**Roll No. .....**

**MCA-11/PGDCA-11**

**(Master of Computer Application/ P.G. Diploma in Computer Application)**

**Second Semester Examination 2012**

**Data Structure through 'C' Language**

**Time: 3 Hours** **Max. Marks 60**

**Note: The Question paper has been divided in three sections- A, B and C.**

**Answers the Questions as per instructions given in each sections.**

**Section 'A'**

**(Long Answer's Question)**

**Answer any two questions. Each question carries 15 Marks. (2* 15 =30)**

1. (a) Write a C function for simple merge sort. Also explain the mechanism of simple merge sort with suitable sample data.
   (b) Explain the bubble sort method.

2. (a) What is a threaded binary tree? Explain the process of threading with an example.
   (b) Define the following terms using suitable examples.
   (i) Degree of Tree.
   (ii) Height of Tree
   (iii) Adjacency matrix

3. (a) Write an algorithm for implementation of Breadth First Search(BFS)
   (b) Write a binary search tree? List its advantages.

4. (a) What do you mean by traversal of a tree? Explain the difference between pre order and post order with the help of illustrations.
   (b) What is heap sort? Define its types and properties using suitable examples.

## Section 'B'

**Note: Answer any four questions. Each question carries 5 Marks. 4*5=20**

1. Write at least two differences between a structure and a union in 'C' language. Give a example of each.
2. What is Circular linked List, explain with example.
3. State the need of Data Structures.
4. Define the terms node, address, null pointer and next pointer for linked list.
5. What are Linear and Non linear data structures? Give two examples of each.
6. What is recursion? Illustrate with an example, what are the disadvantages of recursion?
7. Convert infix to postfix and prefix ((a-(b+c))*d* (e+f)
8. What are linked lists? How do they compare with arrays? Give their relative merits of both when certain operations are carried out.

## Section 'C'

**Note: Answer all questions. Each question carries 01 mark. 10*1=10**

1. The postfix form of the expression (A + B) ∗ (C ∗ D − E ) ∗ F / G is
   (A) AB + CD ∗ E − FG /∗ ∗
   (B) AB + CD ∗ E − F ∗ ∗G /
   (C) AB + CD ∗ E − ∗F ∗ G /
   (D) AB + CDE ∗ − ∗ F ∗ G /

2. In worst case Quick Sort has order
   (A) O (n log n)
   (B) O (log n)

(C) O (n2/2)
(D) O (n2/4)

3. The data structure required for Breadth First Traversal on a graph is
(A) queue
(B) stack
(C) array
(D) tree

4. main ( ) is an example of
(A) library function
(B) user defined function
(C) header
(D) statement

5. Literal means
(A) a string
(B) a string constant
(C) a character
(D) an alphabet

6. The output of the following is
x = ‘a’;
printf(“%d”, x);
(A) ‘a’
(B) a
(C) 97
(D) None of the above

7. For implementing recursive function the data structure used is:
(A) Queue
(B) Stack
(C) Linked List
(D) Tree

8. The constructed data type of C is known as

(A) Pointers
(B) String
(C) Structure
(D) Array

9. The postfix form of the following infix notation is : (A + B)* (C*D - E)* F

(A) AB + CD*E - *F*
(B) AB+ CDE + - * F*
(C) AB+ CD - EF + - **
(D) ABCDEF* - + * +

10. In order to get the information stored in a BST in the descending order, one should traverse it in which of the following order?

(A) left, root, right
(B) root, left, right
(C) right, root, left
(D) right, left, root