CBCS SCHEME

USN | | | | | | | | | | |

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 charge 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 reactively, 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)**

OR

8	a.	Give ADT for dictionary.	**(06 Marks)**
	b.	Explain different collision revolution 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)**

* * * * *