

**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.

		<b>MARKS</b>
<b>Q.1*</b>	<b>(a)</b> Describe Internet of Things.	<b>03</b>
	<b>(b)</b> (i) List the sources of IoT development board which can be used for prototype development. (ii) List communication protocols used in IoT.	<b>04</b>
	<b>(c)</b> Explain various levels of IoT.	<b>07</b>
<b>Q.2</b>	<b>(a)</b> List the sensors that may be useful for Smart Home.	<b>03</b>
	<b>(b)</b> What do you mean by actuators? Give examples of commonly used actuators in IoT.	<b>04</b>
	<b>(c)</b> Explain the key features of the ARM Cortex-M architecture that make it suitable for IoT.	<b>07</b>
<b>OR</b>		
	<b>(c)</b> Define following properties of sensors: i. Accuracy ii. Precision iii. Drift iv. Resolution	<b>07</b>
<b>Q.3</b>	<b>(a)</b> What do you understand by 6LoWPAN (IPv6 over Low-Power Wireless Personal Area Networks)?	<b>03</b>
	<b>(b)</b> How IPv6 address limitations of IPv4 in context of IoT?	<b>04</b>
	<b>(c)</b> 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.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	<b>(a)</b> 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?	<b>03</b>
	<b>(b)</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?	<b>04</b>
	<b>(c)</b> Discuss the importance of cloud security in IoT.	<b>07</b>
<b>Q.4</b>	<b>(a)</b> Explain Bluetooth Low Energy (BLE).	<b>03</b>

- (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: **07**
  - i. loop()
  - ii. setup()
  - iii. delay()
  - iv. pinMode()

**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**

Enrolment No./Seat No \_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160716

Date:20-05-2024

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.
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4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Explain Sensor interfacing.	03
	(b) Explain the Characteristics of IoT.	04
	(c) Explain challenges of IoT.	07
Q.2	(a) What is IP addressing?	03
	(b) Compare IPv4 and IPv6 in brief.	04
	(c) Explain various levels of IoT.	07
	<b>OR</b>	
	(c) List security issues and needs in IoT. Justify the answer.	07
Q.3	(a) Explain IoT and cyber physical system.	03
	(b) Explain CoAP. List the key features of CoAP.	04
	(c) Explain with diagram IPv6 header format	07
	<b>OR</b>	
Q.3	(a) List and explain cloud components.	03
	(b) Explain the brain in an IoT device.	04
	(c) Explain with diagram IPv4 header format	07
Q.4	(a) What is Messaging protocols.	03
	(b) Discuss Security in cloud.	04
	(c) Compare IoT and cloud.	07
	<b>OR</b>	
Q.4	(a) Explain Warehouse application with IoT.	03
	(b) Explain CSPR in ARM.	04
	(c) Discuss various application of IoT.	07
Q.5	(a) Explain Arduino in brief.	03
	(b) What does the future hold for smart home technology?	04
	(c) Draw and explain IoT based collision impact measuring system architecture.	07
	<b>OR</b>	
Q.5	(a) Explain in brief future factory concepts	03
	(b) Explain Raspberry Pi.	04
	(c) What risks do insecure IoT devices bring to privacy and security?	07

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3160716****Date:10-07-2023****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.

		<b>MARKS</b>
<b>Q.1</b>	<b>(a)</b> List out enabling technologies in IOT. Explain any one in details	<b>03</b>
	<b>(b)</b> Explain characteristics of the IoT.	<b>04</b>
	<b>(c)</b> Draw and Explain ATMEGA328P Microcontroller Pin diagram.	<b>07</b>
<b>Q.2</b>	<b>(a)</b> Explain MQTT Broker and client.	<b>03</b>
	<b>(b)</b> Differentiate MQTT and CoAP.	<b>04</b>
	<b>(c)</b> Explain IoT Technology Stack.	<b>07</b>
<b>OR</b>		
	<b>(c)</b> Draw and explain IPv6 Header.	<b>07</b>
<b>Q.3</b>	<b>(a)</b> Explain IOT messaging protocol in detail.	<b>03</b>
	<b>(b)</b> Difference between Microcontroller and Microprocessor.	<b>04</b>
	<b>(c)</b> What is ARM? Explain special feature of ARM processor.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	<b>(a)</b> Explain Ultrasonic sound sensor.	<b>03</b>
	<b>(b)</b> Write Raspberry Pi code to blink LED ON and OFF,	<b>04</b>
	<b>(c)</b> What is BLE? Explain components of BLE.	<b>07</b>
<b>Q.4</b>	<b>(a)</b> Explain Various application of IoT in Food and Healthcare.	<b>03</b>
	<b>(b)</b> Explain CoAP. List the key features of CoAP	<b>04</b>
	<b>(c)</b> What is fog computing? List the characteristics of fog computing.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	<b>(a)</b> Explain Various application of IoT in Retail.	<b>03</b>
	<b>(b)</b> Explain limitation of cloud computing.	<b>04</b>
	<b>(c)</b> Discuss various types of Cloud Computing in IOT.	<b>07</b>
<b>Q.5</b>	<b>(a)</b> Explain IoT and cyber physical system	<b>03</b>
	<b>(b)</b> Describe IOT security needs and issues.	<b>04</b>
	<b>(c)</b> What is Arduino? Explain features of Arduino architecture.	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	<b>(a)</b> What are the challenges of IOT security?	<b>03</b>
	<b>(b)</b> Explain any one algorithm for IOT security	<b>04</b>
	<b>(c)</b> Explain various security issues and need for developing IOT based application.	<b>07</b>

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3160716****Date:06/06/2022****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.

		<b>Marks</b>
<b>Q.1</b>	(a) List any five IoT applications. Explain any one in details.	<b>03</b>
	(b) What is Sensor ? List different types of Sensors used to develop IOT	<b>04</b>
	(c) Draw and Explain ATMEGA328P Microcontroller Pin diagram.	<b>07</b>
<b>Q.2</b>	(a) Explain MQTT Broker and client.	<b>03</b>
	(b) Differentiate CoAP and MQTT.	<b>04</b>
	(c) Draw and explain IPv4 Header.	<b>07</b>
<b>OR</b>		
	(c) Draw and explain IPv6 Header.	<b>07</b>
<b>Q.3</b>	(a) Explain pinMode(), digitalRead() and digitalWrite () functions of Arduino	<b>03</b>
	(b) Write Raspberry Pi code to change the brightness of LED.	<b>04</b>
	(c) Write arduino code to identify PH value of Soap , Tap water and Lemon juice using PH sensor.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) What is PWM? Explain usage of PWM pins with Example.	<b>03</b>
	(b) Write Raspberry Pi code to blink LED ON and OFF .	<b>04</b>
	(c) Write arduino code to transmit “Hello World – Code to demonstrate BT Communication” string on serial monitor using Bluetooth	<b>07</b>
<b>Q.4</b>	(a) Explain Various application of IoT in Food and Healthcare.	<b>03</b>
	(b) Which are the challenges in IoT with Cloud Computing? Explain any one.	<b>04</b>
	(c) List and explain various types of Cloud Deployment Models, also discuss their merits and demerits	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) Explain Various application of IoT in Retail.	<b>03</b>
	(b) Explain Security in cloud with respect to IOT based application.	<b>04</b>
	(c) Discuss various types of Cloud Computing	<b>07</b>
<b>Q.5</b>	(a) Explain IoT and cyber physical system.	<b>03</b>
	(b) Explain any one algorithm for IOT security.	<b>04</b>
	(c) Draw and explain architecture of IOT security	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	(a) Explain IOT and WSN.	<b>03</b>
	(b) Explain IOT security challenges.	<b>04</b>
	(c) Explain various security issues and need for developing IOT based application.	<b>07</b>

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