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

Autonomous Institute Affiliated to VTU

April 2025 Semester End Make-Up Examinations

Programme: B.E. **Semester: III**

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

Course Code: 23ET3ESCDS **Max Marks: 100**

Course: C++ AND DATA STRUCTURES

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

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Write a program to find the largest of three numbers using a simple if-else statement.	*CO2*	*PO1*	**08**
	b)		Write a program to demonstrate the use of a switch case for a basic calculator.	*CO2*	*PO1*	**08**
	c)		Explain the principles of Object-Oriented Programming (OOP). Discuss the differences between procedural and object-oriented programming paradigms.	*CO1*		**04**
			OR			
2	a)		Write a program to check whether a given number is a palindrome using loops.	*CO2*	*PO1*	**08**
	b)		Write a program to print the Fibonacci series up to n terms using recursion.	*CO2*	*PO1*	**08**
	c)		Explain the significance of tokens in C++ and describe different types of tokens with examples.	*CO1*		**04**
			UNIT - II			
3	a)		Write a C++ program to demonstrate the use of a copy constructor.	*CO2*	*PO1*	**08**
	b)		Write a program to overload the binary + operator for adding two complex numbers.	*CO2*	*PO1*	**08**
	c)		Discuss the purpose of constructors and destructors in C++ with examples.	*CO1*		**04**
			OR			
4	a)		Write a program to implement a parameterized constructor that initializes employee details (name, ID, and salary).	*CO2*	*PO1*	**08**
	b)		Write a program to format the console output using manipulators like `setw`, `setprecision`, and `endl`.	*CO2*	*PO1*	**08**
	c)		Explain dynamic initialization of objects with an example.	*CO1*		**04**

			UNIT - III			
	5	a)	Write a program to implement single inheritance where a derived class calculates the total marks of a student.	*CO2*	*PO1*	**08**
		b)	Write a program to demonstrate the use of function templates to swap two variables of any data type.	*CO2*	*PO1*	**08**
		c)	Explain the concept of a virtual base class with an example.	*CO1*		**04**
			OR			
	6	a)	Write a program to demonstrate polymorphism using virtual functions.	*CO2*	*PO1*	**08**
		b)	Write a program to handle exceptions where the user tries to divide a number by zero.	*CO2*	*PO1*	**08**
		c)	Discuss different types of inheritance in C++ with suitable examples.	*CO1*		**04**
			UNIT - IV			
	7	a)	Write a program to implement a stack using an array and perform basic stack operations like push and pop.	*CO2*	*PO1*	**08**
		b)	Write a program to implement a queue using a linked list.	*CO2*	*PO1*	**08**
		c)	Explain the difference between stacks and queues. Discuss their applications.	*CO1*		**04**
			OR			
	8	a)	Write a program to check for balanced parentheses in an expression using a stack.	*CO2*	*PO1*	**08**
		b)	Write a program to implement a circular queue using an array.	*CO2*	*PO1*	**08**
		c)	Discuss the advantages of linked representation over array representation for stacks and queues.	*CO1*		**04**
			UNIT - V			
	9	a)	Write a program to implement a hash table using linear probing.	*CO2*	*PO1*	**08**
		b)	Write a program to construct a binary tree and perform in-order traversal.	*CO2*	*PO1*	**08**
		c)	Explain the advantages and limitations of using hash tables.	*CO1*		**04**
			OR			
	10	a)	Write a program to demonstrate the insertion operation in a skip list.	*CO2*	*PO1*	**08**
		b)	Write a program to perform pre-order traversal of a binary tree using recursion.	*CO2*	*PO1*	**08**
		c)	Compare binary trees and hash tables. Discuss their applications.	*CO1*		**04**

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