



B.E/B.TECH DEGREE EXAMINATIONS: APRIL / MAY 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)

- | | |
|--|-----------------------|
| 1. List down the types of Tanker Truck Bodies. | CO1 [K ₁] |
| 2. Examine the thickness of Heavy Duty Vehicle's Window. | CO6 [K ₁] |
| 3. Distinguish Fibre Reinforced & Glass Reinforced Polymer. | CO2 [K ₂] |
| 4. Inspect the mechanism involved in an adjustable steering column | CO1 [K ₂] |
| 5. List out the aerodynamic forces acting on a moving vehicle. | CO3 [K ₂] |
| 6. Sketch the bus step with appropriate dimensions recommended to the bus body regulations. | CO5 [K ₂] |
| 7. Describe Pitching, Rolling and Yawing for a passenger car. | CO3 [K ₂] |
| 8. Review the role of crumple zones in a car. | CO4 [K ₂] |
| 9. Suggest methods to enhance the visibility in a vehicle. | CO5 [K ₂] |
| 10. Illustrate the various elements of a Body-In-White Structures that provide access to the engine compartment. | CO1 [K ₃] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

- | | | |
|---|------|-----------------------|
| 11. a) Draw a neat sketch of a car and Identify the car body parts. | (6) | CO1 [K ₂] |
| b) Classify the types of cars & Explain each with a neat sketch. | (10) | CO1 [K ₂] |
| 12. Explain Chassis type and Monocoque bus body construction method with neat sketches. | (16) | CO4 [K ₂] |

13. a) Write a note on types of corrosion in automobiles. (8) CO2 [K₂]
b) Discuss the following methods of anticorrosion. (8) CO2 [K₂]
 i. Active Corrosion Protection
 ii. Passive Corrosion Protection
 iii. Permanent Corrosion Protection
 iv. Temporary Corrosion Protection
14. a) Describe the types and function of wind tunnel. Explain the flow visualization techniques used for automotive wind tunnel testing. (10) CO3 [K₂]
b) Relate the appropriate values of Coefficient of Drag to different shapes available. (6) CO3 [K₂]
15. a) Reconstruct a One-Way tipper truck into a Three-Way tipper truck and Explain its operation and mechanism with neat sketches. (10) CO5 [K₃]
b) Explain the properties and applications of various materials that are being commonly used in the construction of vehicle bodies. (6) CO2 [K₂]
16. a) Explain Driver Visibility. (4) CO6 [K₁]
b) Explain the various test procedures adopted to measure the visibility index of a vehicle. (12) CO6 [K₂]
