Register No.:   ....   Name: ....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER INTEGRATED MCA DEGREE EXAMINATION (R), DECEMBER 2023
(2020 SCHEME)

Course Code: 20IMCAT105

Course Name: Introduction to Programming

Max. Marks: 60   **Duration: 3 Hours**

PART A
(Answer all questions. Each question carries 3 marks)

1. What is an expression? Evaluate the following expression:
   3 + (4 + 6) X 2 - (8 / 2) X 3.
2. Construct a flowchart to show how consecutive odd numbers starting from 1 are summed up until its sum exceeds 1000. Display the sum and the number of odd numbers added.
3. Define algorithm. Write the properties of a good algorithm.
4. What are the differences between integer, real and string variables?
5. Differentiate sequence structure and decision structure with suitable examples.
6. Write an algorithm to check whether a given year is leap year or not.
7. Differentiate a sentinel-controlled loop and a counter-controlled loop.
8. Write an algorithm to print the following pattern if input number is 4.
   1
   2 3
   4 5 6
   7 8 9 10
9. Define one dimensional array. Explain it with an example.
10. Design an algorithm to find the minimum value in an array of N numbers.

PART B
(Answer one full question from each module, each question carries 6 marks)

MODULE I

11. Distinguish between system flowcharts and program flowcharts. List the various symbols used in flowcharts.   (6)

OR

12. a) Explain the general rules of flowchart.   (2)
    b) Construct a flowchart to check whether the given number is Armstrong or not.   (4)

MODULE II

13. a) Explain the different types of operators used in an algorithm with the help of suitable examples.   (4)

b) Differentiate constant and variable. Explain with the help of an example.   (2)

OR

14. Formulate an algorithm and draw a flowchart to solve a quadratic equation.   (6)

MODULE III

15. Describe the various decision-making structures used in an algorithm with suitable examples.   (6)

OR

16. a) Design an algorithm to find the greatest of three numbers.   (3)
     b) Write an algorithm to check whether an input number is zero, positive or negative.   (3)

MODULE IV

17. Explain repetition control structures with the help of a diagram and suitable examples.   (6)

OR

18. Design an algorithm and flowchart to find the sum of first N Fibonacci series.   (6)

MODULE V

19. a) Design an algorithm to find the sum of two arrays.   (3)
     b) Draw a flowchart to find the average of an array of N numbers.   (3)

OR

20. a) Design an algorithm and draw a flowchart to perform linear search in an array.   (4)
     b) Differentiate variable and array.   (2)

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