Question Paper

Exam Date & Time: 19-Apr-2018 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SCHOOL OF INFORMATION SCIENCES (SOIS)
FIRST SEMESTER Master of Engineering - ME (VLSI DESIGN)
DEGREE EXAMINATION - APRIL 2018
Thursday, 19 April 2018
Time : 10:00 am to 1:00 pm
Data Structures [EDA 609]

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

Answer all the questions.

1) Write the data structures required to implement single linked list. Write functions to insert an element in O(1) time and Find Max and Min element in list in O(1) time. (4+4+2) (10)

2) Write the data structures required to implement array based stack. Write functions to check whether stack is full, stack is empty and delete element from stack. (3+2+2+3) (10)

3) Give the data structure required for array based queue. Write functions to create a queue, add and delete element from circular queue. (2+2+3+3) (10)

4) With required data structure write function to delete an element from Binary Search tree. (3+7) (10)

5) Implement Quicksort. Give an example. Discuss its time complexity. (5+3+2) (10)

6) Provide different techniques for representing graph. Describe Prim's algorithm with example. (4+4+2) (10)

7) What is hashing? With required data structure, write function to insert words in alphabetical order in Hash table using separate chain hashing (open hashing). (2+3+5) (10)

8) How do you represent Graph in Data structure? Write a program for BFS traversal technique for graph. (3+7) (10)

9) For the given list 53 24 96 15 38 6 125 90 47 62 83 sort in the descending order using merge sort. Show all steps during sorting (No code is required). Discuss the time complexity of Merge Sort. (7+3) (10)

10) (10)

Given two linked list A and B. Write a function to find C = A Union B with required data structure.

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