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: EIE / EEE   **Duration: 3 hrs.**

Course Code: 23EI5PE1CD / 23EE5PE1CD / 22EI5PE1CD   **Max Marks: 100**

Course: C++ & 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.

			MODULE - I	*CO*	*PO*	**Marks**
	1	a)	Enumerate the core concepts of Object-Oriented Programming (OOP). Briefly explain two of these concepts in your own words.	*CO1*	*PO1*	**06**
		b)	What are the key differences of using an Object-Oriented Programming approach over traditional procedural programming	*CO1*	*PO1*	**06**
		c)	Suggest a suitable C++ program that effectively showcases pass by reference and pass by pointers mechanisms and summarize the execution of the program.	*CO2*	*PO3*	**08**
			OR			
	2	a)	Explain the concept of inline functions in C++. Write a simple C++ program to demonstrate the use of an inline function and briefly discuss the potential benefits and drawbacks of using inline functions.	*CO2*	*PO2*	**07**
		b)	Explain the structure of C++ program	*CO1*	*PO1*	**06**
		c)	Suggest a C++ program that exemplifies the concept of function overloading by creating functions with the same name but different parameter lists to perform distinct operations	*CO2*	*PO3*	**07**
			MODULE - II			
	3	a)	Suggest a suitable C++ program to illustrate static data members and static member functions within a class.	*CO3*	*PO2*	**07**
		b)	Explain the concept of constructor overloading using a simple C++ program	*CO3*	*PO1*	**07**
		c)	Develop a C++ program to maintain the database of employees of an organization. Summarize the execution of the program.	*CO3*	*PO3*	**06**
			OR			

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.

				CO	PO	Marks
4	a)	Explain the rules and guidelines for operator overloading in C++	CO3	PO1	05
	b)	Design a C++ program to perform add, subtract and multiply operation using operator overloading.	CO3	PO3	08
	c)	Describe the role of dynamic constructors and destructors in memory management using a C++ code.	CO1	PO1	07
		MODULE - III			
5	a)	Enumerate the different types of inheritance and explain any two types with suitable diagrams and syntax.	CO3	PO1	07
	b)	Develop a simple C++ program to establish how pointers can be used to access objects.	CO3	PO2	06
	c)	Justify the use of new and delete operators in OOPS using a C++ code.	CO1	PO1	07
		OR			
6	a)	Explain the concept of overloading of function templates using a suitable C++ program.	CO3	PO1	07
	b)	Explain the base class and derived class visibility modes available in C++ programming language	CO3	PO1	06
	c)	Develop a C++ program that exemplifies the utilization of hybrid inheritance. Summarize the execution of the program.	CO3	PO2	07
		MODULE - IV			
7	a)	Explain opening of files using constructors	CO4	PO1	05
	b)	Develop a suitable algorithm to sort the elements of an array and validate with an example.	CO4	PO3	10
	c)	Enumerate the desirable properties of an algorithm	CO4	PO1	05
		OR			
8	a)	Develop a suitable C++ code to insert and delete first node in a singly linked list and summarize the execution of the program.	CO4	PO3	10
	b)	Suggest an algorithm to perform insertion and deletion operation in a doubly linked list and justify the same with an example.	CO4	PO3	10
		MODULE - V			
9	a)	Propose a suitable algorithm to perform Push and Pop operations on linked list implementation of stacks and justify the same with suitable diagrams.	CO4	PO3	12
	b)	Enumerate the various applications of stacks and explain any one.	CO4	PO1	08
		OR			
10	a)	Describe the key terminologies associated with tree data structures with the help of a diagram.	CO4	PO1	12
	b)	Enumerate the different tree traversal methods and write a suitable algorithm for any one method.	CO4	PO2	08

******