

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3161920****Date:17-12-2022****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.

- Q.1** (a) Compare Front wheel drive layout and rear wheel drive layout for passenger car. **03**
- (b) Describe various forces acting on vehicle body with neat sketch. **04**
- (c) Describe the change in reaction force on tyres of car for following conditions **07**
- (1) Starting with acceleration if car has front wheel drive
- (2) Starting with acceleration if car has rear wheel drive
- (3) While taking a right curve with uniform velocity
- (4) While applying a short break.
- Q.2** (a) Why bike has a lever to engage and disengage clutch but in active it is missing? **03**
- (b) Differentiate between single plate and multi plate clutch. **04**
- (c) Explain Rolling resistance, Grade resistance and Tractive force (with uniform speed and with acceleration) for a vehicle in motion, with neat sketch **07**
- OR**
- (c) Derive the equation of maximum speed of vehicle while taking a left turn on road for its stability. **07**
- Q.3** (a) Why differential gear box is used in vehicles? **03**
- (b) Differentiate between manual transmission and continuously variable transmission. **04**
- (c) Explain the construction and working of sliding mesh gear box using neat sketch. **07**
- OR**
- Q.3** (a) Give classification of axle used in vehicles. **03**
- (b) What is toe in and toe out? When they are used in vehicle design? **04**
- (c) How centrifugal clutch is different from normal clutch? Explain its construction and working with neat sketch. **07**
- Q.4** (a) Explain different forces acting of front axle of truck with neat sketch. **03**
- (b) Define King pin inclination and explain its importance in vehicle. **04**
- (c) Which are the functional requirements of suspension system? Explain working of air suspension system. **07**
- OR**
- Q.4** (a) What are the functional requirements of braking system? **03**
- (b) Explain the relation between tyre pressure and tyre wear pattern with neat sketch. **04**
- (c) What is the meaning of ABS in vehicle? Explain about it in detail. **07**
- Q.5** (a) Differentiate between Active and Passive Safety systems in automobiles. **03**
- (b) Explain the working of Hydraulic brake with neat sketch. **04**

- (c) What is regenerative breaking? How it is achieved? Describe different methods used for the same. **07**

OR

- Q.5** (a) What is Adaptive Cruise Control? How it is useful. **03**
(b) What is the advantage of Air bags in car? How it is working? **04**
(c) Write a note on Hybrid Vehicles and various technology used for the same. **07**
