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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**

Branch: Institutional Elective **Duration: 3 hrs.**

Course Code: 23EE6OE1IT / 22EE6OE1IT **Max Marks: 100**

Course: IoT and applications

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	*CO*	*PO*	Marks
1	a)	Define IoT. Describe how an IoT Platform supports IoT applications.	*CO1*	*PO1*	**05**
	b)	Explain about the security challenges in IoT?	*CO1*	*PO1*	**05**
	c)	Explain the role of smart lighting, appliances, and intrusion detection in home automation.	*CO2*	*PO6*	**05**
	d)	Describe the importance of predictive maintenance and air quality monitoring in industrial environments.	*CO2*	*PO6*	**05**
		OR			
2	a)	Explain the significance of key IoT characteristics such as connectivity, scalability, and interoperability.	*CO1*	*PO1*	**05**
	b)	Describe why deployment poses a challenge in IoT environments.	*CO1*	*PO1*	**05**
	c)	How would you apply IoT to implement smart parking and smart roads in a metropolitan area?	*CO2*	*PO6*	**05**
	d)	Demonstrate how IoT can be used to collect data in Energy Systems.	*CO2*	*PO6*	**05**
		UNIT - II			
3	a)	Define Sensor and Actuator. What is the sensor features to choose sensors for a smart home?	*CO3*	*PO2*	**05**
	b)	Write a short note on analog and digital sensors in IoT systems.	*CO3*	*PO2*	**05**
	c)	Differentiate between Internet of Things and Wireless Sensor Networks	*CO3*	*PO2*	**05**
	d)	What is Pneumatic Actuator? Mention its advantages, disadvantages and applications.	*CO3*	*PO2*	**05**
		OR			
4	a)	With an example, assess the impact of sensor-actuator interaction in IoT systems to effectively optimize system performance.	*CO3*	*PO2*	**05**

		b)	List the key characteristics of sensors used in IoT.	*CO3*	*PO2*	**05**
		c)	Classify and Write a short note on sensors based on its output.	*CO3*	*PO2*	**05**
		d)	Illustrate a block diagram of a WSN and mention the function its components.	*CO3*	*PO2*	**05**
			UNIT - III			
	5	a)	Explain the function of each layer in the IP-based IoT model.	*CO4*	*PO5*	**05**
		b)	Illustrate the cross-sectional diagram of a coaxial cable with labeled parts, and explain how such cables were used in early Ethernet setups like 10BASE5.	*CO4*	*PO5*	**05**
		c)	Explain the role of each component in a LoRa network.	*CO4*	*PO5*	**05**
		d)	Explain the main differences between Zigbee and Bluetooth.	*CO4*	*PO5*	**05**
			OR			
	6	a)	What is IoT Protocols? Working of internet protocol. Why do we need IoT protocols?	*CO4*	*PO5*	**05**
		b)	Analyze the role of each field in the IEEE 802.3 frame format.	*CO4*	*PO5*	**05**
		c)	What are the key features of Bluetooth. Explain the architecture of Bluetooth along with a neat schematic?	*CO4*	*PO5*	**05**
		d)	Describe how Zigbee differs from Wi-Fi in terms of network architecture and usage.	*CO4*	*PO5*	**05**
			UNIT - IV			
	7	a)	Illustrate the MQTT model with a simple example.	*CO4*	*PO5*	**05**
		b)	What is CoAP? List the key features of CoAP.	*CO4*	*PO5*	**05**
		c)	Describe the Confirmable, Non-confirmable, Acknowledgement, and Reset messages in CoAP.	*CO4*	*PO5*	**05**
		d)	Explain the significance of block-wise transfers that are used in CoAP.	*CO4*	*PO5*	**05**
			OR			
	8	a)	Explain the role of an MQTT broker in the MQTT communication model.	*CO4*	*PO5*	**05**
		b)	Explain how MQTT ensures message delivery reliability at each QoS level.	*CO4*	*PO5*	**05**
		c)	Differentiate between CoAP and MQTT.	*CO4*	*PO5*	**05**
		d)	Explain how HTTP/CoAP proxying enables communication between web-based and IoT-based devices.	*CO4*	*PO5*	**05**
			UNIT - V			
	9	a)	Explain the concept of cloud computing.	*CO5*	*PO1*	**05**
		b)	Explain how IoT analytics is used in a Building Automation and smart agriculture use case.	*CO5*	*PO3*	**05**
		c)	What are the different ways in which cloud is deployed. Explain any one in detail.	*CO5*	*PO5*	**05**

		d)	Explain the main differences between PAAS and IAAS.	*CO5*	*PO5*	**05**
			OR			
	10	a)	Illustrate how Fog Computing architecture supports an IoT applications.	*CO5*	*PO1*	**05**
		b)	Explain how IoT analytics is used in a Health care and Energy Management use case.	*CO5*	*PO3*	**05**
		c)	Explain each type of data analysis result with examples	*CO5*	*PO5*	**05**
		d)	Explain the main differences between PAAS and FAAS.	*CO5*	*PO5*	**05**

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