

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3171112****Date:16-12-2023****Subject Name: Automotive Electronics****Time: 10:30 AM TO 01:00 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) Write the advantage of Electronics in automobile. **03**  
 (b) What is Actuator? List the actuator used in automobile. **04**  
 (c) Explain the working of SI Engine, with suitable diagram? **07**
- Q.2** (a) List the desire function of catalytic converter. **03**  
 (b) What are the major controller inputs and outputs from/to Engine? Show their connection between Engine and Controller. **04**  
 (c) What are the seven mode of fuel control? Explain with neat diagram digital engine control system. **07**
- OR**
- (c) Explain the working of Fuel Injector and pulse mode fuel control signal with relevant diagrams and waveforms. **07**
- Q.3** (a) Define Engine performance term Power, BSFC, torque with their relevant formula and their units. **03**  
 (b) Explain the effect of air fuel ratio on performance. **04**  
 (c) Explain Idle speed control with relevant diagram **07**
- OR**
- Q.3** (a) What is sparkplug? Why it is required in automotive vehicle? **03**  
 (b) With neat block diagram explain EGR Control. **04**  
 (c) With neat diagram explain electronic ignition control system. **07**
- Q.4** (a) Explain following sensor **03**  
 1. Knock 2. Crankshaft Angular Position 3. Air Bag Sensor  
 (b) Explain EGR actuator control with a relevant diagram **04**  
 (c) With relevant diagram Explain digital Speed sensor. **07**
- OR**
- Q.4** (a) Explain following **03**  
 1. Solid State relays 2. EGO 3. Fuel Injector Actuator  
 (b) Explain stepper motor actuator with neat diagram **04**  
 (c) What is hall effect? Explain Position sensor using principal of hall effect. Compare with magnetic reluctance sensor. **07**
- Q.5** (a) List the communication buses used in vehicle network **03**  
 (b) Explain Accelerometer based Air bag system with relevant diagrams **04**  
 (c) Explain CAN protocol in detail. **07**
- OR**
- Q.5** (a) Explain Antilock Braking System with relevant diagrams. **03**  
 (b) Explain low tire-pressure warning system with relevant diagrams **04**  
 (c) Explain the working of battery operated electric vehicles. **07**

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