Reg. No: ..... Name : .....

VISWAJYOTHI COLLEGE OF ENGINEERING AND TECHNOLOGY (Autonomous)

FIRST SEMESTER B.TECH DEGREE EXAMINATION DECEMBER 2025 (2025 SCHEME)

Course Code: 25VJICEST105

Course Name: ALGORITHMIC THINKING WITH PYTHON

Max. Marks: 60 **Duration: 2 Hours 30 Minutes**

PART A

Q.No.	*Answer all questions. Each question carries 3 marks*	*CO*	*Marks*
1	What is the purpose of evaluating the solution?	CO1	3
2	Identify a real-life scenario where the backtracking problem-solving strategy can be applied. Explain why this strategy is suitable.	CO1	3
3	Compare pseudocode and flowcharts. Which one is better in terms of clarity?	CO2	3
4	Why is pseudocode considered language-independent?Differentiate between an algorithm and pseudocode	CO2	3
5	Explain the terms a)scope and b)local scope for a variable in Python.	CO3	3
6	Write a python program to subtract two matrices using Numpy.	CO3	3
7	With the help of an example, state one advantage of brute-force despite inefficiency.	CO4	3
8	What is the motivation for using a randomized approach in problemsolving.	CO4	3

PART B

Answer any one full question from each module. Each question carries 9 marks

Module 1

9	a.	Write a Python program to create two variables, one storing an integer and another storing a string, and display them.	CO1	4
	b.	Discuss the importance of analyzing a problem before choosing a problem-solving strategy	CO1	5
10	a.	What are the benefits of following a structured problem-solving process in Python programming?	CO1	4
	b.	What is a syntax error? How can such errors be identified and corrected?	CO1	5

Module 2

11	a.	Differentiate between the terminal (start/end) symbol and the process (arithmetic calculation) symbol.	CO2	3
	b.	Write pseudocode to implement Student Grading (KTU Scale) using if else ladder and case structure	CO2	6
12		Write the Pseudocode to Print Numbers in Descending Order using for, while and repeat until loop.	CO2	9

Module 3

13	a.	What are the motivations for modularization?	CO3	6
	b.	Write a python program to reverse the contents of a 1Dimensional array using list.	CO3	3
14	a.	Write a Python program that takes two numbers as input from the user and prints the larger of the two numbers. If both numbers are equal print the same.	CO3	3
	b.	What is recursion in programming? Compare recursion with iteration	CO3	6

Module 4

15	a.	State the basic steps in the divide-and-conquer method	CO4	3
	b.	Studies show that the capacity of an empty human stomach is 1.5 litres on average. Give a greedy algorithm to output an efficient lunch menu maximizing the total nutritional value. The available items along with their nutritional values are tabulated below: You may assume that 1 cup is equivalent to 250ml	CO4	6

Recipe	Available quantity	Nutritional value
Cooked rice	2.5 cups	800 calories
Sambar	1.5 cups	140 calories
Potato curry	0.5 cup	50 calories
Fish fry	0.5 cup	200 calories
Buttermilk	1 cup	98 calories
Payasam	2 cups	300 calories

16	a.	A library wants to estimate how frequently books are checked out but cannot track every book individually. Explain how randomness can help in estimating the average checkout rate?	CO4	4
	b.	Explain any one real-world problem where dynamic programming is applied.	CO4	5

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