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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: III**
Branch: INFORMATION SCIENCE AND ENGINEERING **Duration: 3 hrs.**
Course Code: 19IS3PCOOP **Max Marks: 100**
Course: Object Oriented Programming Using C++ **Date: 19.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably assumed.

UNIT - I

1 a) Explain the following i) Encapsulation ii) Polymorphism iii) inheritance iv) reference variable v) static variable. **05**

b) Develop a program that has a function definition in such a way that it supports the following function calls: Function1(); **05**
Function1(4,"hello");
Function1(5);

c) **10**

Details of Bank Account			
Account no	**Name**	**Credit**	**Debit**
101	Dayanand	20000	45000
102	Sagar	3000	51000
103	Samarth	5000	47000
104	Geetha	25000	67890

Develop a program to obtain the above given output with 15 more entries that are similar as shown above.

UNIT - II

2 a) Explain inline functions. What are the advantages of inline functions? **05**

```
void func(){ i1 …… i25}
 int mian()
{
 func();
}
```

func() has 25 instructions. Can func() be considered inline, and Abiding the rules of inline ,Justify your answer.

b) Develop a program to multiply private variables of two different classes using a nonmember function. **05**

c)
```
class Train
        {
                int Train_id;
                char Train_Name[];
                  char source_city[];
                  char destination_city[];
                  float ticket price;
        };
```

Write default, parameterized, copy constructors and destructors for the given class. Also demonstrate overloading of constructors.

d) **05**

```
Class time1
{
 Int hr,mi,sec;
….
}
Int main()
{
 time1 t1,t2,t3
….
  t3.add(t1,t2);
 add(t1,t2,&t3);
....
}
```

Complete the given code with appropriate functions to read display and add two time objects that supports the function calls given in main.

UNIT - III

3 a) What are the rules for overloading operators? What are the operators that cannot be over loaded? **05**

b) Write a program to input a complex number and display the same by overloading << and >> operator. **05**

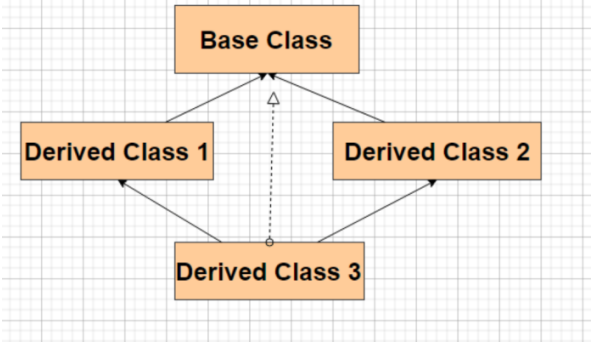
c) **05**

i)Predict the output of the following and explain the concept behind the program	ii)Write a program to compare distance objects by overloading > operator

class find {
public:
void print() { cout <<" In find class"; }
};
 	
class course : public find {
public:
void print() { cout <<" In course class"; }
};
 	
class tech: public course { };
 	
int main(void)
{
tech t;
t.print();
return 0;
}	

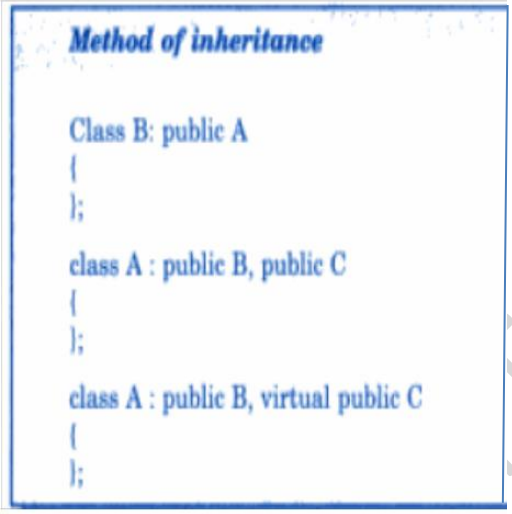
d) Develop a program to overload unary – operator for a object of a class that represents space with three point coorodinates x,y and z, **05**

OR

4 a) 

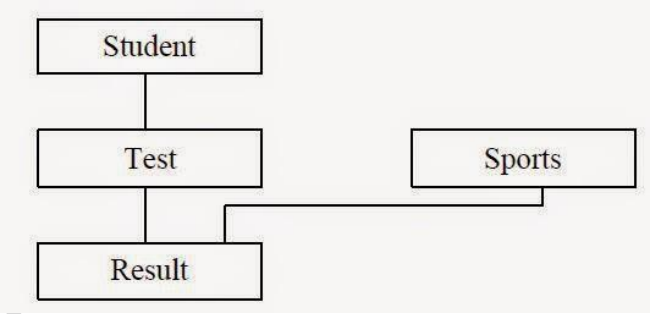
05

Analyze the error which will occur in the above relationship. Provide a solution for the same with a C++ program.

b) 

05

Write the order of execution of constructors and destructors in the above given inheritances.

c) 

10

Identify the type of inheritance given in the diagram and develop a program to implement the same.

UNIT - IV

5 a) Write a pure virtual function, display () for class A which acts as base class for C and S. Print the different messages in each class. Demonstrate it with a main function. **05**

b) Write a program to demonstrate function pointers. **05**

c) Create a class (Student) with the following class members as public members.:stud_name, marks as data members: getStudentInfo() and displayStudentInfo() as member functions. Implement the getStudentInfo() and displayStudentInfo() member functions. Create a main() method. Create an array of stud object with max size and a pointer object of Student class.Assign base address of object array to pointer object and make function calls to getStudentInfo() and displayStudentInfo() using class pointer object **10**

OR

6 a) Develop a program to copy content of one file to another file. **10**

b) Develop a program to get the following output **10**

```
------------------------
Implementing ios::width
   A
10
------------------------
------------------------
Implementing ios::fill
*********a
****1
------------------------


------------------------
Implementing ios::setf
+100 +200
------------------------
------------------------
Implementing ios::unsetf
200.000
------------------------
```

UNIT - V

7 a) Predict the output of the following **05**

i)
```
#include <iostream>
using namespace std;
int main()
{
  int x = -1;
  try {
    cout << "Inside try \n";
    if (x < 0)
    {
      throw x;
      cout << "After throw \n";
    }
  }
  catch (int x ) {
    cout << "Exception Caught \n";
  }
cout << "After catch \n";
  return 0;
}
```

ii)
```
#include<iostream>
using namespace std;

class Base {};
class Derived: public Base {};
int main()
{
  Derived d;
  try {
     throw d;
  }
  catch(Base b) {
      cout<<"Caught Base Exception";
  }
  catch(Derived d) {
      cout<<"Caught Derived Exception";
  }
  return 0;
}
```

b) Develop a program that throws dive by zero exception. **05**

c) Develop function template for finding sum of elements contained in an array demonstrate for two different data types. **05**

d) Develop a class template that demonstrates two generic data types being passed for the class template. **05**

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