Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2024

Subject Code:3171112 Date:30-05-2024

Subject Name:Automotive Electronics

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)**	Outline the need of Electronics in automobile.	**03**
	(b)	Describe the different types of electronic systems used in automobiles, including their primary functions and applications.	**04**
	(c)	Describe low tire-pressure warning system with relevant diagram.	**07**
Q.2	**(a)**	how alternators are used in the vehicles?	**03**
	(b)	what is sensor? List the sensor used in automobile.	**04**
	(c)	Can you categorize and explain the seven modes of fuel control in a digital engine control system using a diagram to aid your explanation?	**07**
		OR	
	(c)	What is idle speed control and why is it necessary? How important is idle speed control for overall engine performance?	**07**
Q.3	**(a)**	What is engine torque, and how is it related to other performance metrics like power and fuel consumption?	**03**
	(b)	What is a throttle angle sensor (TAS), and how does it help in regulating engine performance?	**04**
	(c)	What are the primary inputs to an engine controller, and how are they used to regulate engine performance?	**07**
		OR	
Q.3	**(a)**	What is a pneumatic motor, and how is it used in automotive applications?	**03**
	(b)	How does the air/fuel ratio affect engine performance, and how is it regulated by the engine control system?	**04**
	(c)	What is the function of an optical crankshaft position sensor, explain working of it and how does it differ from other types of position sensors?	**07**
Q.4	**(a)**	What is the role of automotive ignition control actuators, and how do they function in the engine control system?	**03**
	(b)	How does an antilock braking system (ABS) function, and what advantages does it offer over traditional braking systems?	**04**
	(c)	How does a Hall effect position sensor work, and what is its application in automotive systems?	**07**
		OR	

Q.4	**(a)**	What is the purpose of on-board diagnosis (OBD) systems in vehicles, and how do they work?	**03**
	(b)	What are piezoelectric force generators, and what advantages do they offer in actuator technology?	**04**
	(c)	Describe the features and operation of the CAN protocol, including its applications in modern automotive systems.	**07**
Q.5	**(a)**	How do climatic control systems function in vehicles, and what features do these systems typically include?	**03**
	(b)	How has the use of electrical components and systems in vehicles evolved over time, and what are some of the implications for future vehicle design and development?	**04**
	(c)	How does digital cruise control work? What hardware implementation issues may arise when designing a digital cruise control system for a vehicle, and how can they be addressed?	**07**

OR

Q.5	**(a)**	List the communication buses used in vehicle network and discuss it.	**03**
	(b)	How do automotive alarms work, and what features are typically included in these systems?	**04**
	(c)	What are the different types of electrical circuits and wiring used in vehicles, and how are they designed to handle different loads?	**07**

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