Roll No. ..... ;.....

MCA/MX 5251

Data Structures Using C

Paper: MCA-201

Time: Three Hours] [Maximum Marks: 80

Note:- Attempt Q. No.I. Attempt **ONE** question from each Units I, II, III and IV.

1. (i) Write syntax of functions for insertion of a string, deletion of a string from text and for getting a substring from text respectively. .

(ii) Write an example of symmetric matrix and explain memory representation of an n x n symmetric matrix.

(iii) Write memory representation Of a linked list and write an algorithm to insert an element in the starting of the linked list.

(iv) Write algorithm to insert an element into the queue.

(v) Using Huffman's algorithm code the following data:

Data:	A	B	C	D	E	F
Weight:	11	2	3	5	7	8

(vi) Define AVL search tree.

(vii) Write an example of multigraph and its sequential representation in memory.

(viii) Write algorithm for depth first search to find a path from the node A to the node X in a graph G. 8x3

UNIT-I

2. (a) Write algorithm for binary search and describe its complexity and limitations. 7

(b) Write algorithm and the corresponding C syntax to find multiplication of two matrices. 7

3. (a) Write algorithm to count the number of times the word "the" appears in a short story S. 8

(b) Consider the pattern P = a3b3. Construct the pattern matching table used in second pattern matching algorithm. 6

UNIT-II

4. (a) Write algorithm to delete an ITEM from a linked list and explain the algorithm with suitable example. 7

(b) Write a program in C to create and display a linked list. 7

5. (a) Write quick sort algorithm and explain it for the following numbers :

45, 35,.25,65,55, 11, 77. 9

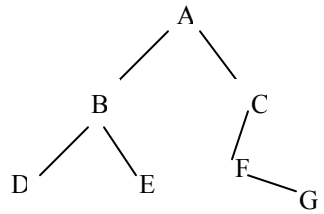
(b) Explain memory representation of priority queue. 5

UNIT-III

6. (a) Write algorithm to insert an element into a binary search tree. Explain it with suitable example. 7

(b) Write algorithm to insert an element to Heap and explain it with suitable example. 7

7. (a) Write algorithm for in-order traversal of a binary tree and apply the algorithm to the following tree:



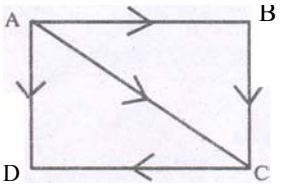
8

(b) Construct AVL search tree for the following numbers:

25,35,20,33,45,50,55. 6

UNIT-IV

8. (a) Write algorithm to delete an edge from a Graph G. Explain for deleting the edge from -A to B in the following digraph:



8

(b) Write algorithm to find shortest path between every two nodes of a weighted digraph D. 6

9. Describe hashing and collision resolution. 14