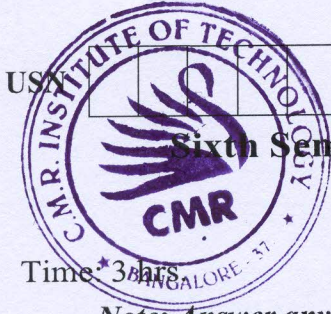


CBCS SCHEME



18EC643

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Sixth Semester B.E. Degree Examination, June/July 2024

Data Structures using C++

Time: 3 hours

Max. Marks: 100

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

Module-1

- a. Explain recursion. Write a recursive function in C++ to find the factorial of a number. (10 Marks)
b. Discuss Template functions in C++. Write template function to swap two parameters with arguments being two integers or two float values. (10 Marks)

OR

- a. Explain inheritance. Explain different types of Inheritance. (10 Marks)
b. Explain polymorphism. Explain different types of polymorphism. (10 Marks)

Module-2

- a. Explain how new and delete operators are used for dynamic memory allocation. (05 Marks)
b. Discuss the need for row and column mapping. Explain with example. (05 Marks)
c. What are special matrices? Explain with example. (10 Marks)

OR

- a. Write a C++ program to add 2 matrices. (10 Marks)
b. What do you mean by linked lists? Explain the concept of insertion and deletion of nodes of linked lists using C++. (10 Marks)

Module-3

- a. Explain how parenthesis matching is carried out using stack. Write C++ function for the same. (12 Marks)
b. Write C++ abstract class for stack. (08 Marks)

OR

- a. Develop a C++ template class to implement stack in linked representation. Define member functions for push and pop operation. (10 Marks)
b. Describe Towers of Hanoi problem and give the solution for the same. (10 Marks)

Module-4

- a. Write a method for push and pop for linked queue. (10 Marks)
b. What is dictionary? Discuss various operations on dictionaries. (10 Marks)

OR

- a. Write short notes on hashing. (10 Marks)
b. Discuss problem description and solution strategy for rail road car management. (10 Marks)

Module-5

- a. Write functions for preorder traversal of binary tree and in order traversal of binary tree. (10 Marks)
b. Write a function to search for an element in binary search tree. (10 Marks)

OR

- a. Write a C++ function to delete elements from max heaps. (10 Marks)
b. Briefly describe array based and linked representation of a binary tree with examples. Write a C++ member function height linked binary tree class to determine height of binary tree. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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