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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Third Semester, B.E. - Computer Science and Engineering

Make-up Examination; May - 2022

Data Structures

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: Design and Implement standard data structures like stack using recursion.

CO2: Design and implement operations on linked list.

CO3: Develop programs to implement different queues.

CO4: Design and implement different tree traversal techniques using iteration and recursion.

CO5: Implement sorting and searching techniques.

***Note**: I) **PART - A** is compulsory. **Two** marks for each question.*

*II) **PART - B**: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.*

Q. No.		Questions	Marks	BLs	COs	POs
		I : PART - A	**10**			
I	a.	Write a C program to add two numbers using pointers.	2	L2	CO1	PO1,2,3,5,9
	b.	Define different types of priority queues.	2	L1	CO2	PO1,2,3,5,9
	c.	Differentiate between static and dynamic memory allocation.	2	L2	CO3	PO1,2,3,5,9
	d.	Define the following: i) Binary search tree ii) Complete binary tree	2	L1	CO4	PO1,2,3,5,9
	e.	Apply radix sort to arrange the following numbers in ascending order; 170, 45, 75, 90, 802, 24, 2, 66.	2	L3	CO5	PO1,2,3,5,9
		II : PART - B	**90**			
		UNIT - I	**18**			
1	a.	Write a C program to find largest of '*n*' numbers and its position using pointers.	9	L3	CO1	PO1,2,3,5,9
	b.	Write a C program to convert an infix expression to postfix expression. Trace it for the expression (A + (B – C) * D).	9	L3	CO1	PO1,2,3,5,9
	c.	Write a C program to evaluate the postfix expression. Trace it for the expression ABC + * CBA – + * where A = 1, B = 2, C = 3.	9	L3	CO1	PO1,2,3,5,9
		UNIT - II	**18**			
2	a.	Explain the advantages of circular queue over ordinary queue. Write a C program to perform various operations on circular queue.	9	L3	CO2	PO1,2,3,5,9
	b.	Explain the different operations on De-queue with suitable examples.	9	L2	CO2	PO1,2,3,5,9

Contd… 2

	c. Define recursion. Write a C program for Tower of Hanoi problem and trace the same for three discs.	9	L3	CO2	PO1,2,3,5,9
	UNIT - III	**18**			
3 a.	Write a C program to create an ordered linked list using SLL.	9	L3	CO3	PO1,2,3,5,9
	b. Write a C program to delete a node whose information field specified using DLL.	9	L3	CO3	PO1,2,3,5,9
	c. Write a function to add two polynomials.	9	L3	CO3	PO1,2,3,5,9
	UNIT - IV	**18**			
4 a.	Write a recursive function for different tree traversal techniques.	9	L3	CO4	PO1,2,3,5,9
	b. Write a function to insert an item into a binary search tree. Give an example.	9	L3	CO4	PO1,2,3,5,9
	c. Write a function to insert an item towards left and towards right of a node using threaded binary tree.	9	L3	CO4	PO1,2,3,5,9
	UNIT - V	**18**			
5 a.	Write a C program to sort the given elements using address calculation sort.	9	L3	CO5	PO1,2,3,5,9
	b. Write a C program to search for an element using probability search.	9	L3	CO5	PO1,2,3,5,9
	c. Write a C program to search for an element using ordered list search.	9	L3	CO5	PO1,2,3,5,9

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