



CBCS SCHEME

17PCD13/23

First/Second Semester B.E. Degree Examination, June/July 2023 Programming in C and Data Structures

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is Pseudocode? Explain with example. (04 Marks)
- b. Explain the different input and output functions in C with syntax and examples. (06 Marks)
- c. What is an Operator? List and explain the various types of operators used in C program. (10 Marks)

OR

- 2 a. Explain the general structure of C program with example. (08 Marks)
- b. Convert the following mathematical expression into 'C' equivalent :
 - (i) $\text{area} = \sqrt{s(s-a)(s-b)(s-c)}$
 - (ii) $x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$
 - (iii) $y = \frac{\alpha + \beta}{\sin \theta} + |x|$
 - (iv) $\frac{e^{a+b}}{x+y} (2x+3)$ (04 Marks)
- c. Draw a flowchart and write a C program to find area and perimeter of a circle. (08 Marks)

Module-2

- 3 a. Explain if, if-else and nested if-else with examples and syntax. (06 Marks)
- b. Write a C program to find the reverse of an integer number and check whether it is palindrome or not. (06 Marks)
- c. Explain the different loops in 'C' language with syntax and examples. (08 Marks)

OR

- 4 a. What are unconditional control statements? Explain with examples. (08 Marks)
- b. Explain switch statement with an example. (06 Marks)
- c. Write a C program to check the given number is prime or not. (06 Marks)

Module-3

- 5 a. What is an array? Explain the declaration and initialization of one dimensional and two dimensional array with examples. (08 Marks)
- b. Write a C program to search a name in a list of names using binary search technique. (08 Marks)
- c. Define the following :
 - (i) Actual parameter
 - (ii) Formal parameter
 - (iii) Global variable
 - (iv) Local variable. (04 Marks)

OR

- 6 a. What is function? Explain the types of function based on parameters with examples. (08 Marks)
- b. Explain any four string manipulation library functions with examples. (08 Marks)
- c. Write a C program to find factorial of the given number using recursion. (04 Marks)

Module-4

- 7 a. What is structure? How structure is different from an array? Explain declaration and initialization of structure with syntax and example. (08 Marks)
- b. Write a C program to pass structure variable as function argument. (07 Marks)
- c. What is a file? Explain fopen and fclose functions. (05 Marks)

OR

- 8 a. Write a C program to read the contents from the file called abc.txt, count the number of characters, number of lines and number of white spaces and output the same. (10 Marks)
- b. Explain with an example how to create a structure using "typedef". (05 Marks)
- c. Explain fprintf and fscanf functions with syntax. (05 Marks)

Module-5

- 9 a. What is Pointer? Write a C program using pointer to find the sum, mean and standard deviation of all elements stored in an array of 'n' real numbers. (08 Marks)
- b. What is preprocessor directive? Explain any two preprocessor directive in C with examples. (06 Marks)
- c. Explain the following C functions with syntax and example: (06 Marks)
- (i) malloc ()
 - (ii) calloc ()
 - (iii) realloc ()

OR

- 10 a. Explain the array of pointers with example. (04 Marks)
- b. What are primitive and non-primitive data types? Explain. (06 Marks)
- c. Explain the following data structures along with their applications: (10 Marks)
- (i) Stack
 - (ii) Queue
 - (iii) LinkedList
 - (iv) Trees
