National Institute of Technology Silchar
Mid Semester Examination, July-December, 2020
Subject code: CS 201, Subject name: Data Structures

Time: 1 Hour **Total Marks: 20**

Instructions:

- **Write all answers in a clear and legible manner.**
- **All submissions must be scanned and not just a photo of the answers.**
- **Scanned pages must be combined and converted into a single pdf file before submission.**
- **The submission pdf file should be named as *your_scholar_id.pdf*, e.g., for scholar id 1715010, the file name should be: *1715010.pdf***
- **The submission file should be attached to the submission email, and not given as a Google drive link.**
- **The submission email must have the subject as: *MID_SEM_Your_Scholar_Id*, e.g., for scholar id 1715010, the email should have a subject as: *MID_SEM_1715010***
- **Extra five minutes after the exam is provided for the submission of pdf with appropriate file naming and email subject.**

1. What is the time complexity of the following code segment? **4**

```
void foo( int m)
{
    for(int j=1;j<=m;j++)
    {
        k*=j;
     }
}
for(int i=0;i<=foo(n);i++);
```

2 a. What are some of the advantages of using Linked Lists over Arrays? **2**

b. What are the data types in C? Give examples. **2**

3. Write a function for the deletion of one node before and after a given node in a Link List. **6**
[**Note**: deletion of one node before and after results in a deletion of two nodes at a time. Also provide the necessary conditions.]

4. Given 1 Million integer data can be fitted in RAM and 1 Trillions integer data in HDD. Write a program/algorithm to validate whether the given data of HDD are sorted in ascending order or not? **6**