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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2025 - 2026)

Subject: Vehicle Body Engineering

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.
2. Maximum marks for each question are indicated on right -hand side of each question.
3. Illustrate your answers with neat sketches wherever necessary.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.
6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

- (1.1) The component that connects the steering rack to the knuckles is (CO1, K1) 1
- (a) Tierod
 - (b) Sektorgear
 - (c) Pivot
 - (d) Spline
- (1.2) In petrol engines, during suction stroke, _____ is drawn in the cylinder. (CO1, K1) 1
- (a) Air and fuel
 - (b) Only fuel
 - (c) Only air
 - (d) None of these
- (1.3) The torque converter uses _____ to transfer torque. (CO2, K1) 1
- (a) Air
 - (b) Automatic transmission fluid (ATF)
 - (c) Gears
 - (d) Steel belt
- (1.4) A traction control system (TCS) in automobiles controls the (CO2, K1) 1
- (a) Vibrations on the steering wheel
 - (b) Engine power during acceleration
 - (c) Torque that is transmitted by the tyres to the road surface
 - (d) Stopping distance in case of emergency

- (1.5) The crescent shaped cavity on the piston head top surface is called as (CO3, K1) 1
- (a) Piston oil hole
 - (b) Snap ring
 - (c) Valve recess
 - (d) Valve clearance
- (1.6) The main function of the brake fluid is (CO3, K1) 1
- (a) Lubrication
 - (b) Power transmission
 - (c) Cooling
 - (d) None of these
- (1.7) The basic purpose of a four wheel drive (4WD) system is that it (CO4, K1) 1
- (a) Delivers improved cornering on dry road surfaces
 - (b) Eliminates the need of snow tyres, tyre chains, etc.
 - (c) Ensures effective transmission of engine torque to all four wheels, even on slippery road surfaces
 - (d) Ensures that effective braking can be performed, even on slippery surfaces
- (1.8) The basic characteristics of a brake fluid is (CO4, K1) 1
- (a) A high boiling point
 - (b) Low viscosity
 - (c) Compatibility with rubber and metal parts
 - (d) All of these
- (1.9) The materials used for cylinder block are (CO5, K1) 1
- (a) Cast iron and steel
 - (b) Cast iron and aluminium alloy
 - (c) Steel and aluminium alloy
 - (d) Brass and steel
- (1.10) The material generally used for cylinder sleeves is (CO5, K1) 1
- (a) Aluminium
 - (b) Ceramic
 - (c) Cast iron
 - (d) Fibre reinforced plastic

2. Attempt all parts:-

- (2.1) Give any one layout of bus. (CO1, K1) 2
- (2.2) what is alloy steel? (CO2, K1) 2
- (2.3) What do you mean by force? (CO3, K1) 2
- (2.4) What do you mean by ergonomics? (CO4, K1) 2
- (2.5) What is vibration? (CO5, K1) 2

SECTION-B

30

Answer any one of the following:-

- (3.1) What do you mean by seating arrangement in cars? (CO1, K2) 6

(3.2)	Explain the seating arrangement in buses. (CO1, K2)	6
Answer any one of the following:-		
(3.3)	What are the different properties of alloy steels? (CO2, K1)	6
(3.4)	What are the advantages of paint adhesives? (CO2, K2)	6
Answer any one of the following:-		
(3.5)	What is the purpose of aerodynamics? (CO3, K2)	6
(3.6)	Explain the various static loads acting on the vehicle. (CO3, K2)	6
Answer any one of the following:-		
(3.7)	Why vehicle stability is necessary? (CO4, K2)	6
(3.8)	How vehicle behave on a curvilinear path? (CO4, K2)	6
Answer any one of the following:-		
(3.9)	Briefly describe the energy absorbent foams? (CO5, K2)	6
(3.10)	Describe in detail the impact analysis. (CO5, K2)	6
SECTION-C		50
4. Answer any <u>one</u> of the following:-		
(4.1)	Describe the ground clearance in detail. (CO1, K3)	10
(4.2)	Describe the cant rail in detail. (CO1, K2)	10
5. Answer any <u>one</u> of the following:-		
(5.1)	Define the various methods used for the prvention of corrosion. (CO2, K2)	10
(5.2)	Differentiate between metal matrix composites and simple composites with examples and properties. (CO2, K3)	10
6. Answer any <u>one</u> of the following:-		
(6.1)	How the vehicle weight distribution is done explain with figure. (CO3, K3)	10
(6.2)	With proper diagram define the vehicle body stress analysis. (CO3, K2)	10
7. Answer any <u>one</u> of the following:-		
(7.1)	Describe the mechanical package layout in detail. (CO4, K3)	10
(7.2)	What are the various factors affecting the driver visibility? How the visibility can improve? (CO4, K2)	10
8. Answer any <u>one</u> of the following:-		
(8.1)	Describe in detail the noise characteristics that are produced during the working of vehicle. (CO5, K3)	10
(8.2)	How the noise characteristics affect the working of the vehicle. (CO5, K2)	10