.	**07**
	(b)	Write a short note on Wave riders for hypersonic flow.	**07**

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