Roll No.											

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 11 – 12- 2025 **Time:** 01:00pm – 04:00pm

School: SOCSE	**Program:** B.Tech	
Course Code: CIT2504	**Course Name:** AI and Deep Learning for IoT	
Semester: VII	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4
Marks	25	25	25	25

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. 10Q x 2M=20M

1.	List two major benefits of the AIoT concept.	2 Marks	L1	CO1
2.	Explain the difference between AI's Reasoning and IoT's Data Collection capabilities.	2 Marks	L2	CO1
3.	Define the Latency factor as it relates to network communication in AIoT.	2 Marks	L1	CO2
4.	What is a Demilitarized Zone (DMZ) in the context of network security (Gateway)?	2 Marks	L2	CO2
5.	Define Sensor Sensitivity.	2 Marks	L1	CO3
6.	What is the purpose of Amplification in the signal conditioning process?	2 Marks	L2	CO3
7.	What is a major advantage of Cloud AI over Edge AI in terms of complexity?	2 Marks	L2	CO4
8.	List one AIoT application in the Retail sector.	2 Marks	L1	CO4

9.	List two major Challenges and Risks in implementing AIoT systems.	2 Marks	L2	CO1
10.	State the relationship between Precision and Reproducibility for a sensor measurement.	2 Marks	L2	CO3

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Describe the typical three-layer architecture of a modern AIoT system, illustrating the specific roles of the Sensor, Gateway, and Cloud/Edge layer.	**10 Marks**	**L3**	**CO1**
	b.	Explain the steps involved in establishing a connection using Bluetooth Low Energy (BLE) Provisioning and give a practical use case for this method.	**10 Marks**	**L3**	**CO2**
Or					
12.	**a.**	Explain the functions of two digital communication protocols: SPI and UART. Describe a scenario where one would be preferred over the other for a sensor interface.	**10 Marks**	**L3**	**CO3**
	b.	Compare Edge AI and Cloud AI based on two factors: Cost and Data Privacy. Explain which deployment option is better for a security camera.	**10 Marks**	**L4**	**CO4**

13.	**a.**	Explain the difference between AI (Artificial Intelligence) and IoT (Internet of Things), highlighting how they are complementary in the AIoT domain.	**10 Marks**	**L2**	**CO1**
	b.	Explain why Bandwidth Reduction and Security Enhancement are two critical functional requirements for an IoT Gateway.	**10 Marks**	**L2**	**CO2**
Or					
14.	**a.**	Describe the functions of the three main steps in the Signal Conditioning process: Amplification, Filtering, and Analog-to-Digital Conversion (ADC).	**10 Marks**	**L4**	**CO3**
	b.	Outline a simple development plan for an IoT-based Air Quality Monitoring system, covering the choice of sensor, microcontroller, and the use of the data for pattern detection.	**10 Marks**	**L3**	**CO4**

15.	**a.**	Explain and compare the four fundamental Sensor Characteristics: Accuracy, Precision, Sensitivity, and Range.	**10 Marks**	**L4**	**CO3**
	b.	Explain the necessity of Protocol Conversion at the IoT Gateway, providing a specific example of protocols involved.	**10 Marks**	**L3**	**CO2**
Or					

16.	**a.**	Describe how the integration of AI enables an IoT system to achieve two of the following: Predictive Maintenance and Personalization.	**10 Marks**	**L2**	**CO1**
	b.	Using the application of Predictive Maintenance, analyze the need for an Edge AI component to make real-time decisions without reliance on the cloud.	**10 Marks**	**L4**	**CO4**

17.	**a.**	Describe the working principle and a key application for the following three sensors: LDR (Light Dependent Resistor), Gyroscope, and Sound Sensor.	**10 Marks**	**L3**	**CO3**
	b.	Analyze the advantages of the MQTT protocol's lightweight nature (minimal header overhead) and Publish-Subscribe Model for managing a large number of IoT devices.	**10 Marks**	**L4**	**CO2**
		Or			
18.	**a.**	Outline the steps to conduct a practical experiment on Obstacle Detection using an Ultrasonic Sensor and a Buzzer.	**10 Marks**	**L3**	**CO4**
	b.	Explain the relationship between Intelligent Automation (a benefit of AIoT) and the Interoperability (a challenge) of AIoT implementation.	**10 Marks**	**L3**	**CO1**