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Total Number of Pages : 01

B.Tech.
PEAT5404

8th Semester Regular Examination 2017-18
AUTOMOTIVE AERODYNAMICS

BRANCH : AUTO

Time : 3 Hours

Max Marks : 70

Q.CODE : C244

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

- Q1. Answer the following questions :** (2 x 10)
- a) Why aerodynamics body shapes are required for automobile?
 - b) What is a bluff body?
 - c) Show low drag profiles.
 - d) Why hatch back design is preferred in passenger cars?
 - e) How front and rear wind shield angle affects aerodynamics of cars?
 - f) Why wind tunnels are used?
 - g) What are scaled models?
 - h) What are the advantages of numerical methods used for aerodynamics simulation?
 - i) What are the types of wind tunnel used in aerodynamics study?
 - j) Why spoilers are used in cars?
- Q2.**
- a) Name different types of drag force acting on automobile. (2)
 - b) Explain the effects of vehicle aerodynamics on resistance to vehicle motion, fuel consumption and performance. (8)
- Q3.**
- a) Explain analysis procedures of aerodynamic drag and how drag coefficient of cars are calculated? (5)
 - b) Write about strategies for aerodynamic development. (5)
- Q4.**
- a) Explain the origin of forces and moments on a vehicle and their effects on it. (5)
 - b) Differentiate between hatch back, fast back and square back. (5)
- Q5.**
- a) Write about drag reduction in commercial vehicles. (5)
 - b) Explain different measurement techniques used for aerodynamics test. (5)
- Q6.**
- a) Write about CFD analysis and how its help in aerodynamics study. (5)
 - b) Write limitation of simulation techniques used in aerodynamics. (5)
- Q7.** Explain with neat sketch the construction and working principle of wind tunnel. (10)
- Q8. Write short answer on any TWO :** (5 x 2)
- a) Flow field around car
 - b) Scale model testing
 - c) Flow visualization techniques
 - d) Road testing methods