PRESIDENCY UNIVERSITY
BENGALURU

School Of Computer Science and Engineering & Information Science

End-Term Examinations, Aug 2024

Odd Semester: 2023 - 24

Course Code: CSE6006

Course Name: AI in Internet of Things

Department: M.TECH - AI

Date: 14/08/2024

Time: 09.30am to 12.30pm

Max Marks: 100

Weightage: 50%

Instructions:

(i) *Read the all questions carefully and answer accordingly.*

(ii) *Do not write any matter on the question paper other than roll number.*

Q. No		Questions	Marks	CO	RBT
1	a.	Explain the key components, applications, and the significance of AI in modern technology.	4	CO1	L2
	b.	What are the key features of deep learning models, and how do they differ from traditional machine learning algorithms?	6	CO1	L1
	c.	Describe the fundamental concepts of Machine Learning (ML). What are the main types of ML algorithms, and how do they differ in terms of learning and prediction?	10	CO1	L1
OR					
2	a.	What are the main sources of uncertainty in AI, and how do AI systems handle uncertain information?	4	CO1	L1
	b.	Explain Genetic Algorithms (GAs) and their role in optimization problems. How do GAs mimic natural selection to find solutions?	6	CO1	L2
	c.	Explain the basics of Python programming and its relevance to AI development. How does Python support AI and ML applications?	10	CO1	L2
3	a.	Compare and contrast microprocessors and microcontrollers.	4	CO2	L2
	b.	Describe the key components, applications, and the role of IoT in modern technology.	6	CO2	L2
	c.	What are transducers and sensors? Explain the various types of transducers and sensors, including their applications and how they are used in different contexts.	10	CO2	L1
OR					
4	a.	What are the primary features of Arduino boards that make them suitable for prototyping and development?	4	CO2	L1
	b.	Define microcontrollers and explain their role in IoT systems. How do microcontrollers contribute to the functionality of IoT devices?	6	CO2	L1
	c.	How do you program an Arduino? Describe the key components of the Arduino programming language. What techniques are available for implementing timing functions in Arduino projects?	10	CO2	L1

5	a.	Explore the application of AI in predictive and proactive maintenance scheduling for sensors.	4	CO3	L2
	b.	How do queuing models optimize data processing and communication in sensor systems?	6	CO3	L1
	c.	Outline the role of data clustering algorithms in sensor networks. How do clustering techniques contribute to data organization and pattern recognition in sensor data?	10	CO3	L2

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6	a.	Discuss energy-efficient scheduling techniques for sensors using AI algorithms. How do these techniques contribute to extending the battery life of sensor networks?	4	CO3	L3
	b.	Discuss the role of AI algorithms in enhancing sensor functionality and data accuracy in sensor systems.	6	CO3	L2
	c.	Identify the role of AI in project scheduling and assembly line balancing. How do AI algorithms enhance scheduling and optimization in manufacturing and production environments?	10	CO3	L3

7	a.	How does 6LoWPAN enable IPv6 communication over low-power wireless networks?	4	CO4	L1
	b.	Compare and contrast the Message Queue Telemetry Transport protocol with the Constrained Application Protocol. What are the primary differences in their design?	6	CO4	L2
	c.	Discuss the role of NFC and RFID technologies in IoT. What are the primary differences between these technologies, and how are they used in various IoT applications?	10	CO4	L3

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8	a.	Discuss the strengths and limitations of Zigbee and Bluetooth.	4	CO4	L2
	b.	Explain the functions and responsibilities of each layer within the Bluetooth protocol stack, and discuss how they contribute to Bluetooth communication.	6	CO4	L2
	c.	Explain the working principles of the Message Queue Telemetry Transport (MQTT) protocol. How is MQTT particularly suited for IoT applications?	10	CO4	L2

9	a.	How do stochastic models handle uncertainties and variations in sensor data?	4	CO3	L1
	b.	Identify the use of evolutionary algorithms in sensor-based systems.	6	CO3	L3
	c.	Describe the various ways in which AI is integrated with IoT to enhance a specific application of your choice. Provide detailed examples to support your explanation.	10	CO4	L2

<div align="center">OR</div>

10	a.	How does Zigbee ensure reliable communication in low-power and low-data-rate environments?	4	CO4	L1
	b.	Discuss the role of the Advanced Message Queuing Protocol (AMQP) in IoT applications. What are its key features and how does it ensure reliable message delivery?	6	CO4	L2
	c.	Discuss the application of classification algorithms in sensor data analysis. How do classification algorithms improve the performance of sensors in IoT?	10	CO3	L3