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2606E788

Candidate's Seat No: _____

M.Sc. (A.I.& M.L.) Sem.-2 Examination

Advanced Python

Time : 3.00 Hours]

June-2025

[Max.Marks : 100

Instructions:

- **Write both the Sections in the separate answer book.**
- **Both Sections having equal weightage.**
- **Draw Diagrams wherever necessary.**
- **Make Assumptions wherever necessary.**

SECTION – I

- Q-1 Explain the following with an appropriate example: 18**
1. Explain the difference between `is` and `==` in Python with examples.
 2. What are generators in Python? How do they differ from iterators?
 3. Discuss the concept of decorators with a practical example.
- Q-2 Attempt the following: (Any Two) 16**
1. Explain the role of Python's Garbage Collector. How can you manage memory in Python applications?
 2. Describe the use of `pickle` and `marshal` for data serialization. Compare their use cases.
 3. What are Python sockets? Write a basic client-server communication script using `socket` module.
- Q-3 Attempt the following: (Any Two) 16**
1. Describe the role and use of `NumPy` module in scientific computing.
 2. Explain how `Pandas` can be used for data manipulation with an example of `groupby()` and `merge()`.
 3. What is `IPython`? How does it enhance the development experience in scientific computing?

(P.T.O)

SECTION – II

- Q-4 Explain the following with an appropriate example. 18**
1. What is significance of data visualization.
 2. Explain supervised vs unsupervised learning with Python examples using scikit-learn.
 3. What is semi-supervised learning? Give an example use case and how it may be approached in Python.
- Q-5 Attempt the following: (Any Two) 16**
1. Explain the structure of a TensorFlow computational graph with an example.
 2. Write a short note on modules of machine learning.
 3. Describe the role of dropout and batch processing in training a deep learning model in TensorFlow.
- Q-6 Attempt the following: (Any Two) 16**
1. Explain how to handle missing and duplicate data using Pandas. Provide code snippets.
 2. Discuss the use of Matplotlib and Seaborn for visualizing relationships in data. Provide visual examples.
 3. Explain the concept of data munging and give a sample process in Python for cleaning unstructured Excel or CSV data.

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