

Name: Enrolment No:			
UPES End Semester Examination, December 2025 Course: Python Programming Program: BSc CS Course Code: CSEG1021 Semester: 3rd Sem Time : 03 hrs. Max. Marks: 100 Instructions:			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	Explain mutable and immutable data types in Python with two examples each. Also describe how Python internally handles immutability.	4	CO1
Q 2	Write a Python program that takes an integer as input and prints: a) whether it lies between 100 and 500 b) whether it is divisible by both 2 and 7 Use nested if-else conditions.	2x2=4	CO2
Q 3	Write a function stats(x, y) that returns: • maximum • minimum • average Demonstrate calling the function using positional, keyword, and default arguments.	4	CO2
Q 4	Write a Python program using a while loop to display all numbers from 1 to 40 inside the loop: a) skip numbers that are multiples of 6 using continue b) stop the loop when the number reaches 33 using break	2x2=4	CO2
Q5	Write a program that takes a string and prints: • number of uppercase letters • number of lowercase letters • number of special characters	4	CO2
SECTION B (4Qx10M= 40 Marks)			
Q 6	a) Demonstrate with code how to merge two lists in three different ways. b) Write Python code to create a dictionary of 5 items and show how to: • find all keys starting with a particular letter • extract all values greater than a given number	5x2=10	CO3

Q 7	a) Write Python code to demonstrate insertion, deletion, updating, and searching in a: - list - dictionary b) Explain the differences between set and tuple, with examples.	5x2=10	C03
Q 8	a) Explain the working of the following string functions with examples: rfind(), title(), isdigit(), swapcase(), partition() b) Write a Python program that counts how many words in a sentence start with a vowel.	5x2=10	CO3
Q9	a) Given a list of integers, write code to: - remove duplicates - sort the list in descending order - compute the second-largest number - display the final list b) Convert the final list into a set and describe two operations unique to sets. OR a) Create a dictionary that stores the names of three students as keys and their marks as values. Perform the following operations: - add a new key–value pair - update an existing student’s marks - delete one entry - display all keys and values b) Create a set of unique marks from the dictionary and demonstrate: - adding a new element - removing an element - checking membership using in	5x2=10	CO 3
SECTION-C (2Qx20M=40 Marks)			
Q 10	Using NumPy, write a program that: - Creates a 4×4 matrix of random integers between 1 and 50 - Computes row-wise sums and column-wise sums - Finds the square root of each element - Stacks two arrays vertically and horizontally	5x4	CO4
Q 11	a) Using Matplotlib write a Python program to plot two lines on the same graph (10 marks each): - Line 1: x = [1,2,3,4], y = [2,3,5,7] - Line 2: x = [1,2,3,4], y = [1,4,2,8] Add labels, title, legend, and grid. OR	20	CO 4

	b) Using Pandas Create a DataFrame containing Employee details (Name, Department, Salary). Perform the following (5 marks each): • display only employees with salary > 50000 • compute average salary department-wise • add a new column “Bonus” = 10% of salary • show the updated DataFrame		
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