Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL/MAY 2026

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.	List few applications of the 8051 microcontrollers.	L1	1	2
2.	Mention the no of timers available in the 8051 microcontrollers.	L2	1	2
3.	What is the role of RTOS in Embedded Systems?	L2	2	2
4.	Define Performance Analysis in Embedded Systems.	L1	2	2
5.	What are real-time systems and give few examples?	L1	3	2
6.	What is the need of shared memory in multiprocessor?	L2	3	2
7.	Mention two differences between physical and logical design of an IoT.	L1	4	2
8.	Define IoT communication model.	L1	4	2
9.	How sensors are important in an IoT system?	L2	5	2
10.	List few sensors used in a smart agriculture application.	L1	5	2

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

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a	i	Discuss the addressing modes of the 8051 microcontrollers with suitable examples.	L2	1	8
		ii	Discuss the instruction set categories of the 8051 microcontrollers with examples.	L2	1	8
			Or			
	b	i	What is the need of interrupt in controller and also classify the different types of interrupts in 8051.	L2	1	8
		ii	Design a logic and write an assembly language program to generate a square wave using Timer 1 in 8051.	L2	1	8
12.	a	i	Analyze the working principle of a Model Train Controller with clear schematic circuit.	L4	2	8
		ii	How does an embedded system enhance the safety in railway automation?	L4	2	8
			Or			
	b	i	Interpret the concept of Supervisor Mode and its importance in Embedded Systems.	L4	2	10
		ii	Compare the features of Cross-Compilation and Native Compilation.	L4	2	6

13.	a	i	Examine how multiple tasks and processes are handled in an embedded system.	L2	3	8
		ii	Discuss the significance and challenges of multirate processing in real-time applications.	L2	3	8
			Or			
	b	i	Design the architecture of an MPSoC and also discuss its advantages with respect to real-time applications.	L2	3	8
		ii	What is the need of ECU in an automotive application and analyze its features.	L2	3	8
14.	a	i	Compare the various wireless protocols RFID, Bluetooth, and Zigbee which act as enabling technologies for IoT.	L3	4	8
		ii	Analyze the role of IoT in industrial automation and healthcare. Justify which is giving more impact in a commercial application?	L3	4	8
			Or			
	b	i	Construct the CANBUS protocol and its applications in automotive systems.	L3	4	8
		ii	Develop the architecture and use of BACnet protocol in building automation.	L3	4	8
15.	a	i	Compare Raspberry Pi with Arduino for a IoT applications.	L4	5	8
		ii	Interpret commonly used Linux commands for managing an IoT system.	L4	5	8
			Or			
	b	i	Examine a complete IoT-based home automation system with block diagram.	L4	5	8
		ii	Discuss the role of IoT in smart cities with detailed flow structure.	L4	5	8