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**SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**FIRST SEMESTER INTEGRATED M.C.A DEGREE EXAMINATION (R), FEBRUARY 2022****(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. Give the various flowchart symbols and their use.
2. Define data and information.
3. Differentiate constant and variable. Explain with the help of examples.
4. What is the use of algorithm, flowchart and pseudocode in the perspective of problem solving?
5. Differentiate if-then-else structure with nested else-if structure.
6. Write an algorithm for swapping two numbers without using temporary variable.
7. What is the difference between a sentinel-controlled loop and a counter-controlled loop?
8. Predict the output of the following statements  
for ( i = 1; i <= 3; i=i+1)  
    for ( j = 1; j <= 3; j=j+1)  
        print i \* j  
    endfor  
endfor
9. What is an array? Explain the one-dimensional array with the help of an example.
10. Design an algorithm to find the maximum value in an array of N numbers.

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

11. Differentiate system flowcharts and program flowcharts. What are the advantages and disadvantages of a flowchart? (6)

**OR**

12. a) What are the general rules of flowcharting? (3)  
b) Draw a flowchart for finding sum of the digits of a given number N. (3)

**MODULE II**

13. What is an operator? List and explain various types of operators. (6)

**OR**

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

**MODULE III**

15. a) What is the difference between a sequence structure and a decision structure? (3)  
b) Demonstrate with an algorithm to find the greatest number between three numbers. (3)

**OR**

16. A bookseller offers two rates of commissions. If the price of a book lies below 100, the rate of commission is 12% of the price. otherwise, it is 18 % of the price. It is required to develop a flowchart and algorithm to determine the discount and net price of a book. (6)

**MODULE IV**

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

**OR**

18. Using “while”, write an algorithm and flow chart to print the multiplication table of a given number N,  $2 \leq N \leq 10$ . Write an algorithm to replace the “while” statement with an equivalent “for” statement to get the same output. (6)

**MODULE V**

19. Design an algorithm and draw a flowchart to perform linear search in an array. (6)

**OR**

20. a) How can we represent an array in algorithm? Explain with proper example. (3)  
b) Draw a flowchart to find the average of an array of N numbers. (3)

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