GIET MAIN CAMPUS AUTONOMOUS,
GUNUPUR - 765022

Registration No: | | | | | | | | | | | **M.TECH**

Total Number of Pages : 2

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018

ADVANCED DATA STRUCTURES

Branch: CS, Subject Code:MCSPC1020

(Regulations 2018)

Time: 3 Hours **Max Marks : 70** **Question Code: RD18002038**

PART-A (10 X 2=20 Marks)

1. Answer the following questions.

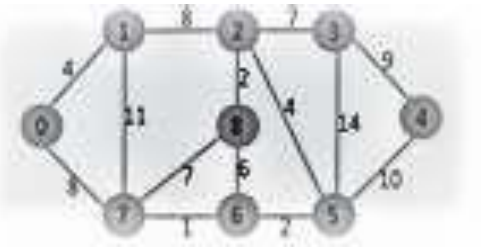
a) Analyze the growth order of n, logn, 1, n logn, 2n, n3, n 2 in increasing sequence.
b) What is a 2-3 tree?
c) What is topological sorting?
d) Mention different representation of a graph.
e) What is a spanning tree?
f) What is Fibonacci searching?
g) What is the difference between linear search and binary search.
h) What is a skip list?
i) What do you mean by collision in hashing?
j) What is external sorting?

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

2. a) Analyze the $\Omega-$ notation for the function given as : $f(n) = 5n^3 + n^2 + 3n + 2$ [5]
b) Construct the AVL tree for the following [5]
34, 67, 23, 15, 45, 37, 28, 9, 13.

3. a) Describe the insertion process in a B-Tree. [5]
b) Describe the Dijkstra's path algorithm in the following graph. [5]



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. [5]
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 i) Draw the hash table for each insertion. ii) What is the load factor after last insertion? iii) What is the maximum number of buckets examined in an unsuccessful search. [5]

5.a)The Keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table? [5]
b)What is a dictionary? Describe its features. [5]

6. a) Design a recursive procedure to search an element in a BST. [5]
   b) Describe the time complexity of the following program: [5]

```
int i ,n;
for (i=0;i¡n:i++)

    print(i);
```

7. a) Describe the insertion Process in a Red-Black tree [5]
   b) Explain Bucket sort with an example? [5]

8. Write Short notes on
   a) Rehashing methods [5]
   b) Tries [5]

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