GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2024

Subject Code:3171108   **Date:20-05-2024**

Subject Name:Internet of Things

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)**	Differentiate M2M & IOT systems.	**03**
	(b)	Draw the logical design of IOT and explain in brief.	**04**
	(c)	Discuss the IOTWF Reference model.	**07**
Q.2	**(a)**	Describe Cloud Computing.	**03**
	(b)	Decode-and evaluate the output of the following program on Arduino board	**04**

```
void setup ()
{pinMode(D0, OUTPUT);
}
void loop()
{
digitalWrite(D0, HIGH);
delay(2000);
digitalWrite(D0, LOW);
delay(5000);
}
```

	(c)	Classify various types of sensors used in IOT systems and enlist the examples for each type.	**07**

OR

	(c)	Write a program to detect the current signal issued by current sensor to Arduino board at its analog pin. The sensor is installed in a Industrial Power feeder. (Assuming: The output of Sensor is 0 to 5 Volts for 0 to 100 A range.)	**07**
Q.3	**(a)**	Draw and describe Arduino boards system architecture and pins.	**03**
	(b)	Enlist various methods of uploading data from on field sensors to the cloud or on Mobile phones.	**04**
	(c)	Discuss XMPP Protocol for embedded device	**07**

OR

Q.3	**(a)**	Draw and describe basic Raspberry-pi boards pins functionalities.	**03**

(b)	What are IOT Gateways and enlist various features of IOT Gateways.	**04**
(c)	Discuss the WebSocket and REST based communication protocols.	**07**
Q.4 (a)	Elaborate the functions of each Protocol layer of networked system, also list out protocols present at each layer.	**03**
(b)	Elaborate BLE protocol	**04**
(c)	Apply a single bus communication protocol for DHT11 sensor communication with Arduino.	**07**

OR

Q.4 (a)	Discuss IP Protocol in details	**03**
(b)	Explain HTTP Protocol in detail.	**04**
(c)	Discuss MQTT Protocol	**07**
Q.5 (a)	Draw the Security Architecture of IOT System.	**03**
(b)	Classify the IOT systems based on their applications.	**04**
(c)	Design any one of the possible applications of ultrasonic sensor based embedded system used in Military field.	**07**

OR

Q.5 (a)	Enlist the challenges faced in imposing secured IOT system.	**03**
(b)	What are the goals of security components?	**04**
(c)	It has been decided that the conventional street lights and highway lights providing lightening to the vehicles and public must now be transformed into solar power based for implementing smart city concept, for it to be implemented it is required that these lightening must be turned ON or OFF on its own as the Night darkness fall upon. Design an embedded system for implementing the same using Photo Diode Light Sensor.	**07**

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