



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; February - 2022
Vehicle Body Engineering and Safety

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Explain the various constructional styles and shapes with respect to visibility, safety and interiors of car and bus bodies.

CO2: Analyze the appropriate materials for body construction in view of safety, durability and aesthetics.

CO3: Analyze the Aerodynamics profile of automobile body for optimum performance.

CO4: Discuss the various requirements of automobile safety for passenger vehicles.

CO5: Discuss the stress induced in vehicles for different load conditions the crash worthiness of vehicles.

Note: I) PART - A is compulsory. **Two** marks for each question.

II) PART - B: Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
I : PART - A		10			
I a.	List out the styling forms of car bodies.	2	L1	CO1	PO1
b.	List the types of materials used for vehicle body.	2	L1	CO2	PO1
c.	List the types of loading cases.	2	L1	CO3	PO1
d.	What are types of active safety?	2	L1	CO4	PO1
e.	What are the types of load carrying structure?	2	L1	CO5	PO1
II : PART - B		90			
UNIT - I		18			
1 a.	With a neat sketch, explain the constructional details of a car body.	9	L2	CO1	PO1
b.	Discuss the types of visibility with neat sketches.	9	L3	CO1	PO2
c.	Discuss the classification of buses based on the distance with sketches.	9	L2	CO1	PO1
UNIT - II		18			
2 a.	Explain role of steel in construction of vehicle body.	9	L2	CO2	PO2
b.	Discuss the classification of plastics in detail.	9	L2	CO2	PO2
c.	Explain;				
	i) Anticorrosion methods	9	L2	CO2	PO2
	ii) Modern painting process				
UNIT - III		18			
3 a.	Explain the types of aerodynamic drag.	9	L3	CO3	PO1
b.	With a neat sketch, explain the effects of forces and moments.	9	L2	CO3	PO2
c.	Sketch and explain the wind tunnel technology.	9	L2	CO3	PO2

UNIT - IV**18**

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|------|---|---|----|-----|-----|
| 4 a. | Discuss the design parameters for safety. | 9 | L2 | CO4 | PO2 |
| b. | Explain the location of engine related to safety in detail. | 9 | L2 | CO4 | PO1 |
| c. | Explain the speed and acceleration characteristics. | 9 | L2 | CO4 | PO1 |

UNIT - V**18**

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| 5 a. | Explain with neat sketches; | | | | |
| | i) Symmetric loads | 9 | L2 | CO5 | PO2 |
| | ii) Static load | | | | |
| b. | Discuss the load distribution for normal passenger car. | 9 | L3 | CO5 | PO2 |
| c. | Discuss the design consideration for crash worthiness. | 9 | L3 | CO5 | PO2 |

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