



B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Sixth Semester

AUTOMOBILE ENGINEERING

U18AUT6003: Vehicle Body Engineering

COURSE OUTCOMES

- CO1:** Classify the vehicles and define basic terminologies.
CO2: Select appropriate body material for automobiles.
CO3: Calculate various aerodynamic forces and moments acting on vehicle.
CO4: Examine the various loads distribution in vehicle frames.
CO5: Familiarize the ergonomics concepts related to the vehicles.
CO6: Apply various safety aspects as per the norms.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

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| 1. Recall the meaning of BIW (Body in White) | CO1 | [K ₁] |
| 2. Explain the significance of seat dimensions in vehicle design. | CO1 | [K ₂] |
| 3. Define aerodynamic drag and lift | CO2 | [K ₁] |
| 4. Explain the concept of wind tunnel testing in vehicle aerodynamics | CO2 | [K ₂] |
| 5. List the classifications of car body types. | CO3 | [K ₁] |
| 6. Summarize the purpose of remote and central locking systems in cars. | CO3 | [K ₂] |
| 7. Define articulated bus and its key feature. | CO4 | [K ₁] |
| 8. Identify the purpose of pneumatic equipment in passenger doors of buses. | CO4 | [K ₂] |
| 9. List the types of commercial vehicle bodies | CO5 | [K ₁] |
| 10. Explain the importance of payload regulations in commercial vehicles. | CO6 | [K ₂] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

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| 11. a) Analyze the modern construction techniques used in vehicle bodies to enhance crashworthiness. | 8 | CO1 | [K ₄] |
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| | b) | Propose methods to improve driver visibility in vehicle design and evaluate their effectiveness. | 8 | CO1 | [K5] |
| 12. | a) | Analyze the forces and moments acting on a vehicle body during motion and their effects on vehicle stability. | 8 | CO2 | [K4] |
| | b) | Propose techniques for optimizing vehicle body design to minimize drag and lift, and evaluate their effectiveness. | 8 | CO2 | [K5] |
| 13. | a) | Compare the structural differences between a Hatchback and an SUV, and explain their impact on functionality. | 8 | CO3 | [K4] |
| | b) | Evaluate the safety features integrated into modern car body panels, doors, and windows, and suggest improvements. | 8 | CO3 | [K5] |
| 14. | a) | Compare conventional and integral coach-type construction in buses and evaluate their advantages.. | 8 | CO4 | [K4] |
| | b) | Discuss the factors affecting bus body layout, including seating arrangements, engine location, and floor height, and suggest how these elements influence overall design. | 8 | CO4 | [K5] |
| 15. | a) | Compare the designs of a flat platform body and a tipper body in commercial vehicles, and evaluate their suitability for different purposes. | 8 | CO5 | [K4] |
| | b) | Discuss the design considerations for the driver's cab in light commercial vehicles, including seat dimensions and control layout, and suggest improvements for ergonomic safety. | 8 | CO5 | [K5] |
| 16. | a) | Compare the properties of steel and GRP in vehicle body construction, and evaluate their suitability for modern vehicles. | 8 | CO6 | [K4] |
| | b) | Discuss the modern painting process for vehicles, including anti-corrosion methods, and suggest improvements for dealing with common paint problems. | 8 | CO6 | [K5] |
