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Question Paper Code: R4I06

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 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)

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|---|---------|
| 1. Summarize on Raspberry Pi, and what are its common uses in IoT? | CO1- U |
| 2. Outline the primary components of a Raspberry Pi 3. | CO1- U |
| 3. Summarize the key components required to interface hardware with the Raspberry Pi. | CO1- U |
| 4. Summarize the purpose of lists in Python, and how are they created. | CO1- U |
| 5. Outline the role of the GPIO.cleanup() function. Why is it important? | CO1- U |
| 6. Develop an LED blink program using GPIO pins. | CO2-App |
| 7. Infer the key components of an IoT physical server. | CO1- U |
| 8. Summarize the advantages of using cloud offerings IoT applications. | CO1- U |
| 9. Summarize the key components needed to design an IoT system using Raspberry Pi. | CO1- U |
| 10. Explain the role of Raspberry Pi in IoT applications | CO1- U |

PART – B (5 x 16= 80 Marks)

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|---|--------|------|
| 11. (a) Explain the fundamentals of Raspberry Pi, including its hardware and software components. Describe its role in IoT applications. | CO1- U | (16) |
| Or | | |
| (b) For a Raspberry Pi project involving home automation or IoT applications, how do the graphical user interface (GUI) and the terminal differ in terms of usability and efficiency? | CO1- U | (16) |

12. (a) Imagine you are tasked with developing a basic IoT system using a Raspberry Pi to monitor temperature. Walk through the process of implementing the system using Python. How would you use functions to handle sensor data collection, processing, and communication? CO2- App (16)
- Or
- (b) Develop a Python program that uses control flow (e.g., if statements, loops) to monitor and respond to sensor input (e.g., turning on a fan when the temperature exceeds a threshold). Describe how you would structure the code and handle potential errors in the sensor input. CO2- App (16)
13. (a) Set up a Raspberry Pi to control lights and fans using its GPIO pins. Write and implement a Python program to turn the devices on and off based on user input or conditions. Demonstrate the home automation system and explain how the GPIO pins are used to control the devices. CO2- App (16)
- Or
- (b) Develop a Python program that uses a Raspberry Pi's GPIO pins to control a simple traffic light system with three LEDs (red, yellow, green). Describe how you would simulate the traffic light cycle and provide the Python code for the solution. CO2- App (16)
14. (a) Explain the role of physical IoT servers in the cloud ecosystem. How do physical servers differ from virtualized servers in IoT applications? CO1- U (16)
- Or
- (b) Explain the steps involved in connecting an IoT device to a RESTful API to send sensor data. Discuss the role of headers, authentication tokens, and response handling. CO1- U (16)
15. (a) Develop a Python-based program to read and display sensor data on an LCD screen. CO2- App (16)
- Or
- (b) Design a Node-RED flow to collect temperature and humidity sensor data. CO2- App (16)