Printed Page:-03 **Subject Code**:- **AME0613**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2023. 2024)

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-a. The engine oil viscosity is defined by _____ ratings. (CO1) 1

(a) Automatic transmission fluid (ATF)

(b) Society of automotive engineers (SAE)

(c) Gross vehicle weight (GVW)

(d) American petroleum institute (API)

1-b. The vehicle ride will be comfortable if (CO1) 1

(a) Unsprung mass is kept minimum

(b) Sprang mass is kept minimum

(c) Vehicle mass is kept minimum

(d) All of these

1-c. In a petrol engine, the high voltage for spark plug is in the order of (CO2) 1

(a) 1000 volts

(b) 2000 volts

(c) 11 kilovolts

(d) 22 kilovolts

1-d. The maximum torque multiplication ratio in a torque converter is about (CO2) 1

(a) 2.5

(b) 10

(c) 25

(d) 40

1-e. If the spark plug deposit indicates black coating of soot, it indicates that the engine has been generally operating on (CO3) 1

(a) Too lean mixture
(b) Stoichiometric mixture
(c) Most economical mixture
(d) Too rich mixture

1-f. Which part of the automobile tyre is subjected to greatest flexing action? (CO3) 1

(a) Bead
(b) Side wall
(c) Shoulder
(d) Tread

1-g. The heat transfer from coolant to air in the radiator of an automobile engine takes place by (CO4) 1

(a) Radiation only
(b) Convention only
(c) Convection and radiation
(d) Conduction, convection and radiation

1-h. The reconditioning process used to give cylinder bore surfaces a crosshatch pattern, is known as (CO4) 1

(a) Honing
(b) Porous plating
(c) Boring
(d) Shot peening

1-i. Which of the following is not an automobile? (CO5) 1

(a) Motor cycle
(b) Passenger car
(c) Aeroplane
(d) Truck

1-j. The basic purpose of providing caster angle on wheels is to (CO5) 1

(a) Prevent uneven tyre wear
(b) Maintain directional control
(c) Bring the road contact of the tyre under the point of load
(d) Compensate for wear in the steering linkage

2. Attempt all parts:-

2.a. What is the difference between car, bus and coach design? (CO1) 2

2.b. Give any two example of thermoplastics. (CO2) 2

2.c. What do you mean by minimum drag? (CO3) 2

2.d.	What are seating dimensions? (CO4)	2
2.e.	Give two vibration level measurement techniques. (CO5)	2
SECTION-B		30
3. Answer any five of the following:-		
3-a.	What do you mean by seating arrangement in commercial vehicles? (CO1)	6
3-b.	What are the different types of vans? (CO1)	6
3-c.	What are the different properties of high strength composites? (CO2)	6
3-d.	What are the different properties of semi rigid PUT foams? (CO2)	6
3.e.	What are various vehicle body optimization techniques? (CO3)	6
3.f.	How vehicle stability plays an important role in design? (CO4)	6
3.g.	What is the function passive restraint system explain? (CO5)	6
SECTION-C		50
4. Answer any one of the following:-		
4-a.	Differentiate between skirt rail and truss panel. (CO1)	10
4-b.	What is significance of loading capacity in buses? (CO1)	10
5. Answer any one of the following:-		
5-a.	Give the various examples of sandwich panel with diagrams. (CO2)	10
5-b.	Explain ABS and styrene and give any two examples. (CO2)	10
6. Answer any one of the following:-		
6-a.	Explain the various types of side loads with arrow diagrams. (CO3)	10
6-b.	Describe the various tests performed with the scale models. (CO3)	10
7. Answer any one of the following:-		
7-a.	How seating dimensions are decided and what are the factors affecting seating dimensions? (CO4)	10
7-b.	Explain the various electronic displays used in vehicle with proper example. (CO4)	10
8. Answer any one of the following:-		
8-a.	What are the various methods to reduce the chassis bearing vibrations? (CO5)	10
8-b.	Explain in details the side impact analysis.Why they are used and what is their purpose? (CO5)	10