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: 50025

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2024
Fifth Semester
Electrical and Electronics Engineering
U19CSOE1 – INTRODUCTION TO IoT
(Common to BT & BME)
(Regulation 2019)

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.	What is a "connected device" in the context of web thinking?	2	K2	CO1
2.	Name any two protocols that supports device interoperability in IoT.	2	K2	CO1
3.	Among the 'Arduino' and 'Raspberry Pi' boards, investigate which one is the best platform to develop a home automation system?	2	K3	CO2
4.	A smart agriculture system is implemented to monitor and manage the environmental conditions inside a greenhouse. Elucidate the role of sensors and actuators in monitoring and managing the greenhouse environment.	2	K3	CO2
5.	Enunciate the role of edge computing in IoT.	2	K3	CO3
6.	Draw a neat sketch of the edge architectural model in Internet of Things.	2	K3	CO3
7.	List out any four cryptographic methods for securing the IoT applications.	2	K2	CO4
8.	How can constrained devices support secure authentication without impacting their performance significantly?	2	K3	CO4
9.	State the benefits of using the IoT in the retail industries.	2	K2	CO5

10.		List out any two applications of using IoT in the health care sector.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Briefly elaborate the various elements of an IoT ecosystem along with a neat sketch.	13	K2	CO1
		(OR)			
	b)	A cold storage facility uses IoT sensors to monitor temperature, humidity, and other environmental factors crucial for preserving perishable goods. The facility uses MQTT protocol to transmit sensor data to a central monitoring system, which is accessible through a web-based interface. In the context of web thinking, how could the web-based interface be designed to effectively interact with the MQTT-based cold storage monitoring system?	13	K3	CO1
12.	a)	A simple door lock system is designed using an Arduino and a push button. The system should uses a push button to toggle the state of a lock which is represented by an LED. When the button is pressed, the lock toggles between locked (LED on) and unlocked (LED off) states. Write an Arduino sketch to toggle the state of an LED whenever the push button is pressed.	13	K3	CO2
		(OR)			
	b)	An industrial plant is using IoT sensors to monitor the performance of machinery. The goal is to detect anomalies in temperature, vibration, and pressure to prevent equipment failure and reduce the downtime. Detail the types of sensors used, for the anomaly detection inside the industrial plant. Also elaborate on the type of the actions taken based on the alerts issued from the sensor data.	13	K3	CO2
13.	a)	Discuss the benefits and challenges of using Cloud-to-Device communication in IoT applications.	13	K2	CO3
		(OR)			
	b)	Briefly elaborate on the role of edge computing systems in the IoT environment along with an example.	13	K2	CO3
14.	a)	Discuss about the Smarties Approach in IoT and discuss how each element contributes to the development of a robust IoT system.	13	K2	CO4
		(OR)			

	b)	Investigate the trade-offs between security and performance when implementing the access control mechanism in resource constrained devices. Also describe the steps for effective trade off management.	13	K3	CO4
15.	a)	Elaborate on the various pros and cons of the smart factory initiative in IoT.	13	K2	CO5
		(OR)			
	b)	Discuss about the various applications of IoT in industrial automation and smart manufacturing.	13	K2	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Design a real-time object detection system using Raspberry Pi and a camera module. The system should detect objects in the camera feed and display the detection results on a connected monitor. Elaborate on the necessary hardware set up and its relevant functionalities along with a neat circuit diagram.	15	K4	CO2
		(OR)			
	b)	Air pollution is a severe problem that has been affecting the planet earth for several years. Explain how will you construct a IoT based centralized pollution monitoring platform for storing and analyzing the air quality data and take necessary measures to prevent the air pollution.	15	K3	CO5