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322455(22)

B. E. (Fourth Semester) Examination Nov.-Dec. 2019

(New Scheme)

(Computer Sc. & Engg. Branch)

OBJECT ORIENTED CONCEPTS & PROGRAMMING using C++

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions. Part (a) of each question is compulsory and carries 2 marks. Attempt any* ***two*** *parts from (b), (c) and (d) which carry 7 marks each. Marks would be deducted for incorrect code examples. Answer in points.*

Unit - I

1. (a) Explain with neat diagram the 4-step compilation process in C++.

(b) Compare Procedure oriented and Object oriented programming.

(c) Explain the difference between function prototype, function definition and function calling. Give examples.

(d) What is a Constant Pointer, Pointer to a Constant and Constant Pointer to a Constant. Give examples.

Unit - II

2. (a) How is data encapsulation, hiding, abstraction and protection related to each other? How can all these be done at a time? Give example.

(b) Write a program to assign unique ID numbers to all the objects when member function setID( ) is called. Display the ID numbers when member function getID( ) is called. Display total number of objects created using static member function show Total( ).

(c) The following program should be able to swap the data member of objects ob1 and ob2. The data members should private. (hint : use friend function/class).

Line No.	C++ Code	Line No.	C++ Code
1	main( )	7.	ob 2.fill(20);
2.	{	8.	swapAB(ob1, ob2)
3.	clrscr( );	9.	ob1.show( );
4.	A obl;	10.	ob2.show( );
5.	B ob2;	11.	getch( );
6.	ob1.fill(10);	12.	}

(d) The following program should be able to swap the data member of objects ob1 and ob2. The data members should private. (hint : use friend function/class).

Line No.	C++ Code	Line No.	C++ Code
1	main( )	7.	ob 2.fill(20);
2.	{	8.	ob1·swapAB(ob2);
3.	clrscr( );	9.	ob1·show( );
4.	A obl;	10.	ob2·show( );
5.	B ob2;	11.	getch( );
6.	ob1.fill(10);	12.	}

Unit - III

3. (a) Explain various types of constructors in C++.

(b) How can we use overloading of cast operation to

convert an object of a class into a basic data type. Give example.

(c) Complete the following program without using global variables and without changing code in the main function. The data members should be private. Justify the reason behind the output.

Program Code :	Output :
void main( )	Created object id: 1
{	Created object id: 2
{	
MyClass ob1, ob2, ob3	Created object id: 3
}	Destructed object id: 3
getch( );	Destructed object id: 4
}	Destructed object id: 2

(d) Explain how using an overload " = " operator, we can perform deep copy of objects. Explain with example.

Unit - IV

4. (a) Explain with proper code examples public inheritance, protected inheritance and private inheritance.

(b) Implement a multilevel inheritance structure using three classes A, B, C. Class A is the grand parent of class C. Class A has a public member function test1( ). Arrange the inheritance in such a manner that the member function test1( ) becomes protected in class B and private in class C. The program should be designed in such a manner that the above arrangement can be proven.

(c) Find the error in the following program. Justify the reason of the error found and suggest appropriate solution to the problem and rewrite the corrected code. The code in the main( ) should not change.

Line No.	Program Code
1	#include<iostream.h>
2.	#include<conio.h>
3.	class C1
4.	{
5.	public: void test( ) {cout<<"\n
6.	C1 :test( )";}
7.	};
8.	class C2:public C1

```
9.      {}.
10.     class C3:public C1
11.     { };
12.     class C4:public C2, public C3
13.     {};
14.     void main( )
15.     {
16.     C4 ob;
17.     ob.test( );
18.     getch( );
19.     }
```

(d) Implement the following inheritance structure using C++ code. There is a class C1 which has a member function f1( ) and class C2 has member function f2( ). Class C3 inherits C1 and C2. Class C4 inherits C3. The functions f1( ) and f2( ) both should get inherited in C3 and only function f2( ) should get inherited in C4.

Unit - V

5. (a) Write down the basic steps for performing Disk file operations in C++.

(b) Write a program to count the number of alphabets, numbers and special symbols present in a text file.

(c) Complete the following program using function template :

```
void main( )
{
clrscr( );
printWithLength(100); //o/p: 100 length: 4
printWithLength('Z'); //o/p: Z length: 1
printWithLength(123.456); //o/p: 123.456 length: 8
printWithLength("WELCOME"); //o/p: WELCOME
                                        length: 4
getch( );
}
```

(d) What is the need of exception handling? Explain with proper program code the implementation of exception handling in C++.