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**BTECH**  
**(SEM VII) THEORY EXAMINATION 2023-24**  
**VEHICLE BODY ENGINEERING & SAFETY**

TIME: 3 HRS

M.MARKS: 100

Notes: 1. Attempt all sections. if require any missing data; then choose suitably.

**SECTION A**

1. Attempt all questions in brief.

Q no.	Question	Marks	CO
a.	Describe the "importance of vehicle body design".	2	1
b.	List down the % composition of carbon in low c steel, medium c steel, high c steel.	2	1
c.	Define "Ground clearance".	2	2
d.	Write the advantages of front engine front wheel drive over rear engine rear wheel drive.	2	2
e.	State the resistances faced by the moving vehicle.	2	3
f.	Define metal matrix composites. Give two examples.	2	3
g.	Discuss the importance of downward visibility?	2	4
h.	Define ergonomics in reference to vehicle body.	2	4
i.	Explain the term "crash worthiness".	2	5
j.	Write the names of stationary and mobile sources of noise.	2	5

**SECTION B**

2. Attempt any three of the following:

a.	Categorize the auto/vehicle bodies parts in terms of their application and Shape.	10	1
b.	Define corrosion. What are the techniques adopted to prevent corrosion of a vehicle body? Briefly explain them.	10	2
c.	With a neat sketch discuss various forces and moments acting on a vehicle.	10	3
d.	List out the points to be considered while designing a driver's seat.	10	4
e.	Write short notes on following i) Anti Corrosion Material ii) Ergonomics iii) Corrosion iv) methods of noise suppression in vehicle body system.	10	5

**SECTION C**

3. Attempt any one part of the following:

a.	Explain the classification of passenger cars and bus bodies with sketches.	10	1
b.	Explain the following terms in detail along with neat sketch. a) Angle of Approach b) Angle of Departure c) Ground Clearance	10	1

4. Attempt any one part of the following:

a.	Explain the properties and usage of various body materials used in automobile.	10	2
b.	Write short notes on following. i) Paint ii) Glass Reinforced Plastic (GRP) iii) Composite	10	2

5. Attempt any one part of the following:

a.	List out the different types of body optimization techniques for minimum drag in the vehicle. Explain in detail with different configurations with coefficient of drag.	10	3
b.	Explain the wind tunnel concept in vehicle body design consideration. How flow visualization technique related to this?	10	3

6. Attempt any one part of the following:

a.	Discuss various factors to be considered for a driver seating position.	10	4
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b.	Explain the techniques used to reduce the impact of the steering wheel to the driver of a passenger car in the event of collision?	10	4
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7. Attempt any *one* part of the following:

a.	Define noise. Explain the classification of noise. What are the noise level measurement techniques?	10	5
b.	Explain the force in the mechanics of deformable bodies. Why is the analysis of deformable bodies quite complicated?	10	5

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