

## Unit-I

- Explain the control statements in 'C' language with an example?
- What is meant by compilation? Explain in detail?
- What are the C keywords? Elaborate them?
- Explain the types of operators available in C?
- Differentiate between compiler and interpreter?
- Differentiate between if-else-if ladder and switch statement?
- Explain with suitable examples the following statements in C:  
i) break ii) continue iii) goto
- Explain and specify interactions between various components that support the basic functionality of computer.
- What are the different types of errors one can encounter during the program execution?
- What is an identifier? What are the naming rules for identifiers in C?
- List different categories of C operators based on their functionality? Give examples?
- Explain different types of coding constants in a C?
- Differentiate between application software and system software?
- Briefly discuss various computing environments with neat diagrams?
- What do you mean by operator precedence and associativity? How one can override the precedence defined by C language? Give illustrative examples?
- Explain the structure of a C program?
- Discuss in detail the program execution steps?
- List the basic data types, their sizes and range of values supported by 'C' language?
- Describe the purpose of commonly used conversion characters in scanf() function?
- Define type conversion? Explain briefly about implicit and explicit type conversions.

- Explain various looping statements in ‘C’ language with example?
- Write a complete C Program to print all the prime numbers between 1 and n. Where ‘n’ is the value supplied by the user.
- Write a complete C program that reads a value in the range 1 to 12 and print the name of that month and the next month: Print error for any other input value. (For example, print “May followed by June” if the input is 5. Note that December is followed by January).
- Write a complete C Program to read ten integers and find:
  - (i) The number of even integers and their sum, and
  - (ii) The number of odd integers and their sum.
- Write a C program with Exclusive OR operation between the two integers and display the result?

## Unit-II

- What is an array? What are different types of array? Explain with examples?
- Define Recursion? Write a C-Program to find the factorial of a number using Recursion?
- Differentiate between call by value and call by reference with suitable examples?
- Explain different categories of functions in C with simple illustrative examples?
- What are the different ways in which 1-dimensional arrays can be declared and initialized?
- Explain inter function communication with example programs.
- Explain the facilities provided by the C preprocessor with examples.
- What are command line arguments? Illustrate their use with a simple C program.
- Explain the following storage classes with examples: auto, register, extern and static.
- Explain how two dimensional arrays can be used to represent matrices. Write C code to perform matrix addition and matrix multiplication.
- Write a C program to swap two integers using functions.

- Develop a C Program for multiplying two matrices.
- Write a 'C' program using functions to check whether the given 3x3 matrix is Symmetric or not?
- Consider the function *maxpos* that has two parameters: *int maxpos(int arr[], int n)* *n* is greater than or equal to 1, but less than or equal to the size of the array *arr*. Code the function *maxpos* to return the position of the first maximum value among the first *n* elements of the array *arr*.
- What is recursion? Write a complete C program that reads a positive integer N, compute the first N Fibonacci numbers using recursion and print the results. Illustrate how the results are computed when the value of N is 4?
- Write a C program using recursion for finding GCD (Greatest Common Divisor) of two given numbers?
- Explain how matrices can be represented using two dimensional arrays. Explain with code how Transpose of a matrix can be done.
- Write the C function *int minpos (float x[], int n)* that returns the position of the first minimum value among the first *n* elements of the given array *x*.
- Write a complete C program to do the following: Read data to fill a two dimensional array *int table [4] [4]*. Then print the sum of each column and sum of each row.
- Write a complete C program to perform these functions:
  - (i) to return the factorial of the given number using recursion, and
  - (ii) to return the factorial of the given number using iteration.

### Unit-III

- Explain how strings are declared and initialized in 'C'?
- Discuss the different arithmetic operations with pointers? Explain the comparison of two pointers?
- Describe the features of pointers? Explain an array of pointer with an example?
- Explain the following:
  - i) Array of pointers
  - ii) Malloc function.
- Demonstrate command-line arguments using a simple program? Explain?

- Explain the syntax with suitable examples the dynamic memory allocation functions available in C?
- Differentiate between a pointer and a variable? How a pointer is declared and initialized? What do you mean by pointer to another pointer?
- What are the arithmetic operators that are permitted on pointers?
- Discuss briefly the following pointers.
  - I. Pointer pointing to a variable
  - II. Pointer pointing to a constant
  - III. Constant pointer pointing to a variable
  - IV. Constant pointer pointing to constant
- Write a C function to find the length of a string passed as an argument?
- Write a C function to convert the string passed as an argument to its uppercase equivalent?
- Write a 'C' function to reverse the string passed as an argument that cannot be altered?
- Write a C program to accept string using character pointer and display it?
- Write a complete C program that displays the position or index in the string S where the string T begins. The program displays -1 if S does not contain T. For example, if S is "information processing" and T is "process", the value displayed is 12. The strings S and T are supplied by the user.
- Write a complete C program that reads a string and prints if it is a palindrome or not.
- Write a C program to display all the elements of an array using a pointer?

## Unit-IV

- Explain the following with examples:
  - a) Self referential structures
  - b) Typedef
  - c) Enumerated types.
- Explain the following with examples:
  - a) Pointers to structures
  - b) Nested structures
  - c) Array of structures
  - d) Unions
- Differentiate between structures and unions?

- What is a structure? Give its advantage? Give an example of creating and accessing members of a structure?
- What do you mean by bit fields? How bit fields are different from structures?
- How many possible ways one can access the members of a structure using a structure variable and a pointer to a structure variable? Illustrate with examples.
- Differentiate between Arrays of structures and structures containing arrays with suitable examples.
- What is a file? How to open and close different types of files in 'C'? Explain the possible modes of opening files? In all these modes what happens when the file doesn't exist and the file already exists?
- Explain what a text file is and what a binary file is.
- What is the purpose of the `ferror()` and `feof()` functions?
- What are the possible ways to set the file pointer to the beginning of the file?
- Explain syntax with illustrative examples the functions support reading and writing formatted data to and from files?
- Distinguish between `getc()` and `getchar()` functions?
- Explain the general format of `fseek()` function with illustrative examples?
- Write a 'C' program to read, write, add, subtract, multiply and divide two complex numbers? (Represent complex number using structures).
- Explain how complex numbers can be represented using structures. Write two C functions: one to return the sum of two complex numbers passed as parameters, and another to return the product of two complex numbers passed as parameters.
- Write a C program to count the number of words in a given file?
- Write a complete C program to reverse the first  $n$  characters in a file. The file name and the value  $n$  are specified on the command line. Incorporate validation of arguments: that is, the program should check that the number of arguments passed and also the value of  $n$  are meaningful
- Explain the different modes that can be provided as a parameter to the `fopen( )` function. Write a complete C program for the following: There are two input files named "first.dat" and "second.dat". The files are to be merged. That is, copy the content of "first.dat" and then the content of "second.dat" to a new file named "result.dat".

- Write a complete C program to copy data from one file to another file. The name of the source file and the name of the destination file are supplied by the user.
- Write a 'C' program to copy the contents of a file to another file?
- Write a C program to append the contents of a file to another file?
- Write a C program to count characters and lines in a given file?
- Write C-language program that reads a C-program file and outputs number of lines in the program.

### Unit-v

- Write a C program for linear search using functions without using recursion
- Illustrate the results of bubble sort for each pass, for the following initial array of elements: 68 67 99 33 122 200
- Explain what is stack and the operations performed on stack.
- Illustrate the results of bubble sort for each pass, for the following initial array of elements: 44 36 57 19 25 89 28
- An Array contains 3, 13, 7, 26, 44, 23, 98, and 57. Trace the steps using selection sort?
- What is a singly linked list? Explain with C code how the insertion, deletion and searching operations are performed on a singly linked list.
- Explain what is a queue and operations performed on queue. Provide C code for the same.
- Write an algorithm or C program for sorting integers in ascending order using selection sort. Illustrate the results for each pass of selection sort, for the following the initial array of elements: 23 78 45 8 32 56
- Write an algorithm or program for sorting integers using bubble sort. Show the bubble sort results for each pass for the following initial array of elements. 3 5 18 7 1 2 5 23 16 3 1
- Write a C program for binary search using functions without using recursion? An array contains 8, 13, 17, 26, 44, 56, 88, and 97. Trace the steps using binary search Algorithm.
  - I. To find value 88
  - II. To find the value 20
  - III. To find the value 8.