



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

(An Autonomous Institution affiliated to VTU, Belagavi)

Seventh Semester, B.E. - Automobile Engineering

Semester End Examination; Jan. / Feb. - 2021

Vehicle Body Engineering and Safety

Time: 3 hrs

Max. Marks: 100

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

ii) Assume suitably missing data if any.

UNIT - I

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| 1 a. | Explain the different seating layouts of buses with neat sketches. | 10 |
| | b. Sketch and explain the concept of visibility of a driver for both front and rear. | 10 |
| 2 a. | Discuss in detail the special features of different types of car bodies. Explain them briefly. | 10 |
| | b. List the different methods of construction of vehicle body and explain them briefly. | 10 |

UNIT - II

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| 3 a. | Discuss the stability of Aluminum and its alloys for vehicle body construction highlighting their properties. | 10 |
| | b. Explain the types of glasses with their properties for vehicle body construction. | 10 |
| 4 a. | Explain the body trim items and body mechanics. | 10 |
| | b. Discuss the classification of materials for the purpose of vehicle body construction. | 10 |

UNIT - III

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| 5 a. | With neat sketches, explain the aerodynamic forces and moments acting on a car body. Discuss their effects. | 10 |
| | b. Discuss the optimization techniques to minimize the drag. | 10 |
| 6 a. | With neat sketch, explain the wind tunnel test to determine the coefficient of drag for a vehicle. | 10 |
| | b. Illustrate the flow visualization techniques with examples. | 10 |

UNIT - IV

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| 7 a. | Explain the complete design consideration for a driver seat of a car, with neat sketch. | 10 |
| | b. List the safety precautions considered for driver and passenger. Explain with suitable diagram. | 10 |
| 8 a. | Explain the following: | 10 |
| | i) Sand-Wich construction ii) Deformation behavior of vehicle body | |
| | b. Explain the speed and acceleration characteristics of passenger compartment on impact. | 10 |

UNIT - V

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| 9 a. | Explain; i) Symmetric loads and ii) Asymmetric loads. | 8 |
| | b. With a neat sketch, explain the load distribution in case of bus. | 12 |
| 10 a. | Discuss the design consideration for crash worthiness. | 10 |
| | b. Discuss the safety types in detail. | 10 |