2023

PROGRAMMING FOR PROBLEM SOLVING

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. a) Fill in the blanks *(any five)*   1 x 5 = 5
    i.   Array elements are always stored in _____ memory locations.
    ii. The function _____ is used to determine the length of a string.
    iii. A variable declared inside a function is called a _____.
    iv. Address of the first element of an array is called its _____.
    v.   The _____ is equivalent to $a = a - 1$.
    vi. An immediate exit from the loop can be achieved by a _____ statement.

    b) State whether the following statements are *True* or *False*: *(any five)*   1 x 5 = 5
    i.   C programs are converted into machine language with the help of a program called Editor.
    ii. Algorithm is the graphical representation of logic.
    iii. #define is known as preprocessor compiler directive.
    iv. The function *fseek()* returns the current position in a file.
    v.   A function cannot be defined inside another function.
    vi. A break statement passes control to the next iteration of the loop.

    c) Differentiate between the following: 3+3+4=10
    i.   while and do while
    ii. variable and keyword
    iii. array and structure

2. a) Write a C program to find the sum of the series $1 + 1/2! + 1/3! + 1/4! + \ldots$ 10

    b) Write a C program to display all prime numbers between 20 and 2000.   10

3. a) Write a C program to search for a specific element from an array and print the position of its first occurrence.   10

b) How can we pass an array to a function? Write a C program that uses a function to find the largest element in an array.   10

OR

Write a C program to Find the sum of the first 100 natural numbers.

4. a) Write a C program to check whether an entered character is a vowel or not using a switch-case statement.   10

    b) Write a C program to Compute the sum of two matrices of size *3x3*.   10

5. a) Discuss formal parameters and actual parameters with examples.   4

    b) Write the difference between the following *(any two)*:   3+3=6
   i. library function and user defined function
   ii. break and continue statements
   iii. Prefix and postfix operators

    c) Discuss the unary, binary and ternary operators in C-language with examples.   10

6. a) Write a program to check if a given word is palindrome or not.   10
    b) Write a C Program using structure to store and display the name, roll number, age and branch of 5 students.   10

7. a) What do you mean by recursion? Write a C program to find the sum of the given series using recursion: $1 + 2 + 3 + \ldots + n$ 10

    b) Define function call by reference? Write a suitable program to explain it.   10

OR

What do you mean by a pointer? Write a C program using pointers to compute the sum of all the elements stored in an array.

8. Write short notes on the following: *(any four)*   5 x 4 = 20
   i) Flowchart   iv) Loop in programming language
   ii) Secondary storage device   v) Algorithm
   iii) ALU   vi) Precedence and associativity