Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160716 Date: 26-05-2025

Subject Name: IOT and applications

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.**

			MARKS
Q.1*	**(a)**	Describe Internet of Things.	**03**
	(b)	(i) List the sources of IoT development board which can be used for prototype development. (ii) List communication protocols used in IoT.	**04**
	(c)	Explain various levels of IoT.	**07**
Q.2	**(a)**	List the sensors that may be useful for Smart Home.	**03**
	(b)	What do you mean by actuators? Give examples of commonly used actuators in IoT.	**04**
	(c)	Explain the key features of the ARM Cortex-M architecture that make it suitable for IoT.	**07**
		OR	
	(c)	Define following properties of sensors: i. Accuracy ii. Precision iii. Drift iv. Resolution	**07**
Q.3	**(a)**	What do you understand by 6LoWPAN (IPv6 over Low-Power Wireless Personal Area Networks)?	**03**
	(b)	How IPv6 address limitations of IPv4 in context of IoT?	**04**
	(c)	In context of MQTT (Message Queuing Telemetry Transport) answer following questions in brief: (i) Define broker in MQTT? (ii) In MQTT, what is the communication pattern(architecture) used to send and receive messages? (ii) In MQTT, which QoS level ensures that a message is delivered exactly once without duplication? (iv) Give the use of '#' wildcard for topic subscription.	**07**
		OR	
Q.3	**(a)**	Compare CoAP's request/response model with HTTP's request/response model. How does CoAP's asynchronous nature make it more suitable for constrained networks?	**03**
	(b)	Describe the four main types of messages used in CoAP (Confirmable, Non-confirmable, Acknowledgment, and Reset). How are these messages used to ensure reliable communication?	**04**
	(c)	Discuss the importance of cloud security in IoT.	**07**
Q.4	**(a)**	Explain Bluetooth Low Energy (BLE).	**03**

	(b)	How does cloud computing enhance the scalability, storage, and computational capabilities of IoT systems?	**04**
	(c)	What do you mean by Fog computing? Discuss the advantages and disadvantages of fog computing for IoT applications compared to pure cloud solutions.	**07**

OR

Q.4	**(a)**	List sensors which can be used for Driver Assistance.	**03**
	(b)	How is IoT transforming patient care in healthcare? Discuss the role of wearable devices and remote monitoring systems in improving patient outcomes and reducing hospital visits.	**04**
	(c)	What are various cloud service models (IaaS, PaaS, SaaS). Discuss in detail in context of IoT application development.	**07**
Q.5	**(a)**	Compare Raspberry pi with Arduino.	**03**
	(b)	How many digital and analog input pins are available on the Arduino Uno? What is the difference between them?	**04**
	(c)	Write the purpose of following functions in Arduino: i. loop() ii. setup() iii. delay() iv. pinMode()	**07**

OR

Q.5	**(a)**	List enabling technologies for IoT.	**03**
	(b)	Explain the potential privacy concerns associated with IoT devices in smart homes and healthcare systems.	**04**
	(c)	Discuss various security issues in IoT?	**07**