

Roll No.

Total No. of Pages : 02

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B.Tech.(AE) (2011 Onwards) (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 laminar flow?
- (b) What do you mean by wake region?
- (c) What are different modes to cool the engine?
- (d) Does the shape of a vehicle affect the efficiency?
- (e) What is the use of fasteners?
- (f) What is the range for rear wind shield angle?
- (g) Write the ways used to eliminate or reduce the vehicle wind noise.
- (h) Draw the stability diagram showing all the moments of the vehicle taking a turn on a banking curved road. Also consider the side wind effect.
- (i) What is the main limitation of simulation?
- (j) What do you mean by scaled models?

SECTION-B

2. Describe the process of cooling of transverse and rear engine.
3. Explain the car as a bluff body also discuss the different types of drag forces on it.
4. Explain the effect of dirt accumulation on the vehicle.
5. Write a short on Fast Back and Square Back.
6. Explain the different measurement techniques used in wind tunnel and also describe the equipments used for it.

SECTION-C

7. With the help of a suitable example, explain the stress calculation for a full-scale wind tunnel model. Also mention the equipments and transducers used for the same.
8. Explain with a neat sketch, how front-end modification helps the vehicle to reduce the drag. Also explain the dust flow pattern at the rear of a vehicle.
9. Explain the following terms in detail :
 - a) Bluff body
 - b) Low drag profile
 - c) Drag coefficient

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.