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RV COLLEGE OF ENGINEERING
Autonomous Institution affiliated to VTU
I Semester B.E. April -2023 Examinations
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING
INTRODUCTION TO C++ PROGRAMMING
(2022 SCHEME)
(Integrated Course – Lab + Theory)

Time: 03 Hours ***Maximum Marks: 100***

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2 is compulsory. Answer any one full question from 3 and 4, 5 and 6, 7 and 8, and 9 and 10, and 11 lab components (compulsory).

PART-A (Objective type for one or two marks)
(True & false and match the following questions are not permitted)

1	1.1	Write any two differences between C++ class and C++ structure	1
	1.2	How function overriding is implemented in C++?	1

	1.3	What is the output of the following program?
		#include<iostream>
		using namespace std;
		class Test
		{
		int x;
		};
		int main()
		{
		Test t;
		cout << t.x;
		return 0;
		}
			1

	1.4	Write any two points on how constructors are different from other member functions of the class?	1
	1.5	What is the significance of Friend Function in C++?	1
	1.6	Define Multiple Inheritance.	1
	1.7	What is an exception in C++ program?	1
	1.8	_____ is one of the powerful features in C++, which provides general-purpose, templatized classes and functions that implement many popular and commonly used algorithms and data structures for real time applications.	1
	1.9	How many arguments are required in the definition of an overloaded unary operator?	1
	1.10	How many instances of an abstract class can be created?	1

PART-B (Maximum subdivisions is limited to 2 in each question)

		UNIT-I	
2	a	List the differences between procedural programming and object oriented programming.	06

	b	#define SIZE 20
		class stack {
		int stck[SIZE];
		int tos;
		public:
		void init();
		void push(int i);
		int pop();
		};
		For the Class definition given above, write the implementation details of the member functions to simulate the working of the stack data structure. Also demonstrate the application of the stack: converting a given integer number to its binary form. (Necessary details can be added to the class)
			08

		UNIT-II	
3	a	Briefly explain the passing and returning of objects in C++ functions with examples.	10
	b	Differentiate between constructors and destructors with examples.	04
		OR	
4	a	Write a C++ program using friend functions for comparing attributes of two different classes to check whether attributes of both classes are equal.	10
	b	Explain the relationship between Structures, Unions and Classes.	04

		UNIT-III	
5	a	Illustrate the types of inheritance with examples for each.	06
	b	Write a C++ program to create an abstract class - SHAPE to represent any shape in general. The class should have two pure virtual functions to read dimensions and to compute the area. Create three derived classes - CIRCLE, RECTANGLE, and SQUARE by inheriting the features of class SHAPE. Implement the functions to read and compute the area. Add constructors, method to display the results as required. (Assume appropriate attributes).	08
		OR	
6	a	Demonstrate function overloading and overriding in C++ with examples.	08
	b	Outline a C++ program to demonstrate Multilevel inheritance.	06

UNIT-IV			
7	a	Outline the statements to throw and catch the below exceptions **i.** A string "Network failure" **ii.** The unlucky number 13	04
	b	Write a C++ program to demonstrate try, throw and catch blocks.	10
		OR	
8	a	Illustrate terminate() and unexpected() in C++ with examples.	06
	b	Write a C++ program to demonstrate multiple catch statements.	08

UNIT-V			
9	a	Write a brief note on the following. I. Template Class "vector" II. Template Class "list"	06
	b	Outline a C++ program to create a vector of integers. Copy the vector contents into a list, sort the contents, then copy selected items into another vector (like elements less than 10 etc).	08
		OR	
10	a	Outline a generic program to find out the maximum of two elements of same type. (Elements can be of any built-in type: int/ float/ double/char). Identify the OO concept required to model the above requirement and briefly discuss the same.	10
	b	Write a brief note on containers in C++.	04

LAB COMPONENT			
11	a	Write a template function to search for a given key element from an array. Illustrate binary search in integer, character as well as double arrays using the same template function.	10
	b	Implement a class STUDENT with attributes like: roll number, name, 3 tests marks. Implement member functions a. to read student data like name and test marks, b. to compute average marks (considering best two out of three test marks) and c. to display the student information. Declare an array of STUDENT objects in the main function, use static data member to generate unique student roll number	10