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

MCA 1st YEAR 2nd SEMESTER ASSIGNMENT

Last Date of Submission: 15 May, 2012

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

Year: 2011-12 **Maximum Marks: 40 Marks**

Section 'A'

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. (a) Write an algorithm to calculate multiplication of two square matrices and also calculate the complexity of the algorithm.
   (b) Discuss performance of Quick short in each case.
2. Prove the following:
   (a) $3n^5-7n+4= 0(n^5)$
   (b) $2n^4-7n^2+5n= 0(n^4)$
3. (a) Give any two real life examples of stack and write algorithm for all the stack operations associated to those examples.
   (b)Implement stack (any one of the above question) by both the methods.
4. Discuss the different ways of Queue implementation and discuss which implementation is efficient?
5. Discuss the importance of searching in computer science also discuss linear search. Which case is more efficient for linear search?
6. Discuss following Binary Search Tree operations with suitable program in C:
   a. Insertion in BST
   b. Searching in BST
   c. Deletion in BST
7. Discuss in detail all the appropriate data structure used as store, retrieval and manipulation of data in internal and external memory.

8. List out the areas with the explanation and example in which data structures are applied extensively.

Section 'B'

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

1. (a) Discuss best case, worst case and average case complexities of Sequential search and Binary search and which one is best in each case.

   (b) Compare and contrast different sorting techniques and which one is the best for a particular sorting of elements in each case.
2. (a) Write a C program to implement stack and queue using circular linked list.

   (b)Distinguish between Static and dynamic implementation of stack.
3. (a) Short the following array using various sorting algorithms and also compare them:

   A[] ={354,31,81,22,48,13,69,93,14,58,79,72,128};

   (b)A mathematical expression (15+5*(3+10))/(8-(4+2)) is given, find out the postfix notation and evaluate the postfix notation.
4. Write a program in C to print all the paths from each node to the leaves.