

Manipal Institute of Technology, Manipal

Constituent Institute of Manipal University)



(03)

## VII SEMESTER B.TECH (AUTOMOBILE ENGINEERING) END SEMESTER EXAMINATIONS, DEC 2015/JAN 2016

SUBJECT: VEHICLE BODY ENGINEERING AND AERODYNAMICS

## [AAE 451]

## **REVISED CREDIT SYSTEM**

Time: 3 Hours

MAX. MARKS: 50

## Instructions to Candidates:

- Answer **ANY FIVE FULL** the questions.
- ✤ Plot the graphs and draw the sketches wherever it is applicable
- **1A.** How the internal flow is varied with pitot tube? Explain.
- **1B.** Discuss the behavior of flow separation and flow attachment over the vehicle **(04)** body.
- 1C. Explain the concept of drag variation with reference to two slender bodies. (03)
- 2A. What is meant by tangential force and explain why it generates? (02)
- **2B.** What is the difference between friction drag and pressure drag? **(03)**
- **2C.** Sketch and explain the external flow and pressure distribution over the **(05)** vehicle body.
- **3A.** What modifications can be made in plan view and side panels to improve the **(03)** flow?
- **3B.** Discuss the effect of rear end geometry parameters and its flow separation **(03)** on notch back.
- **3C.** Explain the physical mechanisms involved that are responsible for generating **(04)** drag.

4A.	Explain the concept of boat tailing with variation in length.	(03)
4B.	Write a note on pressure distribution on a slanted rear of fast back.	(03)
4C.	Discuss the effect of drag on non-streamlined wheel.	(04)

5A.	Sketch and explain Gottiengen and Eiffile type wind tunnel	(05	5)
5B.	Sketch and explain frontal area measuring technique.	(03	3)
5C.	Contrast the differences between static and dynamic loading.	(02	2)

6A.	Sketch and explain three types of test section used in wind tunnel.	(03)
6B.	Sketch and explain the Laser Doppler effect used in wind tunnel.	(04)
6C.	Discuss aerodynamic stability in crosswinds with a diagram and also state which one them is more stable.	(03)