Question Paper

Exam Date & Time: 17-Jan-2024 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES
END SEMESTER THEORY EXAMINATIONS NOVEMBER/DECEMBER 2023
I SEMESTER B.Sc.(APPLIED SCIENCES) IN ENGG.
PROBLEM SOLVING USING COMPUTERS [ICS 111]

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

Missing data, if any, may be suitably assumed

1)		Explain memory hierarchy. Compare cache, ROM and register.	(3)
	A)		
	B)	Draw a flowchart to find sum of digits of a given number.	(3)
	C)	Write an algorithm to find all type of roots of a quadratic equation.	(4)
2)		Differentiate between entry control and exit control loops. [logical difference, example code, flow-chart]	(4)
	A)		
	B)	Write a complete C++ program to check whether a given string is a palindrome or not a palindrome.	(3)
	C)	Define a pointer. Write a complete C++ program to find sum of 1D array elements with the help of a pointer.	(3)
3)		Give snap shots of binary search of element 70 in the array: [Algorithm/ Program Not required	(5)
	A)	58, 62, 75, 88, 92, 105	
	B)	Write a complete C++ program using function, mat_cal(int b[n][n], int) to determine sum of second diagonal elements and norm of a given nxn matrix. [main( ) should perform reading of matrix and mat_cal(int b[n][n], int) calculate and display the result. Norm is defined as the square root of the sum of all the elements of the matrix.]	(5)
4)		Define a structure "Book" with data members: book_ID and price. Declare an array to hold n Books' record. Display the array in the sorted order on the basis of price. Write Complete C++ program to demonstrate the same.	(6)
	A)		
	B)	What is default argument function? Explain with the help of a complete C++ program.	(4)

5)	A)	Define a class "Complex" with data members: real, img and member functions: add( ) and display( ) [prototype : Complex add(Complex, Complex), void display(void)]. Write a complete C++ program to find sum of two complex numbers.	(6)
	B)	Define OOP characteristics: Encapsulation and static polymorphism with the help of example code.	(4)

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