16CS33 / 12CS33

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RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

III Semester B. E. Fast Track Examinations July 2019

Computer Science and Engineering

DATA STRUCTURES USING C

Time: 03 Hours ***Maximum Marks: 100***

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B.In Part B question number 2, 7 and 8 are compulsory. Answer any one full question from 3 and 4 & one full question from 5 and 6

PART-A

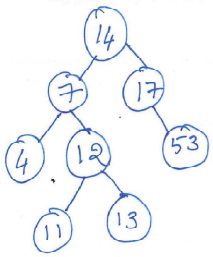
1	1.1	The Postfix form of the expression $(A+B)*(C*D-E)*F/G$ is _____.	02

	1.2	What is the output of the following code?
		$\#include < stdio.h >$
		$int\ f(int\ n);$
		$main()$
		{
		$int\ n = 10;$
		$printf("\%d", f(n));$
		}
		$int\ f(int\ n)$
		{
		$if(n > 0)$
		$return(n + f(n-2));$
		}
			02

	1.3	Given inorder and postorder, Draw the tree inorder= 20,30,35,40,45,50,55,60,70 postorder= 20,35,30,45,40,55,70,60,50	02
	1.4	In the delete operation on a heap_____ node is always deleted	01

	1.5	What does the following function do for a given linked list with first node as head
		$void\ fun1(struct\ node\ *head)$
		{
		$if(head == NULL)$
		$return;$
		$fun1(head->next);$
		$printf("\%d", head->data);$
		}
			02

	1.6	Insert 10,20,5,15 into splay tree	02
	1.7	Give an Example for linear and non-linear data structure	02
	1.8	Write the condition to check whether the Circular Queue is full	02
	1.9	Differentiate between malloc and calloc functions	02

	1.10	Identify the ideal data structure for the following: i) to implement a dictionary ii) to implement token system in a bank	02
	1.11	Write getnode() function for a single linked list	01
		PART-B	
2	a	Write a C program to implement Towers of Hasoi using recursion	06
	b	Illustrate an algorithm to convert a decimal number to binary number using stack. Trace algorithm to convert 10 into a binary.Show stack contents	10
3	a	Differentiate between the following i) Static and dynamic memory allocation with example ii) Enqueue and dequeue operation on a linear queue with functions iii) Linear Queue and Circular Queue.	10
	b	Write a C enqueue function to enqueue a message into a circular queue	06
		OR	
4	a	Explain various memory allocation functions with syntax	06
	b	Write a C Program to implement Queue using stack	10
5	a	Write a C function to search for a element in single linked list	06
	b	Write a C program to check whether the given double linked list with header node is a palindrome	10
		OR	
6	a	Write a C function to print the middle element in a single linked list	06
	b	Write a C program to implement Circular single linked list	10
7	a	Write a C function to implement insertion into a Binary Search tree	06
	b	i) Insert 2,1,4,5,9,3,6,7,16,0 to AVL tree ii) In the given tree delete 14  Fig(7b)	10
8	a	i) Given the input {3481,2313,7163,9149,4944,9679,1089} and hash function $h(x) = x \ mod \ 10$. Show the result of "Open addressing with linear probing" ii) Explain Quadratic probing	06
	b	What is the difference between a binary search tree and a heap? For a given sequence of numbers construct main heap and a BST 34,23,67,45,12,54,87,43,98,75,84,93,31	10