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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: III**

Branch: Information Science and Engineering **Duration: 3 hrs.**

Course Code: 23IS3PCOOP / 22IS3PCOOP / 19IS3PCOOP **Max Marks: 100**

Course: Object Oriented Programming using C++

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

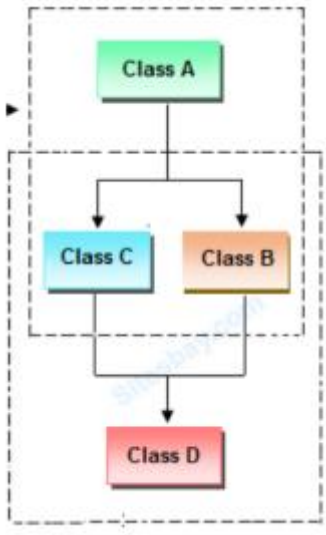
Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Elucidate the features of OOPS.	*CO2*	*PO1*	**8**
	b)		In a Banking Application, you need to implement a class BankAccount with basic functionality to deposit and withdraw funds. However, there is a condition: when a withdrawal is requested, the balance should not go below zero. If the withdrawal is more than the available balance, it should display an error message. **Implement a class BankAccount with:** 1. Private attributes for balance. 2. Functions deposit() and withdraw(). 3. An error message when an invalid withdrawal attempt is made.	*CO1*	*PO1*	**6**
	c)		What are access specifier? How are they used to protect data in C++? Justify.	*CO2*	*PO1*	**6**
			OR			
2	a)		Write a C++ program to illustrate array of objects in an employee management system.	*CO2*	*PO1*	**8**
	b)		Write a C++ program to illustrate the reference variable.	*CO3*	*PO3*	**6**
	c)		Differentiate Structure and Classes with suitable example.	*CO2*	*PO1*	**6**
			UNIT - II			
3	a)		In C++, can you define multiple functions within the same class that have the same name? Justify your answer with an appropriate example and explain the underlying concept.	*CO3*	*PO3*	**5**
	b)		What is the role of constructors in C++, and how do they differ from regular member functions? Provide examples to demonstrate	*CO1*	*PO1*	**8**

			the initialization of objects using default constructors, parameterized constructors, and copy constructors.			
		c)	With suitable C++ code demonstrate implementation of a friend function named FIND_MAX, which compares the integer data of two classes, **Funct1** and **Funct2**, and prints the maximum value found? Assume that both classes have a single integer data member.	***CO2***	***PO3***	**7**
			OR			
	4	a)	Write a C++ program, create class Matrix with member variables mat[10][10], row, column and member functions read_matrix(), print_matrix() and add(). Define all functions outside the class. The prototype of add() function is: void add(Matrix m1,Matrix m2); Illustrate the addition of two Matrices in the program.	***CO3***	***PO1***	**8**

		b)	class train
			{
			int id;
			char Name[];
			char source[];
			char dest[];
			};
			Write default constructors, parameterized constructors, and destructors for the given class.
				CO1	***PO2***	**5**

		c)	A counter is a variable that counts things. Maybe it counts file accesses, or the number of times the user presses the Enter key, or the number of customers entering a bank. Each time such an event takes place, the counter is incremented (1 is added to it). The counter can also be accessed to find the current count. Write a program to implement the same.	***CO3***	***PO3***	**7**
			UNIT - III			
	5	a)	Define operator overloading. Write a program to add and subtract two complex numbers by overloading the operators + and - with suitable messages.	***CO2***	***PO1***	**10**
		b)	Define Inheritance. Elucidate its types with syntax for each.	***CO1***	***PO1***	**10**
			OR			
	6	a)	Write a C++ program to compare objects of time class by overloading **>** operator. The members of the class Time are minutes, hours and seconds. Write necessary functions to read and display the time.	***CO3***	***PO2***	**10**

		b)	Write a C++ program to implement the inheritance given in the diagram.  	CO3	PO3	**10**
			UNIT - IV			
	7	a)	With help of examples, explain the following a) width() b) precision() c) fill() d) setf()	CO3	PO2	**10**
		b)	Create a base class media, derive two different classes book (Book-id, Book-name, publication, author, Book-price) and CD (cd-title, CD-price) from media. Write a program to accept and display information of both book and cd to implement run time polymorphism.	CO3	PO3	**10**
			OR			
	8	a)	Write a C++ program with a Class Complex that has two member variables to demonstrate pointer to objects.	CO1	PO1	**10**
		b)	Write a C++ program to create a class inventory with member variables name code and cost and member methods readdata() and writedata(). Write a driver function which creates object of this class and write the object to a file "STOCK.DAT" also read the file "STOCK.DAT" and write to the class object using write data method display the contents of the object.	CO3	PO3	**10**
			UNIT - V			
	9	a)	Elucidate the Standard Template Library and how it is working.	CO1	PO1	**6**
		b)	Write a C++ program to create a class template for illustrating stack of integers and print the total number of elements in the stack	CO3	PO3	**8**
		c)	Write a C++ program to accept user name and password and throw an exception if the password has less than 6 characters or does not contain a digit.	CO3	PO3	**6**

			OR			
	10	a)	Write a program using function template to sort an array element of numbers for integer array elements and floating-point array elements.	*CO3*	*PO3*	**7**
		b)	Elucidate Exception Handling Mechanism? Give an example for handling exception caused by division by zero with a code snippet.	*CO1*	*PO1*	**6**
		c)	Write a class template that demonstrates two generic data types being passed for the class template.	*CO3*	*PO3*	**7**

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