# UTTARAKHAND OPEN UNIVERSITY, HALDWANI (NAINITAL)
## उत्तराखंड मुक्त विश्वविद्यालय, हल्द्वानी (नैनीताल)

# MCA 1ST YEAR 2ND SEMESTER ASSIGNMENT

*Last Date of Submission: 31May 2016*

**Course Title:** Data Structure Through C Language    **Course Code:** MCA-06

**Year:** 2015-16    **Maximum Marks:** 40 Marks

**Section 'A' contains 08 short answer type questions of 5 marks each. Learners are required to answers 4 questions only. Answers of short answer-type questions must be restricted to 250 words approximately.**

1. State the need of data structure.

2. Define the terms node, address, null pointer and next pointer for linked list.

3. Discuss the following terms
   i.   Connected graph
   ii.  Disconnected graph

4. Define data type and abstract data type. Comment upon the significance of abstract data type.

5. What are the applications of stack?

6. Suppose an array[15] stores numeric values only, write algorithms to
   i.   Calculate the average of the values in arr.
   ii.  Print the even numbers stored in arr.

7. Compare linear linked list and double linked list with diagrams.

8. Write short note on dynamic memory allocation.

**Section 'B' contains 04 long answer-type questions of 10 marks each. Learners are required to answers 02 questions only.**

1. (a) Write a Complete program in C to create a single linked list. Write functions to do the following operation.

      i. Insert a new node at the end

      ii. Delete the first node

  (b) Explain the bubble sort method.

2. Define the following terms using suitable examples.

      i.   Degree of Tree

      ii.  Height of Tree

      iii.  Siblings

      iv.  A full binary tree

      v.   A complete binary tree

3. What is a circular queue? Write down routines for inserting and deleting elements from a circular queue implemented using arrays.

4. (a) What is binary search tree? List its advantages.

  (b) What is data structure? Explain the types of data structure.