

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3161920****Date:13-12-2023****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) Describe the development stages of automobile **03**
 (b) Explain in brief the specifications of automobile bodies. **04**
 (c) Explain rolling resistance, gradient resistance and wind resistance. **07**

- Q.2** (a) Explain the importance of aerodynamic shape of car body. **03**
 (b) Write the various types of loads acting on vehicle body. Explain any one with neat sketch. **04**
 (c) Explain the single plate clutch with neat sketch. **07**

OR

- (c) Explain automatic transmission in detail. **07**
Q.3 (a) What is the purpose of providing universal joint and slip joint with the propeller shaft? **03**
 (b) Explain torque converter with neat sketch. **04**
 (c) With the help of road performance curve explain the necessity of gear box in an Automobile. **07**

OR

- Q.3** (a) Distinguish between the cross type and ball trunnion type universal joint. **03**
 (b) Explain the working of conventional differential gear box with neat sketch. **04**
 (c) What is synchromesh device? Describe the working of synchromesh gear box. **07**

- Q.4** (a) Enlist the types of front axle independent suspension system. **03**
 (b) Explain re-circulating ball type steering gear with sketch. **04**
 (c) Explain with sketch telescopic shock absorber. **07**

OR

- Q.4** (a) Define: caster, camber and king pin inclination. **03**
 (b) Sketch schematic arrangement of vacuum operated brake and explain its working. **04**
 (c) Explain with neat sketch wishbone type suspension system. **07**

- Q.5** (a) "Battery is the heart of the electrical system of an automobile." **03**
 Comment on the validity of this statement.
 (b) State the functions and requirements of automobile wheel tyre. **04**
 (c) Describe, with neat sketch the construction and working of lead-acid battery which is normally used in automobile. **07**

OR

- Q.5** (a) State the principle of starting motor. **03**
 (b) What troubles are commonly experienced in the lighting system of a car? Suggest suitable remedies to rectify those faults. **04**
 (c) Explain modern technology used in automobile. **07**
