Question Paper

Exam Date & Time: 20-Nov-2018 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SCHOOL OF INFORMATION SCIENCES

FIRST SEMESTER MASTER OF ENGINEERING - ME (VLSI DESIGN)

Data Structures [EDA 609]

Marks: 100

Duration: 180 mins.

DEGREE EXAMINATION NOVEMBER 2018

Answer all the questions.

- ¹⁾ Write the data structures required to implement single (10)linked list. Write functions to add and delete an element with the time complexity of O(1). (4+3+3)
- ²⁾ What is a stack? Write the data structures required to ⁽¹⁰⁾ implement array based stack. Write functions to create a new stack, push and pop operation. (2+2+2+2+2)
- ³⁾ Define queue data structure. Write functions to add and ⁽¹⁰⁾ delete elements from linked list based queue. (2+4+4)
- ⁴⁾ For the given list 50, 70, 35, 45, 36, 40, 75, 80, 28, 65, 20 ⁽¹⁰⁾ build BST and provide the in-order, pre-order and post-order traversals. (No code required) (4+6)
- ⁵⁾ Implement Selection sort and Bubble sort. Discuss its time $^{(10)}$ complexity. (4+4+1+1)
- What is hashing? What is collision in hashing? How do you (10) overcome collision in hashing? Show with example.
 (2+2+4+2)
- ⁷⁾ Implement BFS with required data structure. Illustrate with $^{(10)}$ an example. (7+3)
- ⁸⁾ What is minimum spanning tree? Write Prim's algorithm to ⁽¹⁰⁾ find minimum spanning tree. Illustrate with an example (2+5+3)
- ⁹⁾ Write a program to find C = A Intersection B using linked ⁽¹⁰⁾ list to store the data. (10)
- ¹⁰⁾ Consider Graph G with 6 vertex. Traverse the graph with ⁽¹⁰⁾

BFS and DFS. Find minimum spanning tree for the Graph G using Kruskal's algorithm. (No code required) (3+3+6)

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