Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(AE) (2011 Onwards) (Sem.–6)

AUTOMOTIVE AERODYNAMICS

Subject Code : BTAE-604

Paper ID : [A2383]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION A

1. Write briefly :

(a) Give the meaning of the terms acceleration & gradiability.

(b) List four aerodynamic variables & state their effect.

(c) Draw a sketch for four door sedan body & label it.

(d) What is the effect of fasteners in relation to shape optimization of cars?

(e) What is compression ratio and brake thermal efficiency with regards to IC engines?

(f) State transducer.

(g) Explain in brief stress with scale models.

(h) Explain in brief drag reduction in commercial vehicles.

(i) What is meant by drag force?

(j) Describe two practical objective of aerodynamics.

SECTION B

2. How does roof, windshield wiper effect the flow field in aerodynamics?

3. Describe in brief strategies for aerodynamic development.

4. Explain briefly how shape optimization of cars can be done.

5. Describe in brief dust flow patterns at the rear end of the cars.

6. Discuss in detail effect of fasteners with regards to shape optimization of cars.

SECTION C

7. Discuss in detail front and rear wind shield angle, Boat tailing and Hatch back.

8. Write short notes on :

   (a) Lateral stability problems

   (b) Road testing methods

   (c) Potential of vehicle aerodynamics

9. What are the various characteristics of forces and moments? Also explain the drag reduction in commercial vehicles.