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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Second Semester, B.E. - Semester End Examination; Sep. / Oct. - 2023

Introduction to C++ Programming

(Common to AI & ML, CS, and EE)

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Understand and design the solution to a problem using object-oriented Programming concepts.

CO2: Reuse the code with extensible Class types, User-defined operators and function Overloading.

CO3: Achieve code reusability and extensibility by means of Inheritance and Polymorphism.

CO4: Implement the features of C++ including templates, exceptions and file handling for Providing programmed solutions to complex problems.

Note: I) PART - A is compulsory. **Two** marks for each question.

II) PART - B: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
	I : PART - A	10			
1 a.	Explain the limitations of procedure oriented programming.	2	L1	CO1	PO1
b.	Write the output of the given code snippet; <pre>#include<iostream> using namespace std; int main () { int a = 0, b, num = 15; b = num%10; a = a + b; num = num/10; a= a+num; count<<a<< endl<< num; return 0; }</pre>	2	L3	CO2	PO1,2
c.	Analyze the code and write the output; <pre>#include<iostream> using namespace std; class student { private: int roll_no, marks; public: student () { roll_no = 0 marks = 0; } student (int r, int n= 0) { roll_no = r; marks = n; } };</pre>	2	L2	CO2	PO1,2

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void show_data( )
{
    cout<< "\n ROLL No =" << roll_no;
    cout<< "\n MARK =" << marks;
}
};
main( )
{
    student s1;
    s1.show_data( );
    student s2(3);
    s2.show_data( );
    student s3(5,98);
    s3.show_data( );
}

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|--|---|----|-----|-----|
| d. Define exception. How it is handled in C++? | 2 | L2 | CO3 | PO1 |
| e. Write the C++ stream classes hierarchy. | 2 | L2 | CO4 | PO1 |

II : PART - B	90
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UNIT - I	18
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|--|---|----|-----|-----|
| 2 a. List and explain the features of object oriented programming. | 9 | L2 | CO1 | PO1 |
| b. Write a C++ program to demonstrate the concept of arithmetic and relational operators. | 9 | L3 | CO1 | PO1 |
| c. Write a C++ program to find the sum of 'n' natural numbers using while and do while loop. | 9 | L3 | CO1 | PO1 |

UNIT - II	18
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|--|---|----|-----|-----|
| 3 a. Write a C++ program to add two number using call by value and call by reference. | 9 | L3 | CO1 | PO1 |
| b. Define inline function and explain with an example program. | 9 | L2 | CO1 | PO1 |
| c. Create a class called circle with one instance variable radius. Define methods to perform the following operations: | | | | |
| i) To find the circumference and area of the circle | 9 | L3 | CO1 | PO1 |
| ii) To print the same | | | | |
| Write a C++ program to implement above scenarios. | | | | |

UNIT - III	18
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|--|---|----|-----|-----|
| 4 a. Explain three types of constructors. | 9 | L2 | CO1 | PO1 |
| b. Explain single inheritances, multilevel inheritance and hybrid inheritance. | 9 | L2 | CO3 | PO1 |

- c. Create a base class called student with data-name, USN, Phone number. Write a method to read the data member values. Create a class called UG student and inherit base class. Read data for branch, semester and three subject marks. Write a method to read data, calculate average and print all the information of the student.

9 L3 CO3 PO1,2,3

UNIT - IV**18**

- 5 a. Write a C++ program to overload unary operator.
 b. Define operator overloading and explain binary operator overloading with an example.
 c. Write a C++ program to demonstrate usage of try, catch and throw to handle exception.

9 L3 CO3 PO1,2,3

9 L2 CO4 PO1

9 L3 CO4 PO1,2

UNIT - V**18**

- 6 a. Explain in detail three types of stream classes in C++.
 b. Write a C++ program to read few lines and then displaying each word in a different line using ofstream and ifstream.
 c. Explain binary files and operations performed on it.

9 L2 CO4 PO1

9 L3 CO4 PO1,2,3

9 L2 CO4 PO1

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