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18EC643

Sixth Semester B.E. Degree Examination, Dec.2024/Jan.2025
Data Structure 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 with example pillars of C++ programming.   **(10 Marks)**
    b.   Explain the complete structure of C++ programming and write a C++ program to swap 2 numbers.   **(10 Marks)**

OR

2   a.   Explain the concept of constructor and destructor with simple example.   **(10 Marks)**
    b.   Explain recursion with simple example.   **(05 Marks)**
    c.   Explain briefly the concept of polymorphism.   **(05 Marks)**

Module-2

3   a.   Define array. Also explain the concept of row-major and column – major mapping array.
                                                                                           (08 Marks)
    b.   Explain dynamic memory allocation with example.   **(06 Marks)**
    c.   With a C++ program to add 2 matrices.   **(06 Marks)**

OR

4   a.   Explain with example of abstract data type linear list and abstract class linear list.   **(10 Marks)**
    b.   Explain with diagram singly linked lists and chains.   **(10 Marks)**

Module-3

5   a.   Explain stack and its applications.   **(04 Marks)**
    b.   Briefly explain array representation of stack with example.   **(08 Marks)**
    c.   Explain linked representation of stack.   **(08 Marks)**

OR

6   a.   Define problem description of tower of Hanoi and write a program to explain the concept of tower of Hanoi using stack.   **(10 Marks)**
    b.   Write a C++ code to convert infix expression to postfix expression.   **(10 Marks)**

Module-4

7   a.   Explain ADT specification of queue.   **(06 Marks)**
    b.   Write C++ program for hash table to perform search and insert operation.   **(10 Marks)**
    c.   Write a note on class ArrayQueue.   **(04 Marks)**

OR

8	a.	Define dictionary. Explain operation to be performed on dictionaries.	(07 Marks)
	b.	Write a note on linear list representation of dictionaries.	(05 Marks)
	c.	Briefly explain different collision revaluation technique in hashing.	(08 Marks)

Module-5

9	a.	Explain all properties of binary tree and array representation of binary tree.	(07 Marks)
	b.	Write a C++ program to search a binary search tree.	(08 Marks)
	c.	Write a note on binary tree traversal operation.	(05 Marks)

OR

10	a.	Explain with operation of ADT binary tree.	(07 Marks)
	b.	Write a C++ program to determine height of binary tree.	(06 Marks)
	c.	Describe heap technique and explain heap sorting with relevant diagram.	(07 Marks)

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