Reg No.: _____ Name : _____

Jyothi Engineering College(Autonomous)

B. Tech Degree S1 (S) Examination, June 2026 (2025 Scheme)

25EST105 - ALGORITHMIC THINKING WITH PYTHON

Total Mark: 60 **Total Time: 2hrs 30 min**

		CO	MARK

PART A

(Answer All Questions. Each question carries 3 marks)

1.	What are the different problem solving process to design a menu-driven calculator that supports four basic arithmetic operators - addition, subtraction, multiplication, and division?	CO1	(3)
2.	Write python code to combine the two string literals, "I love" and "Python", into a single string "I love Python".	CO1	(3)
3.	Explain the differences between a for loop and a while loop.	CO2	(3)
4.	Write an algorithm or pseudocode to find the area and circumference of a circle.	CO2	(3)
5.	Write a Python program to display the first three and the last three characters of a string entered by the user using slicing.	CO3	(3)
6.	What is modularization? What are the motivations for modularization?	CO3	(3)
7.	Compare Dynamic Programming and Recursion in terms of their approach, efficiency, and use cases.	CO3	(3)
8.	Consider a situation where you have forgotten the password to your online account. Also, note that no password recovery option is available. Which strategy is employed to solve this problem, and how?	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 find floor and ceil value of input from user using math module and convert a degree value entered by user to radian using math module.	CO1	(5)
b)	Write a Python program using the math module to calculate the sine, cosine, and tangent values of an angle (in degrees) entered by the user.	CO1	(4)

OR

10. a)	Evaluate the following Python expressions: (a) 7 + 3 * 2 ** 2 (b) (18 // 4) % 3 + 6 (c) not (5 <= 2 or 8 > 3) (d) 8 + 4 * 2 - 6 / 3 (e) 2 ** 3 ** 2	CO1	(5)

b) Explain the four rules to be followed while naming variables in Python. CO1 (4)

Module - 2

11. a) Write a case statement to print the color based on a code value as follows: CO2 (5)

Grade	Message
R	Red
G	Green
B	Blue
Any other value	Wrong code

b) Write pseudo code to find the average mileage of a car in kilometers per litre after six fill-ups at petrol pumps. Input data include the number of litres of diesel, the starting odometer reading, and the odometer reading at each fillup. CO2 (4)

OR

12. Draw a flowchart to print the first n terms of the Fibonacci sequence. CO2 (9)

Module - 3

13. a) What is a tuple in Python? Explain any four operations that can be performed on tuples with examples. CO3 (5)

b) Explain how the call stack works during recursive function execution with the help of a suitable example. CO3 (4)

OR

14. a. Write a Python program to check whether a given number is a prime number or not. CO3 (9)
b. What is a tuple in Python? Explain any four operations that can be performed on tuples with examples.

Module - 4

15. Illustrate the process of sorting the array [15, 8, 3, 12, 6, 10, 4, 1] using the merge sort algorithm. Draw a diagram showing how the array is split and merged at each stage. CO4 (9)

OR

16. Use brute force to find the element that appears most frequently in an array by counting the occurrences of each element and selecting the one with the highest count. This involves iterating through the array and maintaining a count for each element. CO4 (9)

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