



**DIPLOMA IN ARTIFICIAL INTELLIGENCE
AND MACHINE LEARNING**

CENTRALIZED QUESTION BANK

**1056234540- EMBEDDED SYSTEM AND INTERNET OF
THINGS (IOT)**

**DIRECTORATE OF TECHNICAL
EDUCATION GOVERNMENT OF
TAMILNADU**

DIPLOMA END SEMESTER /YEAR EXAMINATION-2025

Course: Artificial Intelligence and Machine Learning

Subject: Embedded System and Internet of Things (IOT)

QP Code: 1056234540

Time: 3 Hours

Date: Session:

Max Marks: 100

Answer the Following Questions

1. A) Install the necessary development tools and software for programming ARM-based microcontrollers. This might include installing Keil μ Vision, STM32CubeIDE, or other IDEs recommended by the microcontroller manufacturer.
 B) Test the effectiveness of IoT-enabled predictive maintenance strategies in industrial equipment.

2. A) (a) Write assembly language program for addition, subtraction and Multiplication and simulate.
 (b) Write code to control the LEDs (e.g., blinking patterns) and read input from the push button.
 B) Create a basic smart home system by connecting IoT devices such as smart bulbs, smart switches, and motion sensors to a central hub.

3. A) (a) Write and execute C program for serial transmission and reception using on chip UART. Send the received character back to the PC by Interrupt method.
 (b) Write and execute C program for serial transmission and reception using on chip UART. Send the received character back to the PC by Polling method.
 B) Build a simple IoT device using a temperature and humidity sensor (e.g., DHT11 or DHT22) connected to a microcontroller (e.g., Arduino or Raspberry Pi).

4. A) (a) Write and execute C program for accessing an internal ADC and display the binary output in LEDs.
 (b) Write and execute C program to generate square wave using on chip DAC.
 B) Test the effectiveness of IoT-enabled predictive maintenance strategies in industrial equipment.

5. A) Install the necessary development tools and software for programming ARM-based microcontrollers. This might include installing Keil μ Vision, STM32CubeIDE, or other IDEs recommended by the microcontroller manufacturer.
 B) Build a simple IoT device using a temperature and humidity sensor (e.g., DHT11 or DHT22) connected to a microcontroller (e.g., Arduino or Raspberry Pi).

6. A) (a) Write and execute C program for accessing an internal ADC and display the binary output in LEDs.
(b) Write and execute C program to generate square wave using on chip DAC.
B) Test the effectiveness of secure firm ware update mechanisms for ensuring the integrity and authenticity of firmware updates in IoT devices.
7. A) (a) Write assembly language program for addition, subtraction and Multiplication and simulate.
(b) Write code to control the LEDs (e.g., blinking patterns) and read input from the push button.
B) Test the effectiveness of secure firmware update mechanisms for ensuring the integrity and authenticity of firmware updates in IoT devices.
8. A) (a) Write and execute C program for serial transmission and reception using on chip UART. Send the received character back to the PC by Interrupt method.
(b) Write and execute C program for serial transmission and reception using on chip UART. Send the received character back to the PC by Polling method.
B) Create a basic smart home system by connecting IoT devices such as smart bulbs, smart switches, and motion sensors to a central hub.
9. A) (a) Write and execute C program for accessing an internal ADC and display the binary output in LEDs.
(b) Write and execute C program to generate square wave using on chip DAC.
B) Create a basic smart home system by connecting IoT devices such as smart bulbs, smart switches, and motion sensors to a central hub.
10. A) (a) Write assembly language program for addition, subtraction and Multiplication and simulate.
(b) Write code to control the LEDs (e.g., blinking patterns) and read input from the push button.
B) Test the effectiveness of IoT-enabled predictive maintenance strategies in industrial equipment.
11. A) (a) Write and execute C program for serial transmission and reception using on chip UART. Send the received character back to the PC by Interrupt method.
(b) Write and execute C program for serial transmission and reception using on chip UART. Send the received character back to the PC by Polling method.
B) Test the effectiveness of secure firmware update mechanisms for ensuring the

integrity and authenticity of firmware updates in IoT devices.

12. A) Install the necessary development tools and software for programming ARM-based microcontrollers. This might include installing Keil μ Vision, STM32CubeIDE, or other IDEs recommended by the microcontroller manufacturer.
B) Create a basic smart home system by connecting IoT devices such as smart bulbs, smart switches, and motion sensors to a central hub.
13. A) (a) Write and execute C program for accessing an internal ADC and display the binary output in LEDs.
(b) Write and execute C program to generate square wave using on chip DAC.
B) Build a simple IoT device using a temperature and humidity sensor (e.g., DHT11 or DHT22) connected to a microcontroller (e.g., Arduino or Raspberry Pi).
14. A) (a) Write assembly language program for addition, subtraction and Multiplication and simulate.
(b) Write code to control the LEDs (e.g., blinking patterns) and read input from the push button.
B) Build a simple IoT device using a temperature and humidity sensor (e.g., DHT11 or DHT22) connected to a microcontroller (e.g., Arduino or Raspberry Pi).
15. A) (a) Write and execute C program for serial transmission and reception using on chip UART. Send the received character back to the PC by Interrupt method.
(b) Write and execute C program for serial transmission and reception using on chip UART. Send the received character back to the PC by Polling method
B) Test the effectiveness of IoT-enabled predictive maintenance strategies in industrial equipment.
16. A) Install the necessary development tools and software for programming ARM-based microcontrollers. This might include installing Keil μ Vision, STM32CubeIDE, or other IDEs recommended by the microcontroller manufacturer.
B) Test the effectiveness of secure firmware update mechanisms for ensuring the integrity and authenticity of firmware updates in IoT devices.

Allocation Of Marks

S.No	Description	Marks
1	Aim(05 Program from Part A (30)	35
2	Aim(05) Program from Part B(30)	35
3	Executing any one program(Part A or Part B)	15
4	Output	10
5	VivaVoce	5
TOTAL		100