

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

B.Tech-III Semester (IT)

COURSE CODE (CREDITS): 18B11CI315 (3)

MAX. MARKS: 15

COURSE NAME: Python Programming with Raspberry Pi

COURSE INSTRUCTORS: Dr. Vikas Baghel

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

- Q1.**
- a) Explain the key hardware changes between Raspberry Pi 4 and Raspberry Pi 5 that affect peripheral compatibility. [1] [CO1]
 - b) For a given revision code 'c04140', identify the model, processor, memory size, and manufacturing details of the Raspberry Pi. [1]
 - c) Outline the steps involved in manually updating a bootloader using a USB or SD card. [1]
 - d) Label the following in Raspberry Pi GPIO pinout diagram: [1]
 - PWM
 - I2C
 - SPI
 - UART
 - e) Compare and differentiate UART, SPI and I2C communication protocols. [1]
- Q2.**
- a) Write a command to measure CPU temperature of Raspberry Pi. [1] [CO1]
 - b) Write a Python script for a Raspberry Pi that turns an LED on when a button is pressed and turns it off when the button is released. [1]
 - c) Write a pseudocode to implement the Raspberry Pi based garden light system where the light turns on if it is dark and there is motion detected. If both conditions are not met, the light should remain off. [2]
- Q3.**
- a) Write an expression that changes the first item in a tuple. For example (4, 5, 6) should become (1, 5, 6) in the process. [1] [CO2]
 - b) What is the correct way to remove an element from a dictionary in Python? Provide an example of a Python code snippet demonstrating the removal of a dictionary entry. [1]

- c) Use either a for loop or a while loop or a nested loop to print out only the non-zero elements of this two-dimensional list: [2]

a = [[0,0,0,0,1], [0,1.7,0,2,0], [0,0,3,0,0], [0,4,0,0,-2.9], [5,0,0,-1,0]]

- d) Write a code that simulates providing the password: [2]

- You have at most three attempts.
- If you provide the right password, the code will print **'Welcome in!'**.
- If you provide the wrong password and it is not the third attempt, the code will print **'Wrong password. Please try again.'** and ask you to enter again the password.
- If your third attempt is not successful, the code will write **'You are not allowed to access this computer!'** and exit.

Assume that the right password is **'JuiT'** and use the function `input()` for asking the password from the command line.