

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME Semester –III Examination Dec. - 2011**

**Subject code: 731103****Date: 08/12/2011****Subject Name: Automotive Aerodynamics & Safety****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) What are the safety considerations while designing the automobile body? Explain it. **07**  
(b) Write short note on an aerodynamic shape analysis. **07**
- Q.2** (a) Write short note on drag co-efficient of cars. **07**  
(b) Explain the concept of bluff body. **07**
- OR**
- (b) Write short note on dust flow patterns at the rear. **07**
- Q.3** (a) Discuss in detail on car body drag reduction. **07**  
(b) Define: (i) Square back drag (ii) Fast back drag (iii) Hatch back drag **07**  
(iv) Notch back drag
- OR**
- Q.3** (a) Explain Air resistance opposing the motion of a vehicle. **07**  
(b) Explain deformation behavior of vehicle body. **07**
- Q.4** (a) Explain need for Automobile Safety. **07**  
(b) Explain Bumper design for safety. **07**
- OR**
- Q.4** (a) Name the main components in a typical Air Bag system with neat sketch. **07**  
(b) Differentiate between active safety and passive safety. **07**
- Q.5** (a) Explain how Air Bags are useful in interior safety of automobile. **07**  
(b) Write short note on rear vehicle object detection system. **07**
- OR**
- Q.5** (a) What are the functional requirements of central door locking? What are the door lock actuators? Draw a central door circuit along with remote operation. **07**  
(b) Describe the construction and working of an antilock brake system. **07**

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