

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI EXAMINATION – SUMMER 2025****Subject Code: 3161920****Date: 30-05-2025****Subject Name: Automobile Engineering****Time: 10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Draw the vehicle layout of (1) front engine front wheel drive (2) four wheel drive in automobile	03
	(b) Classify automobile vehicles based on any four criteria	04
	(c) Explain different types of vehicle bodies with neat sketch.	07
Q.2	(a) Explain rolling resistance, gradient resistance and wind resistance	03
	(b) Write the various types of loads acting on vehicle body. Explain any one with neat sketch.	04
	(c) Write a short note on vehicle aerodynamics.	07
	OR	
	(c) Explain various resistance to motion of a vehicle in detail.	07
Q.3	(a) Point out need of clutch in automobile	03
	(b) Draw the layout of transmission system	04
	(c) Explain constant mesh gearbox working with neat sketch	07
	OR	
Q.3	(a) Give the function of (1) propeller shaft and (2) universal joint	03
	(b) Compare Hotchkiss drive with torque tube drive	04
	(c) Explain the necessity, construction and operation of the differential	07
Q.4	(a) Define caster, camber, King pin inclination	03
	(b) What are function of steering system? what are the requirement of good steering system?	04
	(c) Explain double wishbone suspension system.	07
	OR	
Q.4	(a) List advantages and disadvantages of telescopic shock absorber	03
	(b) Differentiate disc brake and drum brake	04
	(c) Explain Antilock Braking System in detail.	07
Q.5	(a) What is wheel alignment?	03
	(b) What is wheel balancing? explain requirement of wheel balancing	04
	(c) Draw a simplified wiring circuit for the lighting system of car	07
	OR	
Q.5	(a) Explain recent trends with modern vehicle	03
	(b) List the various electronic components used in automobile system	04
	(c) Describe in detail constructional features of the tube and tubeless tyres for automotive use. Discuss also their relative merits and demerits	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:3161920****Date:24-05-2024****Subject Name:Automobile Engineering****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Give classification of automobiles.	03
	(b) Explain function of Automobile chassis.	04
	(c) Discuss functional requirements of vehicle body.	07
Q.2	(a) Define Transmission efficiency.	03
	(b) Explain different forces acting on vehicle in motion.	04
	(c) Discuss stability of a vehicle in motion around the curve.	07
	OR	
	(c) Explain vehicle body construction type and materials.	07
Q.3	(a) Classify types of clutch.	03
	(b) Compare semi centrifugal and centrifugal clutch.	04
	(c) Explain constructional features and working of single plate with neat sketch.	07
	OR	
Q.3	(a) What is continuous variable transmission CVT?	03
	(b) Explain function of propeller shaft.	04
	(c) Discuss fault and diagnosis of power transmission system.	07
Q.4	(a) What is difference between live and dead axle?	03
	(b) Explain types of suspension systems.	04
	(c) Explain working of differential gear box with neat sketch.	07
	OR	
Q.4	(a) What is function of suspension system in automobiles?	03
	(b) Enlist different types of steering gear and explain anyone them with neat sketch.	04
	(c) Write short note on power assisted steering.	07
Q.5	(a) Explain function of air bag in automobile.	03
	(b) Discuss briefly about active and passive safety systems.	04
	(c) Write short note on power assisted brakes.	07
	OR	
Q.5	(a) Explain tyre properties.	03
	(b) Explain Tire Pressure Monitoring System (TPMS).	04
	(c) Explain layout and components of Electric Vehicle.	07

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023

Subject Code:3161920

Date:14-07-2023

Subject Name:Automobile Engineering

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

- 1. Attempt all questions.**
 - 2. Make suitable assumptions wherever necessary.**
 - 3. Figures to the right indicate full marks.**
- Simple and non-programmable scientific calculators are allowed**

- Q.1**
- | | | |
|-----|--|-----------|
| (a) | Give a brief history of automobile development. | 03 |
| (b) | Define and discuss the air resistance, rolling resistance and gradient resistance. | 04 |
| (c) | What is equivalent weight of vehicle? Derive the equation for equivalent weight for a vehicle. | 07 |

- Q.2**
- | | | |
|-----|---|-----------|
| (a) | What are the essential properties required for clutch facing materials? | 03 |
| (b) | Why is a synchronizer ring sometimes used in gear-box? What are its merits and demerits compared to sliding mesh. | 04 |
| (c) | Why the differential is needed in automobile? Draw a neat diagram and explain its operation. | 07 |

OR

- | | | |
|-----|--|-----------|
| (c) | Explain with neat sketch torque converter. | 07 |
|-----|--|-----------|

- Q.3**
- | | | |
|-----|---|-----------|
| (a) | Draw neat sketch of rack and pinion type steering gear. | 03 |
| (b) | Write short note on camber angle and castor angle. | 04 |
| (c) | With neat sketch explain telescopic type shock absorber | 07 |

OR

- Q.3**
- | | | |
|-----|---|-----------|
| (a) | What is bleeding of brake? Why it is necessary? Explain the procedure used during bleeding. | 03 |
| (b) | Draw a neat diagram of disc type wheel and compare with wire type wheel. | 04 |
| (c) | What is electronic stability control? Explain in brief the working of ESC. | 07 |

- Q.4**
- | | | |
|-----|---|-----------|
| (a) | What are the limitations of electrically operated vehicles compared to conventional vehicles? | 03 |
| (b) | Explain hydrogen-oxygen fuel cell as a source of energy. | 04 |
| (c) | Derive expressions for effective mean radius and torque transmitted in case of a single plate clutch assuming different conditions. | 07 |

OR

- Q.4** (a) Explain in detail – Double Declutching. **03**
(b) Draw neat schematic diagram showing the layout of an air suspension system. **04**
(c) What is perfect steering? Derive expression for the basic condition for a perfect steering mechanism. **07**

- Q.5** (a) Explain the working of night vision system in auto vehicle. **03**
(b) Derive maximum possible velocity to avoid skidding for the vehicle moving on a level curved path. **04**
(c) Explain in detail the necessity and principle of working of an antilock brake system. Describe its main components and discuss various types of such systems in use. **07**

OR

- Q.5** (a) Explain active and passive safety system in auto vehicle. **03**
(b) With neat sketch explain leaf spring suspension system. **04**
(c) What is a CVT? Describe its principle of working in detail with the help of simple diagrams. Discuss also its main advantages and limitations. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3161920****Date:10/06/2022****Subject Name:Automobile Engineering****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- | | | | |
|------------|-----|---|-----------|
| Q.1 | (a) | What is automotive system? Classify the vehicle with respect to its body types. | 03 |
| | (b) | Explain function of frame | 04 |
| | (c) | List the different components which are included in chassis. Classify the chassis and explain functions of chassis. | 07 |
| Q.2 | (a) | Analyze the selection of body member cross sections. | 03 |
| | (b) | Discuss three types of resistances acting on Automobile vehicles. | 04 |
| | (c) | Draw the Four-wheel drive vehicle layout. State three advantages and three disadvantages of it. | 07 |
| | | OR | |
| | (c) | Write a short note on vehicle aerodynamics. | 07 |
| Q.3 | (a) | List advantages and disadvantages of telescopic shock absorber. | 03 |
| | (b) | Compare Drum and Disc types of brakes. | 04 |
| | (c) | Describe the construction and explain working of Ackermann steering mechanism with a neat sketch | 07 |
| | | OR | |
| Q.3 | (a) | Compare Hotchkiss drive with Torque tube drive. | 03 |
| | (b) | What is the function of propeller shaft? Also draw its figure. | 04 |
| | (c) | Explain the necessity of a differential in an automobile. Discuss in detail the construction and operation of the differential. | 07 |
| Q.4 | (a) | State the necessity of transmission in an Automobile vehicle | 03 |
| | (b) | Describe the construction of Leaf spring suspension system with neat sketch. | 04 |
| | (c) | Explain with a neat sketch the working of a Synchromesh mesh type gear box used in automobiles. | 07 |
| | | OR | |
| Q.4 | (a) | How automatic transmission works? | 03 |
| | (b) | Explain the working of power steering | 04 |
| | (c) | Describe construction and explain working of centrifugal clutch with neat sketch. | 07 |
| Q.5 | (a) | Define Braking Distance, Braking Efficiency, Slip Ratio. | 03 |
| | (b) | List any four types of lights used in modern vehicle and state their purpose | 04 |
| | (c) | What is ABS? List different components of ABS and explain ABS with neat sketch. | 07 |

OR

- | | | | |
|------------|------------|--|-----------|
| Q.5 | (a) | Explain tire designation. | 03 |
| | (b) | List any four types of electronic components of vehicle and state their use. | 04 |
| | (c) | Draw lighting circuit with all nomenclature and explain its components. | 07 |
