NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
Department of Computer Science and Engineering
Midterm Exam (Autumn 2018)

Course: **OOPS**	Semester: **3rd (CSE/IT)**	Time Allotted: **1.5 hours**
Max Marks: **30**	Dated: **28/09/2018**	Credits: **04**

Note: Attempt all questions. Vague answers and/or inaccurate or missing elaboration receive no marks.

Q1. a) What is object oriented programming? Explain data abstraction, encapsulation, inheritance and polymorphism with suitable examples.

b) Give examples of three different ways of using the **const** keyword. For each example, briefly describe what **const** does in that use case and why you would use it in this way.

c) Explain the difference between structure and class with the help of examples.

[4, 3, 3]

Q2. a) Which of the following overloaded functions are NOT allowed in C++? Support your answer with a reason.

i) Function declarations that differ only in the return type

```
int fun(int x, int y);
void fun(int x, int y);
```

ii) Functions that differ only by static keyword in return type

```
int fun(int x, int y);
static int fun(int x, int y);
```

iii) Parameter declarations that differ only in a pointer * versus an array [ ]

```
int fun(int *ptr, int n);
int fun(int ptr[], int n);
```

iv) Two parameter declarations that differ only in their default arguments

```
int fun( int x, int y);
int fun( int x, int y = 10);
```

b) Declare a class named **Triple** with three private data members (floats) x, y, and z. Provide public functions for setting and getting values of all the private data members. Define a constructor that initializes the values to user-specified values or, by default, sets the values all equal to 0.

c) When do we need to use default arguments in a function?

d) What is the most significant advantage that you see in using references instead of pointers?

[4, 3, 1.5, 1.5]

Q3. a) Write a class **Point** with two class parameters representing the two coordinates of the Point. Include public methods to display and set the data values as well as a function that swaps the values so that, after the swap, the first element is cast into the second and the second is cast into the first. Also write a main function that creates a Point object and calls the public methods.

b) Write a class that contains two class data members *numBorn* and *numLiving*. The value of *numBorn* should be equal to the number of objects of the class that have been instanced. The value of *numLiving* should be equal to the total number of objects in existance currently (i.e., the objects that have been constructed but not yet destructed.)

c) Why can't the constant pointer **this** be used inside a static method? **[4, 4, 2]**