Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 11-10-2025 **Time:** 09.30am to 11.00am

School: SOCSE	**Program:** B.Tech	
Course Code : CSE2276	**Course Name:** Introduction to IoT	
Semester: V	**Max Marks**:50	**Weightage**:25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**26**	**24**			

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **5Q x 2M=10M**

1	List any four domain specific applications in IoT with examples.	**2 Marks**	**L1**	**CO1**
2	Identify one real-world IoT application that commonly uses **Exclusive pair communication model**.	**2 Marks**	**L1**	**CO1**
3	State the characteristics of 6LOWPAN protocol in IoT.	**2 Marks**	**L1**	**CO2**
4	Differentiate between Bluetooth and Zigbee(any two).	**2 Marks**	**L1**	**CO2**
5	Define Logical design of an IoT.	**2 Marks**	**L1**	**CO1**

Part B

Answer the Questions. **Total Marks 40M**

6.	**a.**	A university IoT research lab has been allocated the IP block 30.0.0.0 (Class A). The lab must be divided into 10 equal-sized subnets. i)Determine the new subnet mask ii) What is the network address, usable host range, and broadcast address of the 5th subnet? iii) What is the maximum number of IoT devices that can be configured *per subnet* and total for the 10 subnets (consider only usable hosts)?	**10 Marks**	**L2**	**CO1**
	b.	Illustrate and apply the IoT Level-3 and IoT Level-5 architectures by drawing neat sketches and mapping suitable	**10 Marks**	**L2**	**CO1**

		deployment templates to real-time applications.			
		Or			
7.	**a.**	An IoT-based healthcare system is equipped with Pulse Sensor and DHT22 **temperature and humidity sensor** connected to a Raspberry Pi. The sensor continuously monitors the patients Heart rate,temperature, humidity and sends the data to a cloud server. The system administrator wants to store and analyze this data in both **JSON** and **XML** formats for compatibility with different applications.The sensor reading taken on **7th October 2025 at 11:30 AM** shows: Heart rate=86bpm Temperature = **28.5°C** and Humidity = **65.2%.** i)Represent the above sensor reading in **JSON format** as it would be sent to a cloud API. ii)Represent the same sensor reading in **XML format** for integration with a legacy database system. iii)Compare REST APIs and Web Socket APIs(any four).	**10 Marks**	**L2**	**CO1**
	b.	Explain IoT Level-2 and IoT Level-4 architectures with neat diagram. Identify real-world application that can be mapped to IoT Level 6 architecture.	**10 Marks**	**L2**	**CO1**

8.	**a.**	A soil moisture sensor (short address 0xCAFE) sends data to the gateway node (0xBEEF). Since multi-hop forwarding is required, a Mesh Addressing Header is added with Hops Left = 5. The Mesh header is: B5 CA FE BE EF i)Explain the Dispatcher and Mesh Addressing Header ii)Decode the header fields. iii)Show how the Hops Left value changes as the packet travels through intermediate nodes.	**10 Marks**	**L3**	**CO2**
	b.	Explicate how Bluetooth Module HC-05 is connected tp Arduino UNO R3. Develop an arduino program to demonstrate to control an LED using Bluetooth HC05 and Bluetooth App. Display the suitable messages on the serial monitor.	**10 Marks**	**L3**	**CO2**
		Or			
9.	**a.**	Apply your knowledge of 6LoWPAN by identifying and demonstrating the use of different header types with suitable real-time examples. Explain in detail its header formats.	**10 Marks**	**L3**	**CO2**
	b.	Use your knowledge of Zigbee architecture to illustrate its components in a practical IoT application, and apply this understanding to compare Zigbee and Bluetooth in terms of their suitability for a specific IoT deployment scenario.	**10 Marks**	**L3**	**CO2**