Question Paper

MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES
FIRST SEMESTER MASTER OF ENGINEERING- ME (VLSI DESIGN)
DEGREE EXAMINATION- NOVEMBER 2017
DATE : Wednesday, November 15, 2017
TIME : 10:00AM - 1:00PM

Data Structures [EDA 609]

Marks: 100 **Duration: 180 mins.**

A

Answer all the questions.

1) Write the data structures required to implement single linked list. Write functions to delete element at any given position. In best case program should work in O(1) and worst case O(N). (10)

(2+4+4)

2) Define stack data structure. Write functions to push and pop elements from linked list based Stack (10)
(2+4+4)

3) What is Queue? Write the data structures required to implement array based queue. Write functions to add and delete elements from queue and check whether Queue if Full. (10)

(2+2+3+3)

4) What are the properties of Binary Search Tree? Provide the data structure required to implement binary search tree. Write a function for delete an element from binary search tree. (10)

(2+2+6)

5) Implement Quick Sort. Derive its time complexity. Give an example. (7+3) (10)

6) What is hashing? Write data structures required to implement separate chain hashing (open hashing) technique. Provide functions to insert element in a hash table with unique values. (10)

(2+2+3+3)

7) Define minimum spanning tree. Describe Prim's and (10)

Kruskal's algorithm for finding the minimum spanning tree.
(2+4+4)

8) With required data structure implement Adjacency list. With an example traverse the graph using BFS and DFS. (10)
(6 +4)

9) Write Inorder, Preorder and Post Order traversal algorithm for a binary tree. Illustrate with an example. (10)
(6+4)

10) Consider two linked list A and B in sorted order. Write a program to merge A and B in C. Resultant C linked list should be in sorted order. Merging should take place in O(n) times. (10)

-----End-----