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RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

IV Semester B. E. Fast Track Examinations Oct-2020

Computer Science and Engineering

OBJECT ORIENTED PROGRAMMING WITH C++

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.

PART-A

1	1.1	Differentiate between procedural programming language and object–oriented programming language.	02
	1.2	How is encapsulation feature implemented in $C++$?	01
	1.3	Mention any one property of static member in $C++$.	01

	1.4	Write the output of the following code:
		$\#include < iostream >$
		$\#include\ < string >$
		$\#include < c\ string >$
		$\#define\ greater\ (A,B)(A > B)?\ A + 1 : B + 2$
		$int\ main()$
		{
		$\quad char\ word[] = "RVCE";$
		$\quad int\ L = strlen(word);$
		$\quad for\ (int\ i = 0;\ i < L - 1;\ i++)$
		$\quad\quad word[i] = greater(word[i], word[i+1]);$
		$\quad cout << word;$
		$\quad return\ 0;$
		}
			02

	1.5	The following code initializes the array at Compile time or at Run time? Give reasons for your answers $int\ numbers[5] = \{10,20,30,40,50\};$	01
	1.6	Which of these a) Constructor b) destructor can be virtual?	01
	1.7	Differentiate between dynamic polymorphism and static polymorphism.	02
	1.8	Mention the name of class which is the base class (super class) for all the stream class.	01
	1.9	Write the type of $C++$ operators (Arithmetic, Logical and Relational operators) from the following: i) ! ii) != iii) && iv) %	02

	1.10	Name the header files required to execute the following code:
		void main()
		{
		char S[] = *"Hello"*;
		for (*int i* = 0; *i* < *strlen*(*S*); *i* + +)
		S[*i*] = *S*[*i*] + 1;
		cout << *S* << *endl*;
		}
			02

	1.11	Write a template class to find the maximum of two numbers.	02
	1.12	Name one important advantage of using exceptions in $C++$.	01
	1.13	Mention any two list *STL* function with its operation.	02

PART-B

2	a	How does an inline function differ from a preprocessor macro? What are the advantages/ disadvantages of using inline functions in $C++$?	08
	b	Write a $C++$ program to find and display the sum of all values, which are ending with 2 (i.e units place is 2) For example if the content of the array is: 22 16 12 19 5 2 Out should be : 36	08
		OR	
3	a	Explain the usage of default arguments in $C++$ member functions. Write a program in $C++$ with a function to calculate the area of a rectangle. The program must illustrate the usage of default values as function arguments.	06
	b	Mention with an example the working of parameterized constructor.	10
4	a	Explain how ambiguities are resolved in multiple inheritance.	10
	b	What is Dynamic memory allocation? How is it different from memory allocated to normal variables? How is memory allocated/ de allocated in $C++$?	06
		OR	
5	a	Explain the three ways in which a class can be inherited using public, private and protected access specifier.	06

	b	Answer the below given questions from (i) to (iv)
		
		class PRODUCT
		{
		int code;
		char Item[20];
		protected;
		float Qty;
		public:
		PRODUCT();
		void GetIn()
		void Show();
		};	

```
class WHOLESALER
{
   int WCode;
   protected:
       char Manager[20];
   public:
       WHOLESALER();
       void Enter();
      void Display();
};
class SHOWROOM: public PRODUCT, private WHOLESALER
{
    char Name[20], City[20];
    public:
       SHOWROOM();
       void Input();
      void View();
};
```

i) Which type of inheritance out of the following is illustrated in the above example?
ii) Write the names of all the data members, which are directly accessible from the member functions of class *SHOWROOM*.
iii) Write the names of all the member functions, which are directly accessible by an object of class *SHOWROOM*.
iv) What will be the order of execution of the constructors, when an object of class *SHOWROOM* is declared? 08

c) Give the declaration of class D that publicly inherits from class B, and privately inherits from class C. 02

6 a) What is operator overloading? Explain with examples the general structure, rules and advantages of operator overloading. 08

b) Mention the general syntax for overloading unary $++$ and $-$ operators and relational $>$ and $<$ operators in $C++$. 08

OR

7 a) Write a program in $C++$ to compare area of two rectangular objects by overloading the relational operator $'>'$. Display the area of the rectangular object whose area is greater than the other rectangular object. 08

b) Write a program in $C++$ to add two complex numbers by overloading the arithmetic $'+'$. Make use of constructors to initialize the objects of Complex class and destructors to de-allocate memory. 08

8 a) When are virtual functions required? Illustrate with an example the need for virtual functions in $C++$. 08

b) Write a $C++$ program to show the usage of pure virtual functions. 08

OR

9 a) Write a $C++$ program with template function to find maximum of two numbers using conditional statement and demonstrate the working of the template for integer, float and character data types. 08

b) What is the purpose of an iterator? Explain the advantages of using iterators with an example. 08

10	a	Discuss the advantages of Exception Handling in $C++$ over traditional approaches.	06
	b	Explain how exceptional handling is done in $C++$? Explain try, catch and throw constructs in $C++$.	10
		OR	
11	a	Differentiate between 'get' and 'getline' function, 'write' and read function with respect to input-output operations.	10
	b	Discuss the hierarchy of stream classes in $C++$.	06