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NATIONAL INSTITUTE OF TECHNOLOGY GOA

Farmagudi, Ponda, Goa, 403401

B.Tech-CSE- IV Semester

Mid Semester Examinations, March-2022

Course Name: Object Oriented Programming **Course Code:** CS252
Date: March 07, 2022. **Time:** 9: 30 AM
Duration: 90 Minutes **Max. Marks:** 50

Instructions:

1. *Write legibly. Unnecessary details attracts penalty.*
2. *You must complement your explanation with the short fragments of C++ code where appropriate.*
3. *Your programs should compile on any standard C++ compiler and be executed.*
4. *You should assume that appropriate headers and namespace std are included in each program.*
5. *You should provide justification to all the answers in Question 1. Question paper is of four pages.*

Question 1: You have to provide justification for your answer.

a) What is the output of the program? **(2)**

```
#include <iostream>
using namespace std;
void fun(int=10, int=20, int=30);
void fun(int,int);
int main()
{
   fun(1,2);
   return 0;
}
void fun (int x, int y, int z)
{
   cout<<x<<y<<z<<endl;
}
void fun (int x, int y)
{
   cout<<x<<y<<endl;
}
```

b) Suppose there is a function with the prototype

```
void fun(int=10, int=20, int=30,int=40);
```

If this function is called by passing 2 arguments to it, how can you make sure that these arguments are treated as first and the third, whereas, second and the fourth are taken as defaults. **(2)**

c) What is the output of the program? **(2)**

```
class Date
{
   private:
   int day, month, year;
   Date()
   {
```

d) What is the output of the following program? **(2)**

```
int incr(int i)
{
        static int count = 11;
        count = count + i;
        return (count);
}
```

	day=7;
	month=3;
	year=2022;
	}
	void display()
	{
	cout<<day<<month<<year;
	}
	};
	int main()
	{
	Date date;
	return 0;
	}
			int main()
			{
			int i,j;
			for (i = 0; i <=4; i++)
			j = incr(i);
			cout<<j;
			return 0;
			}

e)	What is the output of this program? **(2)**
	#include <stdio.h>
	int main()
	{
	int a = 11;
	int b = 16;
	
	printf("=%d",(a+3),(b=a+2));
	printf(" %d=",b);
	
	return 0;
	}		

2 Write a C++ program to create a class called STACK using an array of integers (memory should be dynamically allocated for array for the user requested size) and implement the following operations by overloading the operators + and -- :

i. s1=element +s1; where s1 is an object of the class STACK and element is an integer to be pushed on to top of the stack.

ii. s1=s1-- ; where s1 is an object of the class STACK and -- operator pops off the top element.

iii. s1=s1++; where s1 is an object of the class STACK and ++ operator should increment the value of each element in the stack by 1.

You have to handle the STACK Empty and STACK Full conditions. Also display the contents of the stack after each operation, by writing a display routine. **(10)**

3

a) Write a C++ program to sort an array of integers, array of floats and array of doubles. You can use bubble sort for sorting. Write the appropriate main function. **(5)**

b) Suppose you are developing an application and you are frequently (say 1000 times) required to compute the maximum of two elements. Write an efficient C++ program to handle this situation. Justify your approach. **(5)**

c) Write a C++ program to create a class called LIST (linked list) with member functions to insert an element at the front of the list as well as to delete an element from the front of the list. Display the list after every operation. **(5)**

d) Is there any problem with the following program? Explain. Correct the program if you find any problem. **(5)**

```
#include<iostream>
using namespace std;
class myclass
{
   int *p;
   public:
   myclass()
   {
      p= new int;
   }

   ~myclass()
   {
      delete p;
      cout<<"I am destructed";
   }
   void display()
   {
      cout<<*p;
   }
};
```

```
myclass foo(myclass ob)
{
   cout<<"Hello";
   return ob;
}
int main()
{
   myclass x,y;

   y=foo(x);

   cout<<"End";
   return 0;
}
```

4

Write a C++ program to create a class called MATRIX using a two-dimensional array of integers. Implement the following operations by overloading;

i) Operator = = which checks the compatibility of two matrices m1 and m2 to be added and subtracted. Note that m1 and m2 are MATRIX objects.

ii) Perform the addition and subtraction by overloading the operators + and – respectively.

iii) Display the results (sum matrix m3 and difference matrix m4).

Your main function should handle the below.

```
if(m1 = = m2)
{
        m3 = m1 + m2;
        m4 = m1 – m2;
}
else
{
  //      display error
}
```

iv) Your program should handle the cases such as m1=m2+m3-m4; preferably, the memory to the two dimensional array should be allocated dynamically. **(10)**

**********All the Best**********