

# QUESTION BANK FOR DATA STRUCTURES USING C (16MCA11)

1. Explain unformatted I/O functions in C. Give proper examples.
2. Discuss formatted I/O functions in C with syntax and example.
3. If the three sides of a triangle are entered through the keyboard, write a program to check whether the triangle is equilateral or right angled triangle.
4. Explain the following with syntax and example:
  - (i) *if* statement
  - (ii) *else-if* ladder
  - (iii) *switch-case* statement
  - (iv) *for* loop
  - (v) *do – while* loop
5. Explain repetitive control structures in C.
6. Define an array. Explain initialization of 1-D and 2-D arrays with examples.
7. Explain any five built-in string handling functions with examples.
8. Write a program to find the roots of quadratic equation.
9. Write a program to find  $\sin(x)$  using the following series for a given accuracy and compare it with library function.
$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$
10. Write a program to check whether a given integer is prime or not.
11. Differentiate *while* loop and *do-while* loop with suitable example.
12. Find the value of  $f$  using the following series for a given accuracy,  $r$ :

$$f = \sqrt{\frac{6}{1^2} + \frac{6}{2^2} + \frac{6}{3^2} + \frac{6}{4^2} + \dots + \frac{6}{r^2}}$$

13. Write a program to check whether a string is palindrome or not, without using any built-in string functions.
14. Write a program to reverse the contents of an integer array without using another array.
15. Explain the need for user-defined functions.
16. Write a program to find product of two matrices of order  $m \times n$  and  $n \times p$  respectively. Write different functions to read matrix, display matrix and to multiply two matrices.
17. Define a pointer. How do you access variables using pointer? Explain with examples and memory map.
18. Write a program to find trace and norm of a matrix.
19. Without using built-in functions, write a programs
  - a. to concatenate two strings
  - b. to find length of the string
  - c. to compare two strings
  - d. to reverse a string
  - e. to copy content of one string to another
20. What do you mean by user-defined functions? Give syntax.
21. Write a program to find average of  $n$  numbers by passing array to a function.
22. Write a program to implement the concept of pointer to a function.
23. How to return a pointer from a function? Explain with an example.
24. What are the different techniques for passing arguments to a function? Explain with example programs.
25. Define a structure with its syntax. Give an example.

26. Create a structure STUDENT with members: *name* and *marks*. Write a program to read *n* number of students and to calculate average marks.
27. Define a structure called CRICKET that has member variables *player name*, *team name* and *batting average*. Declare an array of CRICKET with 50 elements. Write a program to read *n* number of players and display the same.
28. Write a program to find sum and average of elements stored in an array using pointers.

**DS Part:**

1. Define Abstract data type. What are the different parts of an ADT? Write the ADT for an array.
2. Describe complex numbers as an ADT which supports addition and subtraction operations.
3. Write an ADT for creating rational numbers and for various operations on rational numbers.
4. Define data structures. Explains primitive, linear and non-linear data structures
5. What do you mean by sequences? What are different ways of representing sequences as a value definition in ADT? Explain.