



CBCS SCHEME

18EC643

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USN

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Data Structures Using C++

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain the pillars of Oops. (06 Marks)
b. Define Operator overloading. Explain with C++ program. (08 Marks)
c. With example summarize the different data types used in C++ (06 Marks)

OR

- 2 a. Illustrate different types of inheritance with example. (06 Marks)
b. Write a C++ program that input two numbers and output the largest number using class. (08 Marks)
c. Define Polymorphism. Explain the concept of recursion with example. (06 Marks)

Module-2

- 3 a. Define Array. Write a C++ program for sparse matrix representation with example (using single linear list). (10 Marks)
b. Analyze how dynamic memory allocation is performed in C++? Explain with example. (10 Marks)

OR

- 4 a. Define Singly linked list. Explain the operation in singly linked list with C++ program. (10 Marks)
b. Analyze with example of vector representation. (10 Marks)

Module-3

- 5 a. Apply the concept of stack on tower of Hanoi problem and give solution for same. (10 Marks)
b. Write a abstract data type for stack. (06 Marks)
c. Write a note on linked representation of a stack. (04 Marks)

OR

- 6 a. Build C++ program to implement a stack using singly linked list. (10 Marks)
b. Convert the following : infix to postfix expression : (A+B) x (C - D) \$. (06 Marks)
c. Explain briefly stacks parentheses matching. (04 Marks)

Module-4

- 7 a. Define Queues. Explain method for push and pop for linked Queue. (10 Marks)
b. Summarize problem description and solution strategy for rail road car arrangement. (10 Marks)

OR

- 8 a. What is Dictionary? Also mention the operation to be performed on dictionaries. (10 Marks)
b. Define Priority Queue. Explain the implementation of Priority Queues in C++. (10 Marks)

Module-5

- 9 a. Define Complete binary tree. Explain properties of binary tree and how do we represent binary tree in detail. (10 Marks)
b. Explain different traversal methods of binary tree with example. (10 Marks)

OR

- 10 a. List applications of heap. Write a program to initialize a max heap. (10 Marks)
b. Briefly explain binary search tree implementation and operations with suitable example. (10 Marks)

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