## B.E. Computer Technology Fifth Semester CT501 - Advanced Data Structure

P. P Tim	ages : e : Thr	2 ree Hours $\star 1306 \star$	<b>GUG/W/18/1662</b> Max. Marks : 80
	Note	<ol> <li>All questions carry equal marks.</li> <li>Due credit will be given to neatness and adequate dimensions.</li> <li>Illustrate your answers wherever necessary with the help of neat ske</li> </ol>	etches.
1.	a)	What is heap? Explain following methods to construct heap? Using suitable	examples. 8
		i) Bottom- up approach. ii) Top- down approach.	
	b)	What is external sorting? Explain multi- way merge and polyphase merge w example.	ith suitable 8
		OR	
2.	a)	Define sparse Matrix. Write a C++ program to implement ADT of sparse M	atrix. 8
	b)	What is priority queue? Explain all the operations in priority queue.	8
3.	a)	Write a C++ program that for the searching in a hash table.	8
	b)	Give the differences between hashing and skip list.	8
		OR	
4.	a)	Write a C++ program to implement dictionary using linear probing techniqu	e. <b>8</b>
	b)	Perform the insertion operation using double hashing for the following list. 11 52 61 44 35 72 87 27 60 48	8
5.	a)	Write a C++ program to implement ADT of binary search tree.	8
	b)	Explain how balancing of AVL trees can be done by applying various rotation	ons. 8
		OR	
6.	a)	Insert these keys into an AVL tree.	8
		7       14       2       5       10       33       56       30       15       25       66       70       4         Illustrate the problematic insertions.	
	b)	Differentiate between AVL and Binary search tree.	8
7.	a)	Define Red – Black Tree. Construct Red -Black Tree for the following keys	10
		2 1 4 5 9 3 6 7	

## Explain 2-3 tree with example. b)

## OR

8.	a) Write an algorithm to construct Huffman Tree. Explain with example.		8
	b)	Write an algorithm to insert a node in 2-3 Tree. Also construct a 2-3 tree for the following keys.	8
		1 2 3 4 5 6	
9.	a)	Explain following operations performed in Fibonacci heap;	8
		i) Link ii) Cut iii) Remove	
	b)	Write a note on 2-3-4 tree with example.	8
		OR	
10.	a)	Insert	8
		10 30 60 20 50 40 70 80 15 90 100 into an initially empty 2-3-4 tree.	
	b)	Explain different operations performed on mergeable heap.	8
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