Reg.No.: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5029

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE / JULY 2024
Second Semester
Computer Science and Engineering
P23CSE04 – INTERNET OF THINGS
(Regulation 2023)

Time: Three Hours   Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define IoT and explain its significance in today's technological landscape.	2	K2	CO2
2.	Define M2M communication.	2	K2	CO2
3.	What is the significance of the M2M high-level ETSI architecture in IoT development?	2	K4	CO1
4.	Explain the concept of IoT reference architecture.	2	K4	CO1
5.	Write the purpose of BACNet protocol in IoT applications.	2	K3	CO4
6.	What is the role of Modbus protocol in IoT communication?	2	K3	CO4
7.	Name the building blocks of an IoT device compatible with Raspberry Pi.	2	K3	CO3
8.	What type of IoT device is the Raspberry Pi?	2	K3	CO3
9.	How does participatory sensing contribute to IoT applications in smart cities?	2	K4	CO5
10.	How does Amazon Web Services (AWS) support IoT applications?	2	K4	CO5

PART – B

Q.No.			Questions	Marks	KL	CO
11.	a)		What is M2M communication? Justify the statement with an illustrative scenario: "IoT is much more than M2M communication".	13	K4	CO2
			(OR)			
	b)	i.	Explain physical design of IoT with suitable diagram.	6+7	K4	CO2
		ii.	Which are the layers of the core IoT functional stack?			
12.	a)	i.	What is the significance of the M2M high-level ETSI architecture in IoT development?	13	K4	CO1
		ii.	Discuss the communication model in IoT reference architecture. How does it facilitate seamless data exchange between IoT devices?			
			(OR)			
	b)	i.	Explain the concept of IoT reference architecture and its components.	6+7	K4	CO1
		ii.	Design an IoT reference model for a smart agriculture system, considering various sensors and actuators involved. Justify your design choices.			
13.	a)	i.	Explain the architecture of Zigbee and its role in enabling low-power, low-data-rate wireless IoT networks.	8+5	K3	CO4
		ii.	What is the difference between 802.15 4 and ZigBee?			
			(OR)			
	b)		Critically evaluate the role of 6LowPAN in enabling IPv6 connectivity for IoT devices in constrained networks. Discuss its impact on IoT deployment scalability and interoperability.	13	K3	CO4
14.	a)	i.	Explain how Aurdino helps to develop IoT applications.	6+7	K3	CO3
		ii.	Explain Interfaces and Rasberry pi with C/python language.			
			(OR)			
	b)	i.	Design a simple IoT system using Raspberry Pi as the central controller. Include at least two IoT devices and describe their functionalities.	6+7	K3	CO3
		ii.	When Arduino program runs which function executes first? Explain with suitable example.			

15.	a)	Design an IoT-based asset management system for a manufacturing facility. Consider factors such as asset tracking, predictive maintenance, and inventory optimization. Justify your design choices.	13	K4	CO5

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

	b)	i.	What is the difference between industrial automation and commercial building automation systems?	6+7	K4	CO5
		ii.	Evaluate the scalability and performance of cloud storage models for storing and analyzing large volumes of IoT data. Discuss the trade-offs between centralized and edge-based storage architectures.			

<div align="center">PART – C</div>

<div align="right">(1 x 15 = 15 Marks)</div>

Q.No.	Questions	Marks	KL	CO
16. a)	Based on the case study scenario provided, outline your approach to designing and implementing the IoT protocol framework for the smart agriculture system. Discuss the device selection criteria, protocol choices, integration strategy, security measures, and scalability considerations. Additionally, identify potential challenges and mitigation strategies associated with deploying IoT in agricultural environments. Provide recommendations for ensuring the success and sustainability of the IoT implementation.	15	K3	CO5

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

	b)	i.	Name and explain two building blocks essential for constructing IoT devices with Raspberry Pi.	15	K3	CO3
		ii.	Develop a Python-based application for real-time data visualization and analysis in an IoT environment using Raspberry Pi. Discuss the design considerations and potential use cases.			