Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering - SEMESTER - V EXAMINATION - WINTER 2025

Subject Code: 3154702 **Date: 21-11-2025**

Subject Name: Python Programming Fundamentals

Time: 10:30 AM TO 01:00 PM **Total Marks: 70**

Instructions

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	List some commonly used MicroPython libraries and explain the purpose of any three of them.	**03**
	(b)	Using the DHT11 sensor, write a MicroPython program to read temperature and humidity every 5 seconds and print the values to the serial monitor. Add logic to turn ON the LED if the temperature exceeds 30°C and turn it OFF otherwise.	**04**
	(c)	Explain what MicroPython is and discuss its key features that make it suitable for microcontroller-based projects. Give comparison of MicroPython and standard Python in terms of features, memory usage, performance, and supported libraries.	**07**
Q.2	**(a)**	Define what a variable is in Python and explain the rules for naming variables.	**03**
	(b)	Write a python code to create a list of integers and perform operations like append(), insert(), remove(), sort(), and reverse().	**04**
	(c)	Write a python program to create two integer variables and demonstrate various arithmetic operation like addition, subtraction, multiplication, division, floor division, modulus, and exponentiation. Write the output of the program.	**07**
		OR	
	(c)	Write a python program to demonstrate the various comparison operator and logical operator. show the output of the program.	**07**
Q.3	**(a)**	Write a program using a for loop to display the multiplication table of a number entered by the user.	**03**
	(b)	Explain the function of Break, Pass and Continue statement in python using suitable example.	**04**
	(c)	Write a Python program that uses external modules datetime, math, random to Display the current date and time, Generate a random number between 1 and 100, Calculate the square root and factorial of a number. Organize the code using custom functions for each task.	**07**
		OR	
	(a)	Write a program using a while loop to print the sum of natural numbers up to n.	**03**
	(b)	Differentiate between for loop and while loop. When is it preferred over a for loop?	**04**

	(c)	Why is data visualization important in Python programming? What is Matplotlib and how is it used for plotting data? Explain withe the help of suitable example.	**07**
Q.4	**(a)**	What is Inheritance? Write a Python program to demonstrate single inheritance by creating a Person class and a derived Student class that inherits from Person.	**03**
	(b)	Discuss the steps to create a custom module in Python. How can it be imported and used in another program? Provide syntax and an example.	**04**
	(c)	Explain **Encapsulation** and **Data Hiding** in Python. Why are they important in OOP? Illustrate with a program where some class attributes are made private, and access to them is controlled using methods.	**07**

OR

	(a)	What is global variable and local variable? Explain their difference with the help of suitable python code.	**03**
	(b)	Explain the steps for opening, reading, writing, and closing a file in Python. Write a short program that appends new content to an existing text file.	**04**
	(c)	Write a Python program to read data from a CSV file, calculate some statistics (e.g., average marks of students), and write the results into another CSV file. Include proper exception handling.	**07**
Q.5	**(a)**	Differentiate between list and tuple in Python.	**03**
	(b)	Write a Python program to demonstrate list slicing. Given a list of numbers, print: First 3 elements, Last 3 elements, Every alternate element.	**04**
	(c)	Explain various string methods in Python with suitable examples for following methods. find(), replace(), split(), join(), strip(), startswith(), endswith().	**07**

OR

	(a)	Write a short note on: Dictionaries and their basic operations	**03**
	(b)	What are nested lists? How can they be created, accessed, and modified? Explain with a suitable example.	**04**
	(c)	Explain the role of regular expressions in advanced string manipulation. Mention common regex functions and provide examples.	**07**

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