

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VI EXAMINATION – WINTER 2025

Subject Code:3161920

Date:25-11-2025

Subject Name:Automobile Engineering

Time:02:30 PM TO 05:00 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

- |            |     |   |           |
|------------|-----|---|-----------|
| <b>Q.1</b> | (a) | Draw the vehicle layouts showing (1) Front engine front wheel drive and (2) Four wheel drive in Automobile. | <b>03</b> |
|            | (b) | What are the functions of chassis? List components installed on chassis.                                    | <b>04</b> |
|            | (c) | Explain different types of vehicle bodies with neat sketch with its constructional features.                | <b>07</b> |
| <b>Q.2</b> | (a) | Define road resistance, gradient resistance and tractive force.   | <b>03</b> |
|            | (b) | Derive the equation of maximum speed of vehicle while taking a left turn on road for its stability.         | <b>04</b> |
|            | (c) | Explain with figure construction and working of multi plate clutch.   | <b>07</b> |
|            |     | <b>OR</b>   |           |
|            | (c) | Explain semi centrifugal clutch with neat sketch. Also compare it with centrifugal clutch.                  | <b>07</b> |
| <b>Q.3</b> | (a) | What are the functions of suspension system?  | <b>03</b> |
|            | (b) | Explain briefly 1. Castor angle and 2. King pin inclination.  | <b>04</b> |
|            | (c) | Explain Wishbone type suspension system.  | <b>07</b> |
|            |     | <b>OR</b>   |           |
| <b>Q.3</b> | (a) | What do you mean by understeer and oversteer?   | <b>03</b> |
|            | (b) | What is toe in and toe out? When they are used in vehicle design?   | <b>04</b> |
|            | (c) | Write a short note on electric power steering.  | <b>07</b> |
| <b>Q.4</b> | (a) | Why differential gear box is used in vehicles?  | <b>03</b> |
|            | (b) | Explain the necessity of transmission in a vehicle.   | <b>04</b> |
|            | (c) | Explain working and construction of sliding mesh gear box.  | <b>07</b> |
|            |     | <b>OR</b>   |           |
| <b>Q.4</b> | (a) | What is the function of brake? Give its classification.   | <b>03</b> |
|            | (b) | Give the comparison between hydraulic brake and mechanical brake  | <b>04</b> |
|            | (c) | What is the meaning of ABS in vehicle? Explain about it in detail.  | <b>07</b> |

- Q.5** (a) Differentiate active and passive safety system. **03**
- (b) Explain the relation between tire pressure and tire wear pattern with neat sketch. **04**
- (c) Enlist types of hybrid vehicle. Explain any one in details. **07**

**OR**

- Q.5** (a) What is the advantage of Air - bags in car? How does Air - bag work? **03**
- (b) Compare Hotchkiss drive with Torque tube drive. **04**
- (c) What troubles are commonly experienced in the electric system of a car? **07**  
Suggest suitable remedies to rectify those faults.

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