

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

# GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. SEMESTER III-EXAMINATION – WINTER 2015

**Subject code: 2731104**

**Date: 04/12/2015**

**Subject Name: AUTOMOTIVE AERODYNAMIC & SAFETY**

**Time: 2:30 PM to 5:00 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 the concept of Bluff Body. **07**  
(b) Define: (1) Square back drag. **07**  
(2) Notch back drag.  
(3) Fast back drag.  
(4) Hatch back drag.
- Q.2** (a) Explain bumper design for vehicle safety. **07**  
(b) Explain wake effect and dust flow pattern at the rear side of the vehicle. **07**
- OR**
- (b) Write short note on concept of vehicle safety. **07**
- Q.3** (a) What is obstacle avoidance radar? Explain its principle of operation with the help of a simple line diagram. **07**  
(b) What are automatic seat belts? Why seat belt required in car? **07**
- OR**
- Q.3** (a) Explain deformable behavior of vehicle body. **07**  
(b) Explain electronic system for activating air bags. **07**
- Q.4** (a) Describe the construction and working of an Antilock brake system. **07**  
(b) Explain Air resistance opposing the motion of a vehicle. **07**
- OR**
- Q.4** (a) Explain in detail the Aerodynamic consideration in body profiling of vehicle. **07**  
(b) Write short note on Tilttable steering wheel. **07**
- Q.5** (a) What are the modern safety features use in advance vehicle? **07**  
(b) What are the functional requirement of central door locking? What are the door lock actuators? **07**
- OR**
- Q.5** (a) How speed control is possible in various Automotive vehicle? **07**  
(b) Discuss in detail on car body drag reduction. **07**

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