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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

Semester End Examination; Dec. - 2019

Data Structures

Time: 3 hrs *Max. Marks: 100*

Note: i) PART - A is compulsory. **Two** marks for each question.
ii) PART - B: Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.

Q. No.		Questions	Marks
		I : PART - A	**10**
I	a.	What are the first five Fibonacci numbers? Discuss how Fibonacci series is developed?	2
	b.	Discus with an example, how to check whether a queue is full or not in circular queue?	2
	c.	Write the difference between static and dynamic memory allocation.	2
	d.	Define complete binary and almost complete binary tree.	2
	e.	Define minimum heap and max heap with example.	2
		II : PART - B	**90**
		UNIT - I	**18**
1	a.	Define stack. Write a C program to implement different operations performed on stack.	9
	b.	Define Recursion. Solve Tower of Hanoi problem using C program.	9
	c.	Convert following infix expression to prefix and postfix. Also write the representation to each, A + (((B – C) * (D – E) + F) / G$(H – J).	9
		UNIT - II	**18**
2	a.	What are the advantages of linked list compared to array? With example, illustrate how a node is inserted at front in a Single linked list? Explain.	9
	b.	Define header node with example. Explain the advantages and disadvantages of using the header node during the creation of list.	9
	c.	Define Doubly linked list with pseudo code. Explain how to insert a node to the right and left of the given node in a doubly linked list?	9
		UNIT - III	**18**
3	a.	Write a C program to reverse a list with comments.	9
	b.	What is a queue? What are the disadvantages of a normal queue in array implementation? Illustrate with example.	9
	c.	Define priority queue Explain different types of priority queue with example.	9

Contd…2

UNIT - IV **18**

4 a.	Define a Binary tree. Discuss different operations that can be performed on a binary tree with example.	9
b.	Write a C program to traverse a tree inorder, preorder and post order.	9
c.	How node is represented in binary tree? What is the purpose of internal and external nodes? Discuss with example.	9

UNIT - V **18**

5 a.	Illustrate the working of radix sort with example.	9
b.	Write a pseudo code for heap sort procedure.	9
c.	List different variations of the sequential search algorithm? Explain any two of them.	9

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