Enrollment No.: _____

Darshan Institute of Engineering & Technology
B.Tech. | Sem-6 | Summer-2025

Course Code	:	2101CS631	**Date**	:	17-04-2025
Course Name	:	Internet of Things	**Duration**	:	150 Minutes
			Total Marks	:	70

Instructions:
1. Attempt all the questions.
2. Figures to the right indicates maximum marks.
3. Make suitable assumptions wherever necessary.

Q.1	**(A)**	Explain the IoT stack with a neat diagram and appropriate examples for each layer.	**4**
	(B)	Define 'things' in IoT and provide relevant examples.	**3**
		OR	
		Compare Bluetooth and ZigBee protocols.	
	(C)	Explain the classification of IoT levels from Level 1 to Level 5.	**7**
		OR	
		Explain WSN (Wireless Sensor Networks) in brief.	
Q.2	**(A)**	Describe the pin configuration of Arduino UNO with a labeled block diagram.	**4**
	(B)	Explain the code structure of a basic Arduino program.	**3**
		OR	
		Write a Python program to blink an LED using Raspberry Pi.	
	(C)	Explain the functionalities of the following key Arduino functions with syntax and examples: 1) Serial.print() 2) Serial.begin() 3) digitalWrite() and digitalRead() 4) analogWrite() and analogRead() 5) delay() 6) millis() 7) map()	**7**
		OR	
		Explain the Raspberry Pi and describe the functionalities of its GPIO pins.	
Q.3	**(A)**	Explain asynchronous serial communication using UART.	**4**
	(B)	Write an Arduino program to measure ambient light intensity using an LDR sensor.	**3**

OR

Explain the working principles of the Heart beat measurement sensor.

(C) Explain MQTT protocol in detail. **7**

OR

Explain synchronous serial communication using SPI or I2C protocol.

Q.4 **(A)** Describe the working principles and pin configurations of relay modules and servo motors. **4**

(B) Write an Arduino code for the interfacing of Bluetooth module with Arduino. **3**

OR

Write an Arduino program to control a Stepper Motor (200 steps/revolution, 60 RPM) using a stepper driver module.

(C) Write an Arduino code to turn on the bulb if measured distance is less than 15cm. Draw a basic circuit diagram for connections. **7**

OR

Write an Arduino code to turn on/off the water pump according to the moisture level of soil. Draw a basic circuit diagram for connections.

Q.5 **(A)** Explain Cloud Computing and its relevance to IoT. **4**

(B) What are the benefits of Fog Computing? **3**

OR

Explain Blynk.virtualWrite() and BLYNK_WRITE() functions with respect to Blynk IoT cloud.

(C) Explain the common architecture of an IoT application with a suitable example. **7**

OR

Describe the architecture of a HealthCare IoT application.

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