

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025***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.	What is the role of a microcontroller in embedded systems?	L1	1	2
2.	List any four features of the 8051controller.	L1	1	2
3.	Mention any two steps in the embedded system in a design process.	L1	2	2
4.	What is an exception in ARM?	L2	2	2
5.	How a task is differs from a process of an embedded system?	L2	3	2
6.	State any one real-time requirement of an audio player system.	L1	3	2
7.	Differentiate IoT and M2M.	L2	4	2
8.	What is meant by the physical design of IoT?	L2	4	2
9.	Why is Python a popular programming language for IoT development on Raspberry Pi?	L2	5	2
10.	What are two examples of IoT devices used in home automation systems?	L1	5	2

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

Q.No	Questions	BLT	CO	Marks
11.	a i What is instruction set in a controller and classify the various instruction set used in 8051 with suitable examples.	L2	1	10
	i Design and discuss the use and operation of stacks in 8051.	L2	1	6
	Or			
	b i Sketch the architecture of 8051 microcontroller and compare how it is differing from a processor.	L2	1	10
	i Discuss the working of Counters and special function registers in 8051.	L2	1	6
12.	a i Interpret the complete process of compiling, linking, and loading an embedded application.	L2	2	8
	i Compare User mode and Supervisor mode in Advanced Risc Machines.	L2	2	8

Or

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| | b | i | Analyze the design and implementation of a model train controller using embedded systems. | L2 | 2 | 8 |
| | | i | Discuss the performance analysis of an embedded system application at program level with relevant example. | L2 | 2 | 8 |
| 13. | a | i | Analyze how task assignment and task scheduling is used in real-time systems and also compare its features. | L2 | 3 | 8 |
| | | i | Discuss the inter-process communication mechanisms used in real-time systems. | L2 | 3 | 8 |

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| | b | i | Examine the concept of priority-based scheduling and how it is used in RTOS? | L2 | 3 | 8 |
| | | i | Write short notes on distributed embedded systems and discuss the specific role in modern applications. | L2 | 3 | 8 |
| 14. | a | i | Apply the IoT platform design methodology to develop a smart irrigation system and explain the steps involved in it. | L3 | 4 | 10 |
| | | i | Develop a domain model for an IoT-based wearable health monitoring system with suitable sensors. | L3 | 4 | 6 |
| | | | Or | | | |
| | b | i | Using MQTT, illustrate how data can be collected from temperature sensors and sent to a cloud dashboard and also include a functional block to meet the given requirement. | L3 | 4 | 10 |
| | | i | Construct an IoT system using BACnet for building automation. | L3 | 4 | 6 |

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| 15. | a | | Analyze the differences between using Raspberry Pi and open source hardware in an IoT-based agricultural systems and discuss the pros and cons in terms of processing, interfacing, and programming. | L4 | 5 | 16 |
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Or

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| | b | | Compare and analyze the role of Linux on Raspberry Pi versus other embedded OS options in IoT applications and also evaluate performance, stability, and real-time requirements. | L4 | 5 | 16 |
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