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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Seventh Semester, B.E. - Automobile Engineering

Semester End Examination; Dec - 2016/Jan - 2017

Aerodynamics and Vehicle Body Engineering

Time: 3 hrs

Max. Marks: 100

Note: Answer *FIVE* full questions, selecting *ONE* full question from each unit.

UNIT - I

- 1a. Explain with suitable sketches different styling forms of passenger cars. 10
- b. How do you classify the coach and bus body styles and explain with suitable sketches. 10
- 2 a. How do you classify the commercial vehicle? Explain briefly. 4
- b. With suitable diagram, explain the concept of visibility of a driver for both front and rear. 12
- c. Explain briefly the painting process of passenger car. 4

UNIT - II

- 3 a. What are the different types of materials used for vehicle body construction? Explain few briefly. 10
- b. Explain the different types of Glasses used in vehicle body construction. 6
- c. Write a short note on insulating materials. 4
- 4 a. Mention the important power tools for body work. 4
- b. Explain briefly the corrosion prevention technique and material. 6
- c. What are the different types of plastics used in body construction? Explain the specifications and properties. 10

UNIT - III

- 5 a. With suitable diagram, explain the aerodynamic forces moments acting on a car body. 10
- b. Explain the following : 10
- i) Aerodynamic drag ii) Aerodynamic lift.
- 6 a. With neat sketch, explain the wind tunnel test to determine the coefficient of drag for a vehicle. 10
- b. With suitable diagram explain the stream lines around a car body. 4
- c. Explain the location of air intakes and outlets. 6

UNIT - IV

- 7 a. List the safety precautions should be considered for driver and passenger and explain with suitable sketches any two of them. 10
- b. Discuss the complete design consideration for driver seat design of car. Explain with suitable sketch. 10

8. Explain the following:
- | | | |
|----------------------|------------------------------------|----|
| i) Air bags | ii) Collapsible steering column | 20 |
| iii) Engine location | iv) Design of the body for safety. | |

UNIT - V

- 9 a. Describe with suitable diagram the load distribution for the bus. 12
- b. Explain with suitable sketch ;
- | | |
|----------------------|---|
| i) Asymmetric loads | 8 |
| ii) Symmetric loads. | |
- 10 a. What is the active and passive safety features provided in a car? Explain briefly. 12
- b. Discuss the design consideration for crash worthiness. 8

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