

**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**

**Q.1 (a)** Draw the vehicle layouts showing (1) Front engine front wheel drive and **03**  
(2) Four wheel drive in Automobile.

**(b)** What are the functions of chassis? List components installed on chassis. **04**

**(c)** Explain different types of vehicle bodies with neat sketch with its  
constructional features. **07**

**Q.2 (a)** Define road resistance, gradient resistance and tractive force. **03**

**(b)** Derive the equation of maximum speed of vehicle while taking a left turn  
on road for its stability. **04**

**(c)** Explain with figure construction and working of multi plate clutch. **07**

**OR**

**(c)** Explain semi centrifugal clutch with neat sketch. Also compare it with  
centrifugal clutch. **07**

**Q.3 (a)** What are the functions of suspension system? **03**

**(b)** Explain briefly 1. Castor angle and 2. King pin inclination. **04**

**(c)** Explain Wishbone type suspension system. **07**

**OR**

**Q.3 (a)** What do you mean by understeer and oversteer? **03**

**(b)** What is toe in and toe out? When they are used in vehicle design? **04**

**(c)** Write a short note on electric power steering. **07**

**Q.4 (a)** Why differential gear box is used in vehicles? **03**

**(b)** Explain the necessity of transmission in a vehicle. **04**

**(c)** Explain working and construction of sliding mesh gear box. **07**

**OR**

**Q.4 (a)** What is the function of brake? Give its classification. **03**

**(b)** Give the comparison between hydraulic brake and mechanical brake **04**

**(c)** What is the meaning of ABS in vehicle? Explain about it in detail. **07**

**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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