NED UNIVERSITY OF ENGINEERING & TECHNOLOGY

Centre for Multidisciplinary Postgraduate Programmes (CMPP) – NED Academy

Postgraduate Diploma in _Data Science with Artificial Intelligence - Batch 10___

Final Examination – Spring-I-2025

Course: _______Python_____________

Time: 3 Hours Max. Marks: 60

Instructions:

i. Attempt all questions
ii. Marks for each question are given.
iii. You are required to abide by all rules and regulations set for the examination by the NED Academy.
iv. Total time of examination is 3 hours. No extra time will be provided after the time is over.

S. No.	Question	Mark s
1.	**OOP – Class Methods** *Create a Python class named Book that has attributes for title, author, and publication_year. Implement the following methods:* • *__init__: Initialize the attributes.* • *__repr__: Return a clear, formatted string representation of the object.* • *__call__: When an instance is called with a new publication year, update the publication_year attribute.* *Provide example usage and explain the role of each method.*	12
2.	**File Handling – Reading and Seeking** *Write a Python script that does the following:* • *Opens a text file using the with open statement.* • *Reads the first 100 characters of the file.* • *Uses the seek() method to return to the beginning of the file.* • *Reads and prints the entire file content.* *Explain the importance of using with open and how the seek() method affects file reading.*	12
3.	**Functions – Recursion, Decorators, and Lambda** *a. Implement a recursive function to calculate the nth Fibonacci number.*	12

	b. Create a decorator that logs the function's input and output each time the Fibonacci function is called. *c. Write a lambda function that takes a list of numbers and sorts them in ascending order.* *Provide explanations on how recursion works, the benefit of using decorators for logging, and why lambda functions can be useful in such contexts.*	
4.	**Data Types – Lists, Dictionaries, Tuples, and Sets** *Design a Python program that stores student records, where each record consists of a student's name and grade, using different data structures:* • *A list for an ordered collection of student names.* • *A dictionary mapping student names to their grades.* • *A tuple representing an immutable student record.* • *A set for a collection of unique student names.* *Demonstrate key operations (such as adding, updating, retrieving, and deleting elements) for each data structure, and discuss the strengths and weaknesses of each type.*	12
5.	**f-Strings – Advanced Formatting** *Given a list of products where each product includes a name, price, and release date, write a Python program that uses advanced f-string formatting to print a neatly aligned table of product information.* • *Format the price as currency (e.g., with two decimal places and a dollar sign).* • *Display the release date in a human-readable format (e.g., "Jan 01, 2025").* *Explain how f-strings improve code readability and formatting precision.*	12