

23730

M. Tech.

(Artificial Intelligence and Data Science) Ist Semester

Examination, November-2023

PYTHON PROGRAMMING

Paper-21MTAI21C5

Time allowed : 3 hours]

[Maximum marks : 100

Note : Question one is compulsory. In addition to the compulsory question, students will have to attempt four more questions, selecting one question from each Section.

1. Compulsory Question:

- (i) Explain the difference between a variable and a constant in Python.
- (ii) List three common data types in Python and provide examples for each.
- (iii) What is a Python module?
- (iv) How do you handle exceptions in Python?
- (v) What is the primary use of the NumPy module in Python?
- (vi) What does "slicing and dicing" refer to in the context of Pandas?
- (vii) How can Pandas be used to clean messy data?
- (viii) What is the purpose of the ODBC module in Python for databases?

Section-A

2. Difference between mutable and non mutable data-types? Explain by taking suitable example. Explain the core features of Python that make it a popular programming language for various applications.

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3. Describe the concept of variable and data types in Python. How does dynamic typing work, and why is it important in Python?

Section-B

4. Explain the purpose and usage of the "pickle" module in Python. Provide examples of serializing and deserializing data.
5. What is NumPy? Explain the advantages of using NumPy Module. Write the method of creating Arrays and Matrices with different operation on them.

Section-C

6. What is pandas? Write different advantages of it. Explain string manipulation using pandas by taking a suitable example.
7. Provide detailed examples of data selection, filtering, and manipulation using Pandas. Include use cases for different methods and techniques.

Section-D

8. Explain the process of reading and writing data to files in Python, including text and binary files. Provide practical examples.
9. Explore the concepts of matrix operations, including matrix inversion, dot products, and vectorized functions, using the NumPy module in Python.