Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY M. E. - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: 731103 Date: 26/12/2012 Subject Name: Automotive Aerodynamics & Safety Time: 10.30 am - 01.00 pm**Total Marks: 70 Instructions:** 1. Attempt all questions. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. **07** Q.1 (a) Explain in detail the aerodynamic consideration in body profiling. Explain the concept of bluff body. 07 **(b)** Write short note on drag co-efficient of cars. 07 **Q.2** (a) Write short note on dust flow patterns at the rear 07 **(b)** Explain Air resistance opposing the motion of a vehicle. 07 Q.3(a) Discuss in detail on car body drag reduction. 07 Explain deformation behavior of vehicle body. 07 **(b)** OR **Q.3** Write short note on speed control devices 07 (a) Define: (i)Square back drag (ii) Fast back drag (iii) Hatch back drag **07 (b)** (iv) Notch back drag (a) Describe in detail various considerations that should be kept in mind when designing **Q.4 07** a passenger vehicle for safety (b) Explain briefly Automobile seat belts. 07 OR Discuss different types of Air Bag system with neat sketch. (a) 07 0.4 Differentiate between active safety and passive safety. **(b)** 07 0.5 **07** (a) Explain anti-skid braking system Write short note on rear vehicle object detection system. 07 0.5 Write short note on Tiltable steering wheel 07 (a) What are the functional requirements of central door locking? What are the door lock **(b)**

actuators? Draw a central door circuit along with remote operation.