

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code : 91947

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Sixth Semester

Computer Science and Engineering

CS 3691 — EMBEDDED SYSTEMS AND IoT

(Common to : Computer Science and Engineering (Artificial Intelligence and Machine Learning)/Computer and Communication Engineering/Artificial Intelligence and Data Science)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Compare Microprocessor and Microcontroller.
2. Sketch the TMOD table of 8051 for timer operation.
3. Define embedded systems.
4. Write an 8051 embedded C program to toggle P1.0.
5. Compare IoT Devices and Computers.
6. List any two basic Components of IoT.
7. Compare IoT Things and M2M machines.
8. Develop a raspberry pi-based python script to toggle LED for every 10 ms.
9. Write any two important features of home automations.
10. State the scope of developing IoT applications in public services and smart cities.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the 8051 architecture with neat block diagram.

Or

- (b) Illustrate in detail about timer/counter operations of 8051 microcontroller.

12. (a) Explain the importance of Memory And I/O Devices Interfacing.

Or

- (b) Consider the following set of processes (Table 1) with a length of CPU arrival and burst time given in milliseconds.

Table 1

Process (P)	Arrival Time	Service Time
P1	0	3
P2	2	6
P3	4	4
P4	6	5
P5	8	2

Apply the Gantt chart that illustrates the execution of these processes using the Round robin scheduling algorithm with the time quantum of 4ms and also calculate the average waiting time and turnaround time for the given processes.

13. (a) Explain in detail about the Arduino Programming Structure.

Or

- (b) Illustrate an example of IoT Integration with Sensors and Actuators using Arduino.

14. (a) Explain the working of IoT Communication Models and APIs with neat sketch.

Or

- (b) Model an automatic refrigerator light system with LED, switch using raspberry pi hardware module and write a python program to support the working of that design.

-
15. (a) Discuss the importance of development in IoT Applications.

Or

- (b) Explain in detail the design methodology used to implement IoT devices, explain the level wise design steps with neat diagram.

PART C — ($1 \times 15 = 15$ marks)

16. (a) Explain how IoT technology is impacting the home automation process.

Or

- (b) Explain the system design of smart city for IoT technology.
-

