

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– VIIIth• EXAMINATION – SUMMER 2016****Subject Code: 180105****Date: 16/05/2016****Subject Name: High Speed Aerodynamics and Experimental Techniques****Time:10:30 AM to 01:30 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) Write a short note on Delta wing with neat sketch. **07**
 (b) Define Supersonic and Hypersonic flow. Draw and explain entropy layer for airfoil in hypersonic flow. **07**
- Q.2** (a) What is Newtonian theory? Derive $\beta = \theta$ for hypersonic flow. **07**
 (b) Derive modified Newtonian equation for hypersonic flow. **07**
OR
 (b) Explain with neat sketch swept wing. **07**
- Q.3** (a) At $M=5$, Deflection angle = 42° , $\gamma = 1.4$, **07**
 To find out pressure co-efficient for hypersonic flow using basic hypersonic shock relations.
 (b) Explain Wind tunnel Balances and Wind tunnel Corrections. **07**
OR
- Q.3** (a) Explain Solid Blockage and Wake Blockage. **07**
 (b) Write a Short note on Lift Effect for Experimental method in Aerodynamics. **07**
- Q.4** (a) What is wind tunnel? Explain construction of subsonic open type wind tunnel with neat sketch. **07**
 (b) Explain tangent cone method with neat sketch. **07**
OR
- Q.4** (a) Explain With neat Sketch Centrifugal force corrections to Newtonian theory. **07**
 (b) Write a short note on Shock expansion method for local surface inclination method. **07**
- Q.5** (a) For $M=5$, $\beta=3^\circ$, Using Oblique shock wave geometry, find out T_2/T_1 for Hypersonic flow. **07**
 (b) Explain Low Density flow for Hypersonic case. **07**
OR
- Q.5** (a) Explain Viscous Interaction for Hypersonic flow. **07**
 (b) Explain with neat sketch Centered Expansion Eave for Hypersonic Flow. **07**
