

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-IV EXAMINATION – WINTER 2025

Subject Code:3140203

Date:13-11-2025

Subject Name:Basics of Automobile Systems

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) Classify automobiles. **03**
(b) How does the engine power and torque vary with the engine speed? **04**
(c) Enlist different types of automobile frames with suitable examples. Compare their merits and demerits. **07**
- Q.2** (a) Explain significance of gear box in the vehicle. **03**
(b) Explain how gear selector mechanism works for the vehicle? **04**
(c) Explain sliding mesh gear box with different gear position. **07**
- OR**
- (c) Discuss electrical drive with its advantages. **07**
- Q.3** (a) Discuss the function of universal joints in power transmission. **03**
(b) Explain fully floating rear axles with the aid of suitable sketch. **04**
(c) Explain importance, construction and working of differential gear with neat sketch. **07**
- OR**
- Q.3** (a) What is the difference between a 'dead front axle' and a 'live front axle'? **03**
(b) Give the construction of a front axle. **04**
(c) Explain principle and give advantages and limitations of electric drive. **07**
- Q.4** (a) What is bleeding of brakes? **03**
(b) Discuss braking efficiency and stopping distance. **04**
(c) Explain telescopic shock absorber in brief. **07**
- OR**
- Q.4** (a) How torsion bar works? **03**
(b) Categorize master cylinder and explain it. **04**
(c) What are the essential differences between mechanical brakes and hydraulic brake system? **07**
- Q.5** (a) Why is alignment required in automobile? **03**
(b) Compare the tube tyre and tubeless tyre. **04**
(c) Explain construction of tyre with suitable sketch. **07**

OR

- Q.5** (a) What is the purpose of a steering system in a vehicle? State the requirements of a good steering system. **03**
- (b) Explain different types of tyre wear. **04**
- (c) Which are primary wheel alignment angles? Define each with suitable diagram. **07**
Explain their effects on vehicle wheel alignment.
