Python Programming Using Data Analysis Sem-3

Unit 1: Python Basics

1. What are the key features of Python?
2. Explain variables, data types, and type conversion in Python.
3. Explain different types of operators in Python with examples.
4. Write a Python program to find factorial of a number using recursion.
5. Explain control structures in Python (`if`, `if-else`, `elif`, `for`, `while`).

Unit 2: Functions, Modules, and File Handling

1. What is the difference between built-in and user-defined functions in Python?
2. Write a Python program to find the Fibonacci series using a function.
3. Explain the use of `*args` and `**kwargs` in Python functions.
4. How do you create and import modules in Python?
5. Explain file handling operations (open, read, write, close) with examples.

Unit 3: NumPy

1. What is NumPy? What are its advantages over Python lists?
2. Explain how to create NumPy arrays. Write examples using `arange`, `linspace`, and `reshape`.
3. Discuss broadcasting in NumPy with an example.
4. Explain indexing and slicing of NumPy arrays.
5. Write a program to perform matrix multiplication using NumPy.

Unit 4: Pandas

1. What is Pandas? Differentiate between Series and DataFrame.
2. How do you create a DataFrame in Pandas?
3. Explain various DataFrame operations: indexing, filtering, and slicing.
4. What are the different ways to handle missing data in Pandas?
5. Write a program to read a CSV file and display its basic statistics (mean, median, mode, etc.).

Unit 5: Data Analysis with Python

1. Explain the data analysis process using Python.

2. What is data cleaning? Explain techniques used in data cleaning.

3. Discuss how to merge, join, and concatenate DataFrames in Pandas.

4. Explain groupby operation in Pandas with examples.

5. Write a Python script to analyze a dataset and generate summary statistics.

- Frequently Asked 10 Marks Questions

* Compare Python lists, tuples, and dictionaries with examples.

* Write a complete program that reads a CSV file, cleans missing values, and plots a histogram.

* Explain the working of NumPy and Pandas libraries in data analysis.

* Discuss file handling and exception handling in Python.* Write a program to read a DataFrame and display descriptive statistics using Pandas.