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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: Electronics & Telecommunication Engineering **Duration: 3 hrs.**

Course Code: 19ET5PE1DS **Max Marks: 100**

Course: C++ and Data Structures **Date: 03.03.2023**

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)	Write a program to generate and display Fibonacci numbers 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89.	**06**
	b)	Write a function to find largest of three numbers. Demonstrate the working with sample input/output.	**06**
	c)	What do you mean by function overloading? Develop a C++ program to compute the area of circle, rectangle and triangle (given with 3 sides) by overloading the area () function.	**08**

UNIT - II

2	a)	What is copy constructor? When do we have to use copy constructors?	**06**
	b)	Write a C++ program to add two Complex numbers using operator overloading.	**08**
	c)	Illustrate with an example, how endl and setw manipulator works	**06**

UNIT - III

3	a)	Explain different types of inheritances in C++ with diagram.	**06**
	b)	Explain the ambiguity caused during multiple inheritance with an example program and how can the ambiguity be resolved.	**07**
	c)	What is an exception? Explain how exceptions are handled in C++, with the help of an example program. When do we use multiple catch handlers?	**07**

UNIT - IV

4	a)	Realize a stack that can be used to perform push and pop operations using singly linked list. Give sample output.	**10**
	b)	Write C++ functions to implement the following (main program not required) (i) Search an item in a linked list (ii) Reverse the items of linked list	**10**

OR

5	a)	Write codes to demonstrate any one application (your choice) of a queue**.** State the objective of the application, followed by codes and sample input/output.	**10**
	b)	Write a program starting from class node to add and delete an element in a singly linked list.	**10**

UNIT - V

6	a)	Describe Heap sort Algorithm in detail for the following array (code not required) Array [ ] = {5, 4, 8, 2, 9, 6, 13}	**10**
	b)	Given a set of elements create a hash table using the algorithm k mod n, where n=9. Consider the keys 19, 45, 73, 27, 58, 66, 9, 5, 70, 94, 32, 8, 12, 15, 20, 91, 87, 63. Demonstrate both open and closed hashing.	**10**

OR

7	a)	What is the difference between skip list and linked list? Illustrate the working of skip list and also the types of operations in the skip list	**10**
	b)	What is complete binary tree? Explain the tree traversal techniques for a binary tree.	**10**

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