B.E. Information Technology (C.B.C.S. Pattern) Sem-III **3BEIT03 - Data Structures**

P. Pages : 2 Time : Three Hours			s GUG/S/19/1 * 3 4 0 8 * Max. Mar	GUG/S/19/11508 Max. Marks : 80	
1.	Note a)	es : 1. 2. 3. 4. 5. Define	Same Answer book must be used for all questions. All questions carry marks as indicated. Due credit will be given to neatness and adequate dimensions. Assume suitable data wherever necessary. Illustrate your answers wherever necessary with the help of neat sketches. Data structures. Describe primitive and Non-primitive types of data structures.		
	b)	Write a functio	C program to create the following array. {20, 30, 10, 8, 6, 4, 9, 12} Also write a n to search '6' in the array using linear search.	8	
			OR		
2.	a)	Define {20, 90	searching and sorting sort the following list of elements using insertion sort 0, 10, 2, 14, 16, 18, 22, 37, 49}	8	
	b)	Write a giving	In algorithm for Merge sort. Describe divide and conquer strategy in Merge sort suitable example.	8	
3.	a)	Write a	C program to create and display the following doubly linked list.	8	
	b)	Descrit	be Garbage collection and memory allocation in Dynamic programming.	8	
			OR		
4.	a)	Write a process	c function to count number of nodes in a circular linked list. Also explain the s using example.	8	
	b)	Write a	short note on header linked list.	8	
5.	a)	Draw e	expression trees for the following arithmetic expressions:	8	
		i) (a	i + (b*c) + (d-e)) + y ii) $(A*(B/C)) + (D-((E% f)+G))$		
	b)	Explain	n Tower of Hanoi problem giving relevant example.	8	
			OR		
6.	a)	Descrit	be stacks. Give push (), Pop () and traverse () operations in C functions.	10	
	b)	Write a	applications of stocks and Queues.	6	

7.	a)	Define Tree. Explain different terminologies in a Tree.	8
	b)	Define Binary Tree. Write a program to create a binary tree for following nodes : {20, 10, 15}	8
		OR	
8.	a)	Describe traversals in a Binary Tree. Write Recursive C functions for the traversals.	8
	b)	Define AVL tree. Crete an AVL tree for the following nodes {10, 9, 7, 12, 14, 2, 8, 6}	8
9.	a)	Define Graph. Explain different representations of graph with suitable example.	10
	b)	Give the applications of graph.	6

OR

- 10. a) Define spanning tree. Explain why it is called as minimum cost tree. (Give example) 8
 - b) Write Dijkstra's Algorithm. Find the shortest path for the following graph using Dijkstra's **8** Algorithm.


