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Time: 3 Hrs

PES University, Bengaluru (Established under Karnataka Act No. 16 of 2013)

UE19CS202

DECEMBER 2020: END SEMESTER ASSESSMENT (ESA) B TECH III SEMESTER UE19CS202 - Data Structures and its Applications

Answer All Questions

1111	ile. 3 mis	Answer All Questions	Max Marks: 100)
1 a	int to	n two singly lists in the ascending order, write a function to return to the same keys across both the lists. o_check(NODE *first, NODE *second) // returns the number of rame key.		6
b	111311	n an ascending ordered sorted doubly linked list, write a function two nodes, make a new node with the data being the sum of the s removed. Insert the newly created node back into the sorted do	data of the torr	8
c)	the sn	ular singly linked list has keys in order starting from a particular per to a node in the list, write a function to return pointer to a node nallest key. *min(NODE * point) // point points to a node in the list, //returns pointer to the node having the smalle	le that contains	6
² a)	contain stack of void pu	ment stack of integers in C by using an array int S{STACKSIZE]. Who stain the index of the top element of the stack. S[1] through so the elements of the stack. Write the functions for push, pop. overflow and underflow. Sush(int *S, int key) // implements push O(int *S) // implements pop	CICTA CUCIZE 43	6
b)	List two	o applications of Stack and Queue.		4
c)	Given a the ma maximu dequeu	a Circular Queue of size MAX_SIZE having n integers, write a func ximum element in the queue. The queue should remain intact aff um element. You should use only standard functions of que ie). You need to also write the functions enqueue and dequeue. It the index of the first and last element of the queue.	tion that finds ter finding the	6
	int Qm	ax(int $*q$) // should return the largest element in the queue.		

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			4
	d)	Given a Singly linked List with head pointing to the first node , What does the following code do	4
		int what (struct node *head)	
		{	
		If (head==NULL)	
		return 0;	
		else if (head->data % 2)	į.
		return(head->data + what(head->next)	
		else	
		return(what(head->next));	
		}	
		,	
3	a)	Given a threaded binary tree where the NULL left and right pointers of a node are	6
	aj	made to point to the inorder predecessor and successor respectively, write a iterative	
		function to traverse the tree in inorder.	
		L. C. L. Linguistan (Not a hinary search	8
	b)	Write an iterative function to search for a key in a binary tree (Not a binary search	"
		tree). Use Stack or a Queue, do not write functions of stack or queue.	
-	,	In a Min heap, the data value of the parent is lesser than its children. Create a Min	6
	c)	Heap using top down approach for the following numbers in sequence:	
		9, 3, 7, 4, 5, 6, 1, 2	
		Recreate the min heap after removing the smallest element.	
		Create an AVL Tree for the following keys: EAT APPLE, DOG, BAT, COT and CAT.	4
4	a)	Create an AVL Tree for the following keys. EAT ALL EL, 500, 511, 711	
	b)	A complete graph is a simple undirected graph in which every pair of distinct vertices	4
	D)	is connected by a unique edge. Given an undirected graph represented as adjacency	
		matrix, write a function to check if it is complete graph.	
		s use to be strongly connected or weakly	6
	c)	What does it mean for a directed graph to be strongly connected or weakly connected? Write a function using DFS to check if a directed graph represented as	
		adjacency list is strongly connected. You need to also write the DFS function.	
		aujacency list is strongly connected. Tou need to also miles	
	1	Create a B Tree of order 3 by inserting the following elements in the sequence:	6
	d)	Create a B Tree of order 3 by inserting the following elements in the sequence:	0

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5 .) Write a function to 1.6	
7 8	Write a function to search for a key in a Trie. Assume the following structure of a Trie node. The function should return 1 if key is found else return 0 struct trienode { struct trienode *child[255]; int endofword; }	6
	int search(struct trienode * root, char *key) // returns 1 if key found else return 0	
b	List any four applications of Trie.	4
c	Define Hashing? How collision resolution is handled using separate chaining and Linear Probing.	4
d	Show the contents of the hash table that results when you insert items with keys P R O B I N G in that order into an empty table N=5. Use separate chaining to resolve collision. Use hash function $h(K) = K^*(K+3) \mod 5$. For example $h(C) = 3^*(3+3) \mod 5 = 3$. Where C is the third letter in the alphabet $h(Z) = 26^*(26+3) \mod 5 = 4$.	6