PRESIDENCY UNIVERSITY
BENGALURU

Department of Research & Development

Mid - Term Examinations - SEPTEMBER 2024

Odd Semester: Ph.D. Course Work   **Date**: 28/09/2024

Course Code: CSE5004   **Time**: 2:00pm-3:30pm

Course Name: Essentials of Python Programming   **Max Marks**: 50

Department: CSE   **Weightage**: 25%

Instructions:
(i) Read the all questions carefully and answer accordingly.
(ii) Do not write any matter on the question paper other than roll number.

Part A

Answer **ALL** the Questions. **Each** question carries 5 marks.   (4Q x 5M = 20M)

1. In Ph.D. research, you are working with large datasets representing genetic sequences. Illustrate with examples how you would choose appropriate data types and utilize control structures in Python to optimize the efficiency of your code.   (CO:1)
2. What criteria would you use to evaluate whether to continue using the user-defined function or switch to the built-in function? Discuss potential impacts on performance and maintainability.   (CO:1)
3. What techniques would you use in NumPy to reshape and flatten these arrays? (CO:2)
4. What strategies would you employ for merging or concatenating these arrays?   (CO:2)

Part B

Answer **ALL** Questions. **Each** question carries **15** marks.   (2Q x 15=30M)

5. How do data types, control structures, and functions collectively contribute to software modularity and maintainability? Provide a case study or example from your research.   (CO:1)
6. a. What steps would you take in pandas to clean and preprocess this data? Discuss techniques for renaming, indexing, and deduplication.
   b. Given the following three values, the task is to find the total number of maximum chocolates you can eat.
   money: Money you have to buy chocolates
   price: Price of a chocolate
   wrap: Number of wrappers to be returned for getting one extra chocolate   (CO:2)