Roll No:
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St. Claret College

Autonomous, Bengaluru

ST. CLARET COLLEGE LIBRARY Bengaluru-13 AUTONOMOUS

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UG END SEMESTER EXAMINATION-NOV 2025
B.Sc. 1 SEMESTER
DS 125: PYTHON FOR DATA SCIENCE

TIME: 3 hours. **MAX. MARKS: 80**

This paper contains THREE printed pages and FOUR parts

Instructions:
1. **Verify and ensure that the question paper is completely printed.**
2. **Any discrepancies or questions about the exam paper must be reported to the COE within 1 hour after the examination.**
3. **Students must check the course title and course code before answering the questions.**

PART-A

Answer ALL questions. Each answer carries ONE mark. **[1 x 10 = 10]**

1. Which of the following is a valid variable in Python?
   a. 1semester b. 1-semester c. semester_1 d. first'semester
2. In Python, which operator is used for exponentiation?
   a. ^ b. ** c. * d. //
3. Keys in a Python dictionary are immutable.
   a. True b. False c. Can't say d. None of the above
4. Which list method is used to remove and return an element?
   a. delete() b. pop() c. remove() d. discard()
5. Which of these keywords is used to skip the current iteration of a loop?
   a. pass b. break c. stop d. continue
6. Which special method in Python is called a constructor?
   a. self() b. __init__() c. initialize() d. begin()
7. Which block always executes in exception handling?
   a. try b. except c. else d. finally
8. Which NumPy function creates an array with evenly spaced numbers?
   a. linspace() b. range() c. random() d. arrange()
9. A Pandas series is:
   a. 1D labelled array b. 2D table c. Key-value store d. Matrix only
10. Which Pandas method is used to remove missing values?
    a. dropna() b. fillna() c. replace() d. clean()

PART-B

Answer any TEN questions. Each answer carries TWO marks. **[2 x 10= 20]**

11. List any four features of Python.
12. Write a Python program to check whether a number is even or odd using operators.
13. Demonstrate the use of logical operators with an example.
14. Given nums = [5, 2, 9, 1, 7], write a lambda function to compute the squares of all elements and call it to print the squares.
15. Differentiate between Sets and Dictionaries.
16. Given prices = {"pen": 10, "book": 50, "bag": 200}, write the python code to update the price of "book" to 55 and print the key-value pairs.
17. Write a Python program using **if–elif–else** to determine whether a number is positive, negative, or zero.
18. Define a class Student with attributes name and marks, and a method to display them.
19. Write a Python code snippet to handle an invalid input using a try–except block.
20. Create a NumPy array of **integers** 1 to 9 and reshape it into a 3 × 3 matrix.
21. Write Pandas code to read a CSV file named data.csv and display the first five rows.
22. List any 4 key features of the Pandas package.

PART-C

Answer any FOUR questions. Each answer carries FIVE marks. **[4 x 5 = 20]**

23. Explain the applications of Python in detail.
24. Given the list nums = [5, 2, 9, 1, 7], write a Python program to:
    a. Display the first three elements
    b. Sort the list in descending order
    c. Append 10 to the list
    d. Remove the element 2
    e. Print the updated list
25. Explain the working of the for loop with a flowchart and example. Write a program to display the first 10 even numbers.
26. Explain map() and filter() functions with appropriate examples.
27. Write Python code to perform the following operations on the NumPy array given below:

$$arr = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

    a. Find the shape, size and dimensions of the array.
    b. Compute the sum of all elements.
    c. Find the row-wise sum.
    d. Calculate the standard deviation of all elements.
    e. Compute the transpose of the array
28. Explain how to merge two data frames using the Pandas package with an example.

PART-D

Answer any THREE questions. Each answer carries TEN marks. **[3 x 10 = 30]**

29. Explain arithmetic (any two), relational(any two), identity, and membership operators with code snippets.
30. Explain the characteristics of Python tuples. You are given a dictionary of 5 products and their prices:
    {'Pen': 10, 'Pencil': 5, 'Book': 50, 'Bag': 200, 'Bottle': 80}
    Write a Python program to perform the following operations:
    a. Display all products
    b. Display all prices
    c. Find the highest price in the dictionary
    d. Add a key-value pair.
    e. Illustrate the use of get() method.
31. What is NumPy? Discuss **any** five NumPy built-in functions (such as arrange(), ones(), sum(), mean(), max(), reshape() etc).
32. What is object-oriented programming? Explain with an example inheritance and method overriding in Python.
33. Consider the data given and write the Python code to perform the actions mentioned below:

Month	Product	UnitsSold	UnitPrice
Jan	Pen	100	10
Jan	Book	60	50
Feb	Pen	80	10
Feb	Book	75	50
Mar	Pen	120	10
Mar	Book	90	50

- Create a dataframe named **sales** for the above data and display it.
- Display the first two and last two records.
- Add a new column **TotalSales** to the dataframe such that TotalSales = UnitPrice * UnitsSold.
- Display only the sales records for **Feb**.
- Display the month-wise average UnitsSold.