Reg. No. : | | | | | | | | | | | | |

Question Paper Code: R4I06

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Fourth semester

CSE (Internet of things)

R21UIO406 - PROGRAMMING LANGUAGE FOR IOT

(Regulations R2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART - A (10 x 2 = 20 Marks)

1.	Explain the process of downloading an operating system for Raspberry Pi.	CO1- U
2.	Outline on recommended operating systems for the Raspberry Pi?	CO1- U
3.	Outline on lists and list methods in Python?	CO1- U
4.	Develop a python program to remove an item from a list by using index value.	CO2-App
5.	Explain the implications of using GPIO.cleanup() at the end of a Python script?	CO1- U
6.	Infer, how could you use the GPIO pins to control an external device like a motor?	CO1- U
7.	Compare IaaS, PaaS, and SaaS in the context of IoT?	CO1- U
8.	Explain the concept of cloud storage models in IoT and their importance.	CO1- U
9.	Summarize the common programming languages used for IoT development on Raspberry Pi.	CO1- U
10.	Configure a Node-RED flow to send data from Raspberry Pi to a cloud platform?	CO2-App

PART – B (5 x 16= 80 Marks)

11.	(a)	Explain the boot process of the Raspberry Pi 3 and how it loads the operating system from the SD card? Additionally, What are the common boot issues encountered when using the Raspberry Pi in IoT projects?	CO1- U	(16)
		Or		
	(b)	Explain the basics of Linux and how to navigate the Linux environment in Raspberry Pi.Describe the graphic user interface used in Raspian Linux distribution.	CO1- U	(16)

12.	(a)	Develop a Python program for an IoT weather station on Raspberry Pi to collect and process temperature and humidity data. Use functions(Expression, String)for modularity and explain how you would handle errors during data collection.	CO2- App	(16)
		Or		
	(b)	Implement a Python program on Raspberry Pi to control an external device (e.g., LED, motor, or sensor).Use lists and list methods to manage device states or control sequences within your program. Demonstrate how the program works, and explain how lists are used in the context of your IoT application.	CO2- App	(16)
13.	(a)	Interface a temperature sensor (e.g., LM35) with the Raspberry Pi using GPIO pins. Write a Python program to read the sensor's data and display the temperature. Demonstrate the program working and explain how the GPIO pins are used to interface with the sensor.	CO2- App	(16)
		Or		
	(b)	You are tasked with controlling a DC motor using Raspberry Pi. Write a Python program using the RPi.GPIO library to adjust the motor's speed using PWM. Describe the steps you took to ensure the motor operates at the correct speed.	CO2- App	(16)
14.	(a)	Compare and contrast the use of private clouds, public clouds, and hybrid clouds in the context of IoT systems. Which cloud model would you recommend for an IoT solution and why?	CO1- U	(16)
		Or		
	(b)	Explain the principles of REST (Representational State Transfer) and how they are applied to design scalable and efficient APIs for IoT applications. Discuss the significance of statelessness, cacheability, and uniform interfaces.	CO1- U	(16)
15.	(a)	Develop a home automation system using Raspberry Pi that controls lights and appliances remotely.	CO2- App	(16)
		Or		
	(b)	Implement secure MQTT communication with authentication and encryption for IoT devices.	CO2- App	(16)