

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VI • EXAMINATION – WINTER • 2014

Subject Code: 180105**Date: 25-11-2014****Subject Name: High Speed Aerodynamics & Experimental Techniques****Time: 02:30 pm - 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) Explain low density flows associated with hypersonic flow. 07
(b) Explain Shock expansion technique for curved surfaces. 07
- Q.2 (a) Apply centrifugal force correction to Newtonian flow theory. 07
(b) What are the design considerations for supersonic aircraft? 07
- OR**
- (b) How boundary layer investigation is carried out experimentally? 07
- Q.3 (a) What is wind tunnel? Explain construction of subsonic open wind tunnel. 07
(b) Explain with neat sketch Flow Visualization technique. 07
- OR**
- Q.3 (a) Write a short note on Aerodynamic Interaction for supersonic flow over the wings. 07
(b) Write a short note on $\theta - \beta - M$ diagram with neat sketch. 07
- Q.4 (a) Explain with figure Supersonic flow and Hyper sonic flow for Airfoil. 07
(b) Write a short note on wave rider 07
- OR**
- Q.4 (a) What is consequence of linearity? Explain solution by it in detail 07
(b) Explain High temperature profile for hypersonic flow 07
- Q.5 (a) Explain Aerodynamics characteristics for Hypersonic flow. 07
(b) Explain flow over the flat plate for hypersonic flow. 07
- OR**
- Q.5 (a) Explain Lift Effect in wind tunnels. 07
(b) Explain Modified Newtonian law. 07
