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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

December 2014/January 2015 Semester End Main Examinations

Course: Data Structures **Duration: 3 hours**
Course code: 09CI3GCDSL **Max Marks: 100**
Date: 23.12.2014

Instructions:

Answer any **FIVE** full questions, choosing one full question from each unit.

UNIT – I

1	a	Write the definitions of Data types and Data structures in C. Also discuss the requirement of Pointers in linked lists.	8
	b	Write a complete program in C to maintain a student record, which takes the usn, name and semester as input for each student. Display the student record for the given usn.	12

OR

2	a	Write a program to implement a weather station report functionality using following details. The station names are Delhi, Mumbai, Chennai and Bengaluru. There is station name, temperature and update status in the node. When the temperature is read, the update status is 1, else 0. The user can query any city's weather by providing name of the city, based on the update status temperature is printed in degrees; else "**weather not updated**" is printed.	10
	b	What are the disadvantages of lists using array implementation? Write the solutions for the same.	5
	c	Explain the benefits of using header nodes in a linked list.	5

UNIT – II

3	a	Mention four applications of linked lists. Write a program in C to implement stack operations using singly linked list.	7
	b	Write a routine *addsame* to add two long integers of the same sign represented by doubly linked list.	8
	c	Write a note on Command Line Arguments with illustrations.	5

OR

4	a	Write a C program to write record of students to a file using array of structures and from the file, print the details onto the screen (monitor).	8
	b	Explain the various file error handling operations with syntax.	6
	c	Demonstrate the frequency of occurrence of a number within a doubly linked list.	6

UNIT – III

5	a	Write an algorithm to convert a given infix expression to an equivalent postfix expression.	8
	b	Convert the following into postfix and prefix expressions A$B*C-D+E/F	5
	c	Write the stack frame to print the Fibonacci sequence for fib(6) with recursive function.	7

UNIT – IV

6	a	What is the advantage of circular queue over linear queue? Give an algorithm to insert an element and to delete an element from the linear queue.	6
	b	A Circular Queue has size of 5 and has three elements 10, 40 & 20 with F=2 and R=4. After inserting 50 & 60 what is the value of F & R. Trying to insert 30 at this stage what will happen? Delete two elements from the queue & insert 100. Show the sequence of steps with necessary diagram & give the latest value of F & R.	6
	c	Write a C program to implement Input Restricted Deque.	8

UNIT – V

7	a	Write a C program to construct Binary Search Tree. Draw BST for the following input and give the tree traversals. **14, 5, 6, 12, 18, 20, 16, 18, -1, 21**	10
	b	Write C function for inorder and postorder traversals in a binary tree.	4
	c	Explain Threaded Binary Tree with an example.	6

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