

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Sixth Semester

Electronics and Communication Engineering

ET3491 - Embedded Systems and IOT Design

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

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

Q.No	Questions	BLT	CO	Marks
1.	Outline the key features of the 8051 architecture.	UN	1	2
2.	Differentiate between timers and counter modes in the 8051.	AN	1	2
3.	Outline the stages of the embedded system design process.	UN	2	2
4.	What metrics can be used to evaluate the performance of an embedded program?	RE	2	2
5.	Compare hard and soft real-time systems.	UN	3	2
6.	What is a multirate system in the context of real-time applications?	RE	3	2
7.	Identify the examples of everyday applications of IoT.	AP	4	2
8.	List the key features of MQTT.	UN	4	2
9.	Choose the key components of an IoT device.	EV	5	2
10.	How can Raspberry Pi be used in precision agriculture?	AP	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

Q.No	Questions	BLT	CO	Marks
11.	a Describe the architecture of the 8051 microcontroller.	UN	1	13
	Or			
	b Explain the organization of program memory in the 8051.	UN	1	13
12.	a Analyze the benefits of the ARM pipeline architecture compared to non-pipelined architectures.	AN	2	13
	Or			
	b Analyze the factors that can influence program execution time in an embedded system.	AN	2	13
13.	a Analyze the challenges of managing multiple tasks in a real-time system.	AN	3	13
	Or			
	b Analyze the performance implications of shared memory access patterns.	AN	3	13

14.	a	Assess the trade-offs between physical design and logical design in an IoT project.	EV	4	13
		Or			
	b	Evaluate the performance of modbus in industrial IoT applications.	EV	4	13
15.	a	Illustrate how you would set up a basic IoT device using a sensor and actuator	UN	5	13
		Or			
	b	Discuss the impact of climate monitoring using IoT devices in agriculture.	UN	5	13

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	Design a communication strategy that incorporates multiple IoT protocols for a smart building application.	CR	4	15
		Or			
	b	Design a comprehensive home automation system using Raspberry Pi and various sensors.	CR	5	15