Student Name:
ID:

Time : 1 hour
Marks: 20 marks – 5% of course
ANSWER ALL QUESTIONS

SFDV 4001 – Test 1

1. What will be the output of the following program?

```
int a = 1; int b = -1;
int *e = &a; int *f = &b;
*e = a + *f;
e = f;
cout << "a = " << *e << endl;
cout << "b = " << *f << endl;
```

a) a = 1 b = -1
b) a = -1 b =-1
c) a = 0 b= -1
d) a = 0 b = 1

2. Which one of the following is NOT true about constructors?
a) A class can have many constructors with different arguments
b) You do not need to write a constructor for a class
c) Constructors do not need to have the same name as the class name
d) b & c

3. Consider the following program which compiles and runs correctly.

```
class Hello {
public:
    //code written in class definition to save space - this is OK
    Hello() { cout << "Hello\n"; };
    ~Hello() { cout << "Bye\n"; };
};

int main(int argc, char *argv[])
{
    Hello h1;
    Hello *h2 = new Hello();
    delete h2;
}
```

What is the output of the above program?
a) Hello is printed two times, Bye is printed one time
b) Hello is printed two times and Bye is never printed
c) Hello is printed two times , Bye is printed two times
d) Hello is printed once , Bye is printed once

4. Which of the following is an associative container?
a) Stack
b) Map
c) Array
d) Vector

5. Where does *new* allocate memory to an object?
a) in the *main()*
b) on the heap
c) on the stack
d) on the linked list

6. Consider two classes - class *Fruit* which is the base class and class *DryFruit* which is a derived class of *Fruit*.
Which one of the following statements would be incorrect?
a) Fruit *f = new DryFruit();
b) DryFruit *df = new Fruit();
c) DryFruit *df = (DryFruit *) new Fruit();
d) DryFruit *df = dynamic_cast<DryFruit *> new Fruit();

7. [1 mark] Write a class Point which has two fields x and y. Write a constructor which takes two parameters to initialize x and y.
[1 mark] Write a method *showXY()* which prints the values of X and Y.
[2 marks]Overload the == operator to compare two Point objects.

8. Write a class Triangle which has three fields to represent the three sides of a triangle.
[1 mark]Write a constructor which takes three parameters to initialize the values for the three sides.
[2 marks] Overload the + operator to add two Triangle objects and return a larger Triangle object.
[2 marks] Write a method *bool isEquilateral()* which returns true if all the sides are equal otherwise returns false.

9. [5 marks] Complete the *sumArray()* and *sumArrayUsingPointer()* functions in the program given below.

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

int sumArray(int a[], int length){
    //complete this function to return the sum of all elements in a[]
    ....
}

int sumArrayUsingPointer(int *a, int length) {
    //complete this function to return the sum of all elements
    //in  the array using pointers
    //....
}

int main(int argc, char *argv[])
{
    int array[] = {1,2,3};

    cout << sumArray(array, 3) << endl; //should print 6
    cout << sumArrayUsingPointer(array, 3) << endl; //should print 6
    return 0;
}
```