

GUJARAT TECHNOLOGICAL UNIVERSITY**BE MINOR- SEMESTER-VI EXAMINATION – WINTER 2025****Subject Code:116AL01****Date:06-12-2025****Subject Name:Data Communication and Embedded Systems in Electrical Vehicles****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) Explain the concept of coupling of networks in vehicular communication systems.	03
	(b) Write requirements of bus systems in vehicular networks.	04
	(c) Classify the bus system used in vehicular network.	07
Q.2	(a) What is the Importance of Communication in automation?	03
	(b) Explain Communication requirement for Embedded System.	04
	(c) What is an embedded network? Discuss design of embedded systems.	07
	OR	
	(c) Compare the CAN and CAN-FD bus systems used in automotive applications.	07
Q.3	(a) Give full form of (1) LIN (2) VANET (3) TCP.	03
	(b) Explain the standard CAN data frame.	04
	(c) Explain in brief Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communications.	07
	OR	
Q.3	(a) Describe the concept of VANET.	03
	(b) State advantages and disadvantages of CAN bus.	04
	(c) Define IEEE 802.11P. Explain it with a neat diagram.	07
Q.4	(a) Explain the RARP (Reverse Address Resolution Protocol)	03
	(b) What is network protocol? Explain TCP.	04
	(c) Discuss the importance of time-triggered communication in the architecture of TTCAN.	07
	OR	
Q.4	(a) Explain the ARP (Address Resolution Protocol).	03
	(b) Explain the SAE J1939 standard.	04
	(c) Discuss the role of Electronic Control Units (ECUs) and bus interfaces in vehicle communication systems.	07
Q.5	(a) Define Control channel, synchronous channel and asynchronous channel.	03
	(b) Explain media access control in the context of FlexRay communication.	04
	(c) What are the latest trends in vehicular networking? Explain advantages of new car networking protocols.	07
	OR	
Q.5	(a) What is the LIN protocol?	03
	(b) Describe how messages transfer through CAN bus.	04
	(c) Briefly explain the FlexRay frame format.	07