Graphic Era HILL UNIVERSITY
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University under section 2(f) of UGC Act, 1956

# Term Evaluation (ODD) Semester Examination September 2025

Roll no.....

Name of the Course and semester: MCA AI DS/I
*Name of the Paper:* Python Programming

Paper Code: TMD 102
Time: 1.5 hour Maximum Marks: 50

**Note:**
*(i)* Answer all the questions by choosing any one of the sub questions
*(ii)* Each question carries 10 marks.

Q1. (10 Marks)

a. Compare and contrast lists, tuples, sets, and dictionaries in terms of Mutability and Indexing. (CO1)

OR

b. Demonstrate the difference between shallow copy and deep copy with program examples. Write a program case where shallow copy leads to unexpected results. (CO1)

Q2. (10 Marks)

a. A University wants to maintain student data. Use a list of dictionaries to store student records (id, name, marks). Write a Python program to: (CO1)

- Print toppers
- Calculate average marks
- Identify students below passing marks.

OR

b. Write a Python program to find the frequency of each word in a paragraph (case-insensitive) and display results in descending order of frequency. (CO)1

Q3. (10 Marks)

a. Differentiate between class attributes and instance attributes with examples. Write a program to demonstrate both. ( CO2)

OR

b. Discuss method resolution order (MRO) in Python. Write a case-based example using multiple inheritance and show how Python resolves conflicts. (CO2)

Q4. (10 Marks)

a. Write a Python program to simulate a shopping cart stored as a dictionary. Implement functions to:

- Add an item (name, price, quantity)
- Remove an item
- Calculate total bill with discount (if bill > 1000 apply 10% discount). (CO1)

OR

b. Explain Python's slicing features. Write a Python program that performs **different slicing operations** on a given string based on the user's choice. The program should: (CO1)

i. Accept a string as input from the user.
ii. Display a menu with multiple slicing options:
   - **Case 1:** Display the first half of the string.
   - **Case 2:** Display the second half of the string.
   - **Case 3:** Display every alternate character from the string.
   - **Case 4:** Display the string in reverse order.

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- **Case 5:** Display the middle three characters of the string.

iii. Take the user's choice and apply the corresponding slicing operation.
iv. Print the final result.

Q5. (10 Marks)

a. Differentiate between @staticmethod, @classmethod, and instance methods in Python. Write a program example where all three are used in the same class. (CO2)

OR

b. Explain the concept of metaclasses in Python. Write a simple metaclass that automatically converts all attribute names in a class to uppercase. (CO2)