

CBCS SCHEME

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18EC643

Sixth Semester B.E. Degree Examination, July/August 2022 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 structure of C++ program. (06 Marks)
- b. Explain different types of inheritance. (06 Marks)
- c. Write a C++ program that inputs two numbers and outputs the largest number using class. (08 Marks)

OR

- 2 a. Explain various control structures used in C++. (06 Marks)
- b. Explain function prototype. Explain the concept of call by value, call by reference of passing the parameters. (06 Marks)
- c. Explain Recursive. Write a recursive function in C++ to find factorial of a number. (08 Marks)

Module-2

- 3 a. Explain how a dynamic memory allocation or deallocation is performed using C++ with suitable examples. (06 Marks)
- b. Write a program in C++ to add two matrices. (06 Marks)
- c. Write a program in C++ to perform create, display operation on single linked list. (08 Marks)

OR

- 4 a. What is a linear list? Write the abstract class of linked list. (06 Marks)
- b. Write a program to store elements in array and then retrieve them. (06 Marks)
- c. What is sparse matrix? With a diagram explain the sparse matrix representation. (08 Marks)

Module-3

- 5 a. Using stack change the following infix to post fix expressions.
 $(A + B) * C - D * F + C$. (06 Marks)
- b. Write a C++ abstract for stack using arrays. (06 Marks)
- c. Write a program to explain the concept of towers of Hanoi problem using stack. (08 Marks)

OR

- 6 a. If the values of A, B, C, D are 2, 3, 4, 5 respectively, evaluate the values of the following expression. $AB * C - D$. (06 Marks)
- b. Develop a C++ template to implement stack in linked lists. (06 Marks)
- c. Explain how parenthesis matching is carried out with stack using C++ function. (08 Marks)

Module-4

- 7 a. Write ADT specification of queue. (06 Marks)
- b. What is hashing? Explain the hashing function and tables. (06 Marks)
- c. Develop a C++ program for hash table to perform search and insert operations. (08 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.

OR

- 8 a. Give ADT for dictionary. (06 Marks)
b. Explain different collision resolution techniques in hashing. (06 Marks)
c. Write C++ program to perform various operations on linear queue using arrays. (08 Marks)

Module-5

- 9 a. Define binary tree. State and prove any two properties of binary trees. (06 Marks)
b. Draw a binary tree for the algebraic expressions.
 $[a + (b - c) * [(d - e)/(f + g - h)]]$. (06 Marks)
c. Write a C++ program to search a binary search tree. (08 Marks)

OR

- 10 a. Explain various traversal methods of binary tree. (06 Marks)
b. Write a C++ function to determine height of the tree. (06 Marks)
c. What is max heap? Write a program to initialize a max heap. (08 Marks)

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