Name:.....
Roll No:.....

MAR ATHANASIUS COLLEGE OF ENGINEERING (AUTONOMOUS),

KOTHAMANGALAM - 686666

DEPARTMENT OF CIVIL ENGINEERING

B.TECH FIRST SERIES EXAMINATION, OCTOBER 2026 (S1 CA)

B24ES1T01B - PROBLEM SOLVING AND PROGRAMMING TECHNIQUES (B)

Duration: 1.5 Hours Max. Marks: 40

PART A

Answer all the questions. Each question carries 3 marks.

1	A civil engineering student needs to develop a systematic procedure to calculate the total cost of materials required for a construction project. Explain the steps involved in algorithmic problem-solving using this situation as an example. Also explain how an algorithm can simplify the problem and improve the efficiency and accuracy of the solution.	**(CO1)**
2	List two popular IDEs for Python programming and one feature of each.	**(CO1)**
3	A student wants to maintain a list of marks obtained in different tests using Python. Define a list in Python and explain any two list methods that can be used to add, modify, or remove elements from the list, with suitable examples.	**(CO2)**
4	Differentiate between a list, tuple, and dictionary in Python with respect to their syntax, mutability, and method of storing data.	**(CO2)**

PART B

Answer all the questions. Each question carries 14 marks.

5 (a)	Explain the purpose of comments in Python and provide an example of a Python program that uses both single-line and multi-line comments to calculate the square of a given number.	**(CO1) (10 marks)**
(b)	A civil engineering student is developing a step-by-step procedure to calculate the quantity of materials required for a construction project. Define an algorithm and state any two characteristics of a good algorithm that would make the procedure effective and reliable.	**(CO1) (4 marks)**
6 (a)	A teacher wants to maintain a list of five marks entered by the user for a particular assessment. Write a Python program to display the entered marks, add a newly obtained mark at the end of the list, insert another mark at a specified position, remove a specified mark from the list, and finally display the updated list along with the total number of elements.	**(CO2) (7 marks)**
(b)	A weather monitoring system stores the temperature readings recorded five different times in a day. Write a Python program to create a tuple using the temperature values entered by the user. Display the tuple, access and display selected readings using indexing, display a range of readings using slicing, and demonstrate the use of the count() and index() methods for a temperature value entered by the user.	**(CO2) (7 marks)**

VISION

To develop a department proficient in all aspects of civil engineering blending theory and practice

MISSION

1. **To impart the right combination of civil engineering fundamentals and use of modern tools to the students**
2. **To encourage learning with due emphasis given to professional ethics and traditional norms.**
3. **To enhance the knowledge base of students in liaison with practice and research**
4. **To encourage life-long learning**

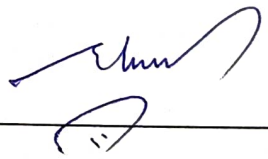
Course outcomes:

The student will be able to

CO1 Understand fundamental computing concepts, including algorithms, pseudocode, flow charts, and algorithmic problem-solving techniques.

CO2 Develop proficiency in using Python's data structures, control flow statements, and loops to effectively manage and manipulate data.

Question No.	1	2	3	4	5a	5b	6a	6b	Total Marks
CO Mapping	CO1	CO1	CO2	CO2	CO1	CO1	CO2	CO2	
Bloom Taxonomy Level	L2	L1	L2	L3	L3	L2	L3	L3	
Max. Mark	3	3	3	3	10	4	7	7	40

	Prepared By	Scrutinized By	Approved By
Name	Dr. Devika Venu	Prof. Helen Thomas	Dr. Elson John (HOD, CE)
Signature			

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