



VIT
Vellore Institute of Technology

Final Assessment Test – November 2025

Course: UCSC101L - Programming in Python

Class NBR(s): 5910/5912

Time: Three Hours

Slot: D1+TD1

Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

COs	CO Statements
CO1	Understand and comprehend the basic programming constructs of Python programming.
CO2	Implement a given algorithm using Python's building blocks and control structures.
CO3	Demonstrate the implications of specialized data structures in Python.
CO4	Solve real time problems using strings and regular expressions.
CO5	Develop applications using functions and file handling mechanism in python.

BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Answer ALL Questions

(10 X 10 = 100 Marks)

- Explain the built-in data types available in python with appropriate syntax [5] CO1 BL2 and example. How does python determine the data type of a variable during assignment?
 - List the naming convention rules for creating identifiers in python [5] programming with example.
- Develop a python program to check the eligibility for a driving licence according to the following transport department rules: CO2 BL2
 - If the applicant is 18 years or older, they must have passed the learners test to be eligible.
 - If the applicant is below 18 years, they are not eligible regardless of the learner's test status.

Use nested if statement to determine the eligibility. Display one of the following messages based on the rules given above,

- "Eligible candidate – Passes the test"
- "Not Eligible – Learners Test is pending"
- "Not Eligible – Age is below 18."

3. Design a python program to print the below Floyd's triangle with n rows. Use nested loops and ensure that the number increase consecutively across rows.

1

2 3

4 5 6

7 8 9 10

4. A supermarket manager maintains a record of the top-selling grocery items for a given week, stored in a python list as follows:

```
Grocery_items = ["rice", "pasta", "bread", "apples", "cheese", "eggs"]
```

Additionally, the manager wants to perform the operations on this list of items using python program to count how many items in the list contains the letter 'a', check whether 'bread' is present in the list, sort the list in alphabetical order, and with list comprehension create and display new list where all the items' names are capitalized.

5. Consider a weather monitoring station stores daily temperature readings in a tuple:

34,26,38,29,46,57,20.

As a data analyst write a python program to perform the following operations with appropriate tuple methods and conversions.

- Calculate and display the average temperature.
- Display the temperatures in reverse order.
- Find and print the index of temperature 29 in the tuple created.
- Insert a new temperature reading 36 at the second position and print the updated sequence.

6. Create a python-based inventory management system for a stationery store.

The current inventory stored in a dictionary is mentioned below,

```
Inventory = {"notebooks": 120, "pens": 200, "erasers": 150, "markers": 80}
```

As part of a daily update routine, the following operations are performed,

- Increase the quantity of "pens" by 50 units more.
- Include "highlighters" to the inventory with a quantity of 30.
- Print the total quantity of all products currently in inventory.
- List all products whose quantity is less than 100.

7. Imagine you are a project manager overseeing two teams working on different aspects of a software project. Each team has members with specific technical skills as given below,

CO3 BL4

Team_A = {"Python", "SQL", "Excel"}

Team_B = {"Excel", "PowerPoint", "Python"}

Analyse the above skill sets to make staffing decisions and identify training needs and perform the following tasks using python sets.

- Find all skills present in both teams
- Find skills shared by both teams
- Find skills unique to Team_B
- Find skills that are unique to either Team_A or Team_B, but not both.

- 8.(a) Consider a software engineer is working on a text-processing application that filters user input before saving it to the database. The application distinguishes between two groups of alphabets as vowels and consonants. For certain processing tasks, every occurrence of a vowel in a user's input string must be removed, so that only the consonants and any non-alphabetic characters remain. Suppose the engineer receives the following strings from the user

CO4 BL5

Sentence_1 = "Welcome to"

Sentence_2 = "Python Programming!"

Write a python program that concatenates both the strings and store in Sentence_3, processes the string Sentence_3 to remove all the vowels (both upper case and lower case), leaving only consonants and other characters. Display the modified string as the final output.

OR

- 8.b) A website requires user to register with a secure transaction password. The system uses regular expressions to validate each password based on the following rules:

CO4 BL5

- Must contain at least one lowercase letter [a-z]
- Must contain at least one uppercase letter [A-Z]
- Must contain at least one digit [0-9]
- Must contain at least one special character [\$#@]
- Length of the string must be between 6 and 12 characters.

Write a python program for the following based on above rules

- a) Accept a sequence of comma-separated passwords from the user. [3]
- b) Validates each password using regular expressions. [3]
- c) Print all valid passwords, separated by commas. [2]
- d) If none are valid, print "invalid". [2]

9. You are designing a simple math support tool for primary school students. The tool should help learners understand the concept of squaring numbers. Write a Python program that defines a user-defined function named SquareList () which accepts a five list of integers and returns a new list with each element squared. Prompts the user to enter 5 whole numbers and stores them in a list and call the SquareList () function with the user-defined list and display both the original and squared list separately. CO5 BL5

10.a) Demonstrate file operations with a python program that creates a text file named records.txt, write a structured data into the file and read the data from the file using appropriate file methods. CO5 BL4

OR

10.b) Critically evaluate the computational advantages of NumPy arrays over native Python lists with example. Create a 3-D array with 2-D arrays, both containing two arrays with the values 1, 2, 3 and 4, 5, 6 and check for dimensions, shape and size of the array. CO5 BL4

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