

Please check that this question paper contains 09 questions and 02 printed pages within first ten minutes.

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Uni. Roll No.

Program: B.Tech. (Batch 2018 onward)

Semester: 4

Name of Subject: Python Programming

Subject Code: PCIT-105

Paper ID: 16234.

MORNING

16 JUN 2023

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part C has Two Questions Q8 and Q9. Both are compulsory but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

- a) What are the advantages of using Python as a programming language?
- b) What is the purpose of setting up path and environment variables for Python?
- c) Explain the difference between a string and a numeric data type in Python.
- d) How can syntax errors be detected and corrected in Python?
- e) What is the purpose of a command button in a graphical user interface (GUI)?
- f) What is the difference between a class and an object in Python?

Part – B

[Marks: 04 each]

- Q2.** Elaborate on the difference between a list and a dictionary in Python. Discuss their respective characteristics, use cases, and how they are accessed and manipulated in Python.
- Q3.** Write a Python code to calculate income tax based on the user's input.
- Q4.** What are the different types of loops and selection statements available in Python?
- Q5.** Write a Python program to approximate the square root of a given number using a while loop.

- Q6. Explain the concept of recursive functions in Python and provide an example that demonstrates their usage. Discuss the key elements required for designing recursive functions and highlight the importance of defining base cases.
- Q7. How to analyze a given text file and perform a text analysis using Python.

Part – C**[Marks: 12 each]**

- Q8. Discuss the importance and applications of loops and selection statements in programming. Explain the differences between definite iteration and conditional iteration using suitable examples. Furthermore, explain how loops and selection statements can be used in conjunction with strings and text file manipulation, highlighting their significance in real-world scenarios. Provide code snippets to support your explanations.

OR

Imagine you are designing a task management application in Python. Discuss the design considerations and implementation strategies for efficiently storing and managing tasks using lists, dictionaries, functions, and classes. Explain how you would design and implement a function that adds new tasks to the task list, a function that sorts and displays tasks based on priority, and a class that represents a task with various attributes and methods. Provide code snippets and examples to support your explanations.

- Q9. Design a graphical user interface (GUI) program in Python that allows users to input a series of numbers and calculate their average. The program should include windows, input fields, and buttons for user interaction. Discuss the steps involved in designing and implementing this GUI program, including the use of instance variables, event handling, and data validation. Provide a detailed explanation of the code and highlight the key features and functionalities of the program.

OR

Design a program in Python to accomplish the following tasks:

- i. Read a text file containing a paragraph of text.
- ii. Implement a loop to iterate over each word in the paragraph to count the occurrences of each unique word and store the word count in a dictionary.
- iii. Use selection statements to filter out common words and exclude them from the word count.
- iv. Write the updated word count dictionary to a new text file, with each word and its count on a separate line.
