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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: EI / ML **Duration: 3 hrs.**
Course Code: 19EI5PE1CD / 19ML5PEIDS **Max Marks: 100**
Course: C++ AND DATA STRUCTURES **Date: 07.03.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a)	Describe the salient concepts of Object Oriented programming language.	**06**
	b)	Explain different types of manipulators with suitable example.	**04**
	c)	Explain the concept of inline functions and under what circumstances such functions cannot be used? Write a simple program to illustrate the concept.	**05**
	d)	What are reference arguments? Write a program to pass simple datatype by reference.	**05**

UNIT - II

2	a)	Write a C++ program to accept an array, display the array and determine the mean, largest and sort in ascending order using class Array.	**07**
	b)	What are constructors and destructors? Explain how they differ from normal function. Illustrate with example.	**08**
	c)	Develop a C++ program to add two complex numbers by overloading the operator **'+'**.	**05**

UNIT - III

3	a)	Suggest a C++ program to implement the following class hierarchy as shown in Fig.2. Assume the relevant data members and member functions.	**08**

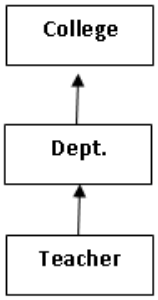

Fig.2

	b)	Discuss template functions in C++. Write template function to swap two parameters with arguments being two integers or two float values.	**06**
	c)	What is an Exception handling? Write a program to demonstrate the exception handling in C++ by using try catch blocks.	**06**

UNIT - IV

4	a)	Explain different forms of get() functions. Illustrate any two with a C++ program.	**06**
	b)	Describe various file mode operations available in C++ program.	**07**
	c)	Explain how two-dimensional arrays are represented in memory with an example.	**07**

OR

5	a)	Explain the classification of data structures.	**06**
	b)	Develop an algorithm to insert an element in a linear array with an example.	**07**
	c)	Write a program to sort a given array of numbers using bubble sort algorithm.	**07**

UNIT - V

6	a)	Write C++ abstract class for Stacks.	**06**
	b)	Describe the simple Queue implantation using linked lists.	**07**
	c)	Write a program to search for given element in a sorted array using Binary Search Trees.	**07**

OR

7	a)	With respect to the application of stack explain towers of Hanoi.	**10**
	b)	What are the various ways of Insertion Algorithms used to insert nodes into linked list. Propose a suitable algorithm to insert a node at the beginning of the list and justify the same with example.	**10**

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