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

Autonomous Institute Affiliated to VTU

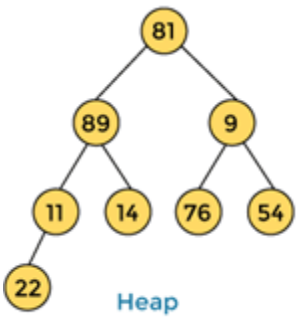
January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Electronics and Telecommunication Engineering **Duration: 3 hrs.**
Course Code: 22ET5PE1DS **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 check whether an integer is odd or even using ternary operator. Demonstrate the working of the program with a sample input and output	*CO2*	*PO1*	**06**
	b)		Write a program to find the N^{th} Fibonacci number using recursion (the sequence is 1, 1, 2, 3, 5, 8 and so on). Demonstrate the working of the program to find 12^{th} Fibonacci number	*CO2*	*PO1*	**07**
	c)		Write a C++ class with relevant members and functions to find the area and volume of a room. Demonstrate the working of the class by creating an object and invoking the functions.	*CO2*	*PO1*	**07**
			OR			
2	a)		List the features of C++ and explain them in brief.	*CO1*		**10**
	b)		Write a C++ code to create a class called STUDENT. Add two data members NAME and USN. Include two member functions GETDATA( ) and PUTDATA() to read and display the data members respectively. Define one of the member function inside the class body and other member function outside the class body. Create a main program and access the member functions.	*CO2*	*PO1*	**10**
			UNIT - II			
3	a)		Write a class "student" with roll_no, name and fee as members. Demonstrate the working of copy constructor with the "student" class. Use any additional display functions if required.	*CO2*	*PO1*	**07**
	b)		Write a program to demonstrate overloading of operator '++', as prefix and postfix.	*CO2*	*PO1*	**07**
	c)		Write a program to demonstrate the working of a destructor in C++ class.	*CO2*	*PO1*	**06**
			OR			
4	a)		Write a C++ code to demonstrate the following (i) Default constructor (ii) Parameterized constructor (iii) Copy constructor	*CO2*	*PO1*	**10**

		b)	What is overloading of the operators? Write a C++ code to demonstrate the binary operator overloading	*CO2*	*PO1*	**10**
			UNIT - III			
	5	a)	Write a program to demonstrate the ambiguity which may arise in multiple inheritance. Analyze the problem and propose a solution to overcome the problem.	*CO2*	*PO1*	**07**
		b)	Write a program to demonstrate the usage of this pointer.	*CO2*	*PO1*	**06**
		c)	Write a program to handle division by zero exception.	*CO2*	*PO1*	**07**
			OR			
	6	a)	Demonstrate the use of virtual functions with the help of a suitable C++ program	*CO2*	*PO1*	**10**
		b)	Write a sample C++ code to demonstrate exception handling with respect to try, catch, throw and rethrow.	*CO2*	*PO1*	**10**
			UNIT - IV			
	7	a)	Write a program to insert and delete node in a linked list	*CO2*	*PO1*	**10**
		b)	Write a program to implement stacks using arrays	*CO2*	*PO1*	**10**
			OR			
	8	a)	Design a hash table with function h(k) = 3k + 2 and modulus m = 10. Demonstrate the working of the table with at least 13 elements for both closed and open hashing.	*CO2*	*PO1*	**10**
		b)	With the help of a binary tree with at least 15 nodes, demonstrate in-order, pre-order and post-order traversal	*CO2*	*PO1*	**10**
			UNIT - V			
	9	a)	Write a program to demonstrate the working of Tower of Hanoi. Demonstrate the working with relevant diagrams.	*CO2*	*PO1*	**10**
		b)	Write a program to check for balanced parentheses using stack.	*CO2*	*PO1*	**10**
			OR			
	10	a)	From the heap shown below, find the max heap and min heap. At each step, write the full heap to demonstrate the placement of elements.  Heap	*CO2*	*PO1*	**10**
		b)	Write a program to demonstrate bin sort to sort an array	*CO2*	*PO1*	**10**

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