

VR24

Reg.No:

24E006070

**VELAGAPUDIRAMAKRISHNASIDDHARTHAENGINEERINGCOLLEGE**  
(Deemed to be University)

**I B.Tech SUMMATIVE ASSESSMENT, November 2024**

First Semester | AY: 24-25

**COMMON TO ALL BRANCHES****24CS101-PROBLEMSOLVINGWITHPYTHON****Max.Marks:80****Time: 120 Minutes****ANSWER ALL QUESTIONS**

Q.No	Questions(Answer all questions)	Marks	CO	K
1.	a Write an algorithm, draw a flowchart to swap the values of two variables with and without using a third variable. Example: Given A = 5 and B = 10, after the swap, A = 10 and B = 5.	8	1	2
	b Develop an algorithm, draw a flowchart to reverse the digits of an integer. Example: If the input is 12345, the output should be 54321.	8	1	2
2.	a Develop an algorithm, draw a flowchart that recommends travel destinations based on the user's budget and preference (Adventure or Relaxation). If the budget is over ₹1,50,000, recommend the Himalayas (for Adventure) or Paris (for Relaxation). Otherwise, recommend Goa (for Relaxation) or Waynad (for Adventure).	8	2	2
	b Write an algorithm, and a Python program to check if a given year is a leap year. A year is a leap year if: • It is divisible by 4, • If divisible by 100, it must also be divisible by 400.	8	2	2
	a Write an algorithm, and a program that categorizes a number as positive, negative, or zero.	8	3	3
3.	b Design a flowchart and write a Python program to compute the HCF of two integers.	8	3	3
4.	a Develop a program that uses set operations to demonstrate: • Union (combining two sets of data). • Intersection (finding common elements between sets). • Difference (elements unique to one set). Include functionality for dynamically adding and removing items from the sets.	8	4	2
	b Create a program that defines several functions to perform tasks like: • Calculating the area of a rectangle. • Finding the maximum of a list of numbers. • Printing personalized greetings. Demonstrate variable scope by modifying variables inside and outside functions.	8	4	2
5.	a Write a program that demonstrates variable lifetime by defining local and global variables within and outside of functions. Show how global variables retain their values across function calls.	8	5	3



b	Implement a binary search algorithm to find a specific product in a sorted list of prices for a shopping app. Discuss the efficiency of this approach for large datasets.	8	5	3
---	---	---	---	---

**Cognitive Levels(K):**

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Outcomes	Outcomes	BTL Levels
CO1	Infer basic concepts of computers and program design tools.	2
CO2	Explain Python primitives for solving problems.	2
CO3	Apply problem solving strategies and techniques.	3
CO4	Illustrate python function, classes and modules to solve engineering problems.	2
CO5	Use advanced problem solving techniques to solve engineering problems.	3



**VELAGAPUDIRAMAKRISHNASIDDHARTHAENGINEERINGCOLLEGE**  
(DeemedtobeUniversity)

**I B.Tech SUMMATIVE ASSESSMENT, November 2024**

First Semester | AY: 24-25

**COMMON TO ALL BRANCHES**

**24CS101-PROBLEM SOLVING WITH PYTHON**

**Time: 120 Minutes**

**Max. Marks: 80**

**ANSWER ALL QUESTIONS**

Q.No	Questions(Answer all questions)	Marks	CO	K
1.	a. Create an algorithm, draw a flowchart that calculates the sum of a given set of numbers. Example: Given the numbers 12, 15, 7, 10, the program should compute their total sum: 44.	8	1	2
	b. Write an algorithm, draw a flowchart that generates the first 'n' terms of the Fibonacci sequence. Example: Generate the first 10 terms: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34.	8	1	2
2.	a. Develop a program that uses arithmetic operators to perform basic operations (addition, subtraction, multiplication, division) and relational operators to compare two user-inputted numbers and display the results	8	2	2
	b. Write an algorithm and a program that prints numbers from 1 to 10 using a while loop.	8	2	2
3.	a. Write an algorithm, and a program that prints a multiplication table up to 10 using nested loops.	8	3	3
	b. Design a flowchart and write a Python program to calculate the Least Common Multiple (LCM) of two integers.	8	3	3
4.	a. Develop a program to demonstrate how to store and retrieve data using Python data structures: tuples, lists, sets, and dictionaries. Implement examples for: • Adding and removing elements in lists. • Accessing elements in a tuple. • Performing set operations like union, intersection, and difference. • Using a dictionary to store key-value pairs. Compare the advantages and limitations of each data structure.	8	4	2
	b. Write a program using list comprehensions to generate lists based on certain conditions, such as: • Generating a list of squares of even numbers between 1 and 20. • Filtering a list of strings based on whether they start with a specific letter.	8	4	2
5.	a. Develop a program using lambda functions to: Sort a list of tuples based on specific criteria. Filter a list of numbers to retain only those greater than a certain value.	8	5	3
	b. Develop a function for a math app that calculates the factorial of a number. Additionally, implement a recursive function to generate the nth	8	5	3



Fibonacci number.

**Cognitive Levels(K):**

*K 1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create*

Course Outcomes	Outcomes	BTL Levels
CO1	Infer basic concepts of computers and program design tools.	2
CO2	Explain Python primitives for solving problems.	2
CO3	Apply problem solving strategies and techniques.	3
CO4	Illustrate python function, classes and modules to solve engineering problems.	2
CO5	Use advanced problem solving techniques to solve engineering problems.	3