Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

M.E DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Second Semester

Computer Science and Engineering

CP4291/PCST2421 - Internet of Things

Regulations – 2021/2024

Duration : 3 Hrs ***Maximum : 100 Marks***

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Name two commonly used sensors in smart agriculture.	L1	1	2
2.	What is the purpose of an IoT gateway in a network?	L2	1	2
3.	List two characteristics of the first-generation IoT systems.	L1	2	2
4.	What is the purpose of the IoT reference architecture defined by IETF?	L2	2	2
5.	List the three types of devices in a Zigbee network.	L1	3	2
6.	Why is header compression essential in 6LoWPAN?	L2	3	2
7.	Define IaaS and give one example.	L1	4	2
8.	Differentiate between PaaS and SaaS with an example of each.	L2	4	2
9.	Mention any two sensors that can be interfaced with Raspberry Pi for an IoT project.	L1	5	2
10.	Explain the role of GPIO pins in Raspberry Pi when interacting with hardware sensors.	L2	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a	i	Assess the impact of Healthcare IoT on patient monitoring systems. Discuss its advantages over conventional methods and potential security risks.	L5	1	8
		ii	Propose an IoT architecture for an agricultural drone system. Include sensing, communication, and data processing layers.	L6	1	8
			Or			
	b	i	Discuss the challenges of using wearable sensors in IoT-based healthcare. How can accuracy and power consumption be optimized?	L5	1	8
		ii	Design a YANG model for managing a fleet of IoT-enabled delivery drones. Include configuration parameters and operational states.	L6	1	8

12.	a	i	Analyze the limitations of first-generation IoT in terms of scalability, energy efficiency, and security.	L4	2	10
		i i	How did these limitations influence the development of advanced IoT architectures?	L2	2	6
			Or			
	b	i	Compare traditional standalone sensors with modern integrated IoT sensors in terms of power consumption, data processing, and connectivity options.	L4	2	10
		i i	Explain the key components of the IETF's IoT reference architecture. How do these components interact to support a scalable IoT ecosystem?	L2	2	6
13.	a	i	A manufacturing plant uses RFID for inventory tracking and SCADA for process control. Critically assess the security risks in integrating these two systems. Suggest mitigation strategies.	L5	3	10
		i i	How would you implement a 6LoWPAN-based smart meter system for utility monitoring?	L3	3	6
			Or			
	b	i	Evaluate the role of BACnet's object-oriented model in ensuring interoperability among HVAC, lighting, and security systems. Provide examples.	L5	3	10
		i i	How would you optimize an energy storage module for a solar-powered environmental sensor?	L3	3	6
14.	a	i	Compare and contrast IaaS, PaaS, and SaaS in terms of control, scalability, and user responsibility. Give one real-world use case for each model.	L2	4	8
		i i	Cloud providers like AWS, Azure, and GCP offer different pricing models for IaaS, PaaS, and SaaS**.** Compare their cost structures and discuss which provider would be most cost-effective for a mid-sized company running multiple microservices.	L5	4	8
			Or			
	b	i	Explain how PaaS (Platform as a Service) simplifies application development compared to IaaS (Infrastructure as a Service)**.** Give an example of a PaaS offering from Microsoft Azure and how it benefits developers.	L2	4	8
		i i	Server less computing (PaaS) is becoming popular over traditional IaaS**.** Discuss the pros and cons of using AWS Lambda vs. Azure Virtual Machines for a data processing application**.**	L5	4	8

15.	a	i	Design an IoT project using Raspberry Pi that monitors soil moisture and sends alerts when levels are critical. Outline the hardware components needed, how data will be collected, persisted (stored), and exported to a cloud service. Justify your design choices.	L6	5	10
		i i	You are given a temperature sensor and an LED. Write a Python script using the RPi.GPIO library to turn on the LED when the temperature exceeds 30°C.	L3	5	6
			Or			
	b	i	Propose an IoT-based smart home system using Raspberry Pi that integrates multiple sensors (temperature, motion, light). Explain how data from these sensors will be processed, stored, and exported for remote access via a mobile app. Include a block diagram of the system architecture.	L6	5	10
		i i	A Raspberry Pi is connected to a light-dependent resistor (LDR). Write a code snippet to log light intensity readings into a CSV file every 5 seconds.	L3	5	6