

Registration No: 

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Total Number of Pages : 01

M.TECH

AR-18

M.TECH 1<sup>ST</sup> SEMESTER EXAMINATIONS(BACK), NOV/DEC 2019

CSE, MCSPC1020

ADVANCED DATA STRUCTURES

Time: 3 Hours

Max Marks : 70

The figures in the right hand margin indicate marks.

**PART-A****(10 X 2=20)****1. Answer the following questions.**

- (a) What is a stack? Explain their applications.
- (b) Describe the representation of a linked list in memory.
- (c) Compute the maximum height of an AVL tree with p nodes?
- (d) Mention different representation of a graph.
- (e) What is a spanning tree?
- (f) What is Fibonacci searching?
- (g) What are the difference between linear search and binary search?
- (h) Explain, how open hashing differ from closed hashing techniques?
- (i) What do you mean by collision in hashing?
- (j) What are the advantages of binary search over linear search?

**PART-B****(5 X 10=50 MARKS)****Answer any five questions from the following.**

2.

- (a) Define Max Heap. Write an algorithm to insert a node into Max heap.
- (b) Describe the deletion operation in a binomial queue.

3.

- (a) Describe the deletion process in a 2-3 tree.
- (b) Describe the insertion process in a B-Tree.

4.

- (a) A file of 6000 records is to be sorted. It is stored on a tape and the block length is 500. The main memory can sort up to a 1000 records at a time. We have in addition 4 search tapes T1 -T4.Explain the sorting method on the tapes.
- (b) Following elements are inserted into an empty hash table with hash function  $f(x) = x \% 13$  and linear probing 112, 44, 52, 45, 37, 278, 89, 28, 61,249 a) Draw the hash table for each insertion. b) What is the load factor after last insertion? c) What is the maximum number of buckets examined in an unsuccessful search.

5.

- (a) Explain how to implement this using Binary Heap? Explain the insertion and deletion operation performed on binary heap, with an example.
- (b) Write short note on linear search with algorithm.

6.

- (a) Explain Counting sorting with an example?
- (b) What is external sorting? Explain different external sorting methods.

7.

- (a) Describe the insertion Process in a Red-Black tree
- (b) Design a recursive algorithm to search an element in a BST.

8. Write Short notes on

- (a) Splay Tree
- (b) Dictionary Abstract Data Type.



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