CBCS SCHEME

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18EC643

Sixth Semester B.E. Degree Examination, June/July 2024
Data Structures using C++

Time: 3 hrs. Max. Marks: 100

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

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.

Module-1

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

2 a. Explain inheritance. Explain different types of Inheritance. **(10 Marks)**

b. Explain polymorphism. Explain different types of polymorphism. **(10 Marks)**

Module-2

3 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

4 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

5 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

6 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

7 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

8 a. Write short notes on hashing. **(10 Marks)**

b. Discuss problem description and solution strategy for rail road car management. **(10 Marks)**

Module-5

9 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

10 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)**

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