Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

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B.Tech.(AE) (2012 to 2017) (Sem.–6)

AUTOMOTIVE AERODYNAMICS

Subject Code : BTAE-604

M.Code : 71220

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 have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

(a) What do you mean by coefficient of drag for cars?

(b) What are the different ways to cool the engine?

(c) What is the main comfort feature of the air supplied to the passenger compartment?

(d) What is the main condition for low drag profile?

(e) What do you mean by fast back?

(f) What is the range for rear wind shield angle?

(g) What do you mean by prototype?

(h) What do you mean by scaled models?

(i) Write the relation between top speed, aerodynamic drag and engine power output of a vehicle.

(j) State any one way to reduce the drag force in vehicles.

SECTION-B

2. Explain the developments in the shape of cars starting from car from Camille Jenatzy in 1899 to the shapes of modern cars. Describe the features in terms of fuel efficiency, speed, luxuries etc.

3. What are the different strategies for aerodynamic development? Explain.

4. Discuss the concept of hatch back, fast back and square back for shape optimization of cars.

5. Draw a neat sketch of a wind tunnel and explain the functions of various parts.

6. Explain dirt accumulation on the vehicle.

SECTION-C

7. With the help of suitable diagrams and examples, describe external flow and internal flow for a body. Apply Bernoulli's equation to find pressure coefficient in terms of velocity and. plot Cp *vs* x/1 for a vehicle shaped body on upper and lower side.

8. Discuss the effects of forces and moments on the vehicle and how these are calculated.

9. With the help of suitable example, explain the stress calculation for a full-scale wind tunnel model. Also mention the equipment's and transducers used for the same.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.