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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: Medical Electronics Engineering **Duration: 3 hrs.**

Course Code: 22MD5PCDSA **Max Marks: 100**

Course: Data Structures and Algorithms

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)	List the difference between procedure oriented and object oriented programming? Also explain how C++ is more advanced than C programming .	*CO1*	*PO1*	**10**
	b)	Elaborate on the different set of data types available in C++ programming.	*CO1*	*PO1*	**06**
	c)	Write a C++ program to find the factorial of a number using recursive function	*CO1*	*PO1*	**04**
		OR			
2	a)	Enumerate the features of object oriented programming? Explain them in detail.	*CO1*	*PO1*	**08**
	b)	What is the role of enumerated data type in C++ programming? Elaborate on it with an example.	*CO1*	*PO1*	**06**
	c)	Write a C++ program to get the output as shown below with the help of a structure named as STARDISPLAY OUTPUT:- ********** Data type Range ********** char -128 to 127 short -32,768 to 32,767 int System dependent long -2,147,483,648 to 2,147,483,647 **********	*CO1*	*PO1*	**06**

			UNIT - II			
	3	a)	Define constructor. Explain the different types of constructors with suitable example.	*CO2*	*PO2*	**10**
		b)	Enumerate the characteristics of constructor?	*CO2*	*PO2*	**06**
		c)	How to make private member inheritable in C++ program? Explain with an Example.	*CO2*	*PO2*	**04**
			OR			
	4	a)	Write a C++ program to depict the overloading of unary operator	*CO2*	*PO2*	**10**
		b)	Define Inheritance? Explain any 3 forms of inheritance with an example.	*CO2*	*PO2*	**10**
			UNIT - III			
	5	a)	Classify the data structure and elaborate on them.	*CO3*	*PO3*	**08**
		b)	Define sorting and list its types..	*CO3*	*PO3*	**04**
		c)	Explain the working of Bubble sort. Also write a C++ program to depict the bubble sorting method.	*CO3*	*PO3*	**08**
			OR			
	6	a)	Create a Quick Sorting program and outline its benefits.	*CO2*	*PO2*	**10**
		b)	Illustrate the concept of Insertion sort algorithm with suitable example.	*CO2*	*PO2*	**10**
			UNIT - IV			
	7	a)	Illustrate the operations associated with Queue with suitable example.	*CO3*	*PO3*	**10**
		b)	Write a C++ program to insert a number in a binary tree search operation	*CO3*	*PO3*	**10**
			OR			
	8	a)	Explain the different operations performed in stack function with an example	*CO1*	*PO1*	**10**
		b)	Differentiate between queue and circular queue write a C++ program to implement queue operations.	*CO1*	*PO1*	**10**
			UNIT - V			
	9	a)	Explain the following i. Big oh notation ii. Big omega notation	*CO4*	*PO3*	**10**
		b)	Explain the following i. General Plan for Analyzing the Time Efficiency of Nonrecursive Algorithms ii. Worst, best and average case efficiencies	*CO3*	*PO3*	**10**

			OR			
	10	a)	How does the following notations are useful in data structures and algorithm? i. Big oh notation ii. General plan for analyzing the time efficiency of recursive algorithms	*CO3*	*PO3*	**10**
		b)	Perform the analysis of non-recursive algorithms mathematically.	*CO3*	*PO3*	**10**

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