III B. Tech I Semester Supplementary Examinations, June/July-2022
ADVANCED DATA STRUCTURES
(**Computer Science and Engineering**)

Time: 3 hours   Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1. a) Suppose we use RANDOMIZED-SELECT to select the minimum [8M] element of the array A = {3, 2, 9, 0, 7, 5, 4, 8, 6, 1}. Describe a sequence of partitions that results in a worst-case performance of RANDOMIZED-SELECT.
   b) Discuss directory less dynamic hashing. [7M]

(OR)

2. Use the data {17, 9, 34, 56, 11, 71, 86, 55, 22, 10, 4, 39, 49, 52, [15M] 82, 13, 40, 31, 35, 28, 44} to construct hash table with 9 buckets using the hash function $h(x) = x \bmod 9$, do the following and give appropriate diagrams:
   a) Create the hash table implemented using linear open addressing when each bucket can hold three data elements.
   b) Illustrate the concept of chained hash table.

UNIT-II

3. a) Into an empty Binomial heap, insert elements with priorities 22, [8M] 11, 7, 19, 8, 13, 15, 7 and 25 (in this order). Show the final binomial heap.
   b) Using an example explain the deletion operation from Fibonacci [7M] heap.

(OR)

4. a) Explain about Cascading Cut in Fibonacci heap. [8M]
   b) For the given input [35 33 42 10 14 19 27 44 26 31], construct [7M] Max heap and Min heap.

UNIT-III

5. List the properties of Red-Black tree. Create a Red-Black tree by [15M] inserting following sequence of numbers: 8, 18, 5, 15, 17, 25, 40, 80.

(OR)

6. a) Explain the insertion operation in red black tree with an [8M] example.
   b) Explain how a red black tree can be represented. [7M]

UNIT-IV

7. a) Enumerate the steps involved in the B-Tree insertion operation. [8M]
   b) List the properties of M-way search trees. [7M]

(OR)

8. a) Explain deletion operation from B+ Tree. [8M]
   b) Explain B-Tree representation. [7M]

UNIT-V

9. a) What are the advantages and disadvantages of tries? [8M]
   b) Construct a compressed binary trie for 8, 2, 1, 0, 9, 11. [7M]

(OR)

10. a) Construct a suffix tree T for a string s = abakan. [8M]
    b) Explain searching operation in a trie with an example. [7M]

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