NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY

Centre of Multidisciplinary Postgraduate Programs (CMPP)

Postgraduate Diploma (PGD) Programs

Python for Data Science & AI Exam Batch-7

Instructions:
Answer all the questions.
Write your answers clearly and concisely.
You may use any standard Python library.

Question 1: Lists (6 Marks) 1. Given the list numbers = [10, 20, 30, 40, 50], write a Python code snippet to: ▪ Append the number 60 to the list.

- ▪ Remove the number 20 from the list.
- ▪ Insert 80 at index 2.
- ▪ Print the sum of all the elements in the list.

Question 2: Tuples (6 Marks) 2. Consider the tuple coordinates = (12.5, 45.8, 33.1).

- ▪ Write a Python code snippet to unpack the values of the tuple into three variables: `x`, `y`, and `z`.
- ▪ Explain why tuples are generally preferred over lists for storing fixed sets of data.

Question 3: Dictionaries (6 Marks) 3. Given the dictionary `student_scores = {Faraz: 85, Raza: 90, Ishaq: 78}`: ▪ Write a Python code snippet to add a new student `David` with a score of 92. ▪ Update Raza's score to 82.

- ▪ Write a code snippet to print all student names and their scores in the format: `Name: Score`.

Question 4: User-defined Functions (6 Marks)

4. Write a Python function called `calculate_mean` that takes a list of numbers as input and returns the mean (average) of the numbers.

Question 5: Lists and Dictionaries (8 Marks)

5. Write a Python function called `grade_students` that takes a dictionary of student names and their scores, and returns a new dictionary with student names and their corresponding grades (A, B, C, D, F). Use the following grading scale:

- A: 90-100
- B: 80-89
- C: 70-79

- D: 60-69

- F: Below 60

Question 6: Basic Pandas Functions (4 Marks)

6. Given a CSV file named `data.csv` with columns `Name`, `Age`, and `Salary`, write a Python code snippet using pandas to:

- Load the CSV file into a DataFrame.
- Display the first and last 5 rows of the DataFrame.
- Print the mean salary and see if any missing values present visualize the missing values if there.

Question 7: Pandas EDA - Summary Statistics (6 Marks) 7. Using the DataFrame from

Question 6, write a Python code snippet to:

- Calculate and print summary statistics for the `Age` column (mean, median, standard deviation).

Question 8: Pandas EDA - Filtering Data (6 Marks) 8. Using the same DataFrame, write

a Python code snippet to:

- Filter and print the records of employees who are older than 30 years.

Question 9: Pandas EDA - Grouping Data (6 Marks) 9. Using the same DataFrame, write

a Python code snippet to:

- Group the data by `Age` and calculate the mean salary for each age group. ▪ Print the result.

Question 10: User-defined Function and Pandas Integration (6 Marks) 10. Write a

Python function called `load_and_describe_csv` that:

- Takes the filename of a CSV file as input.
- Loads the CSV file into a pandas DataFrame.
- Returns the DataFrame and its summary statistics.

End of Exam

Good luck!