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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

July / August 2016 Supplementary Examination

Course: Data Structures **Duration: 3 hours**
Course code: 09CI3GCDSL **Max Marks: 100**
Date:03.08.2016

Instructions:

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

UNIT – I

1 a struct realType { char left; int right; }; where left represents sign of the number and right represents an integer. Write functions ***add, sub, mul*** that accepts two such structures and set the value of a third structure to represent the number that is the sum, difference and product of the two input records. 6

b Differentiate between static memory allocation and dynamic memory allocation for a linked list data structure 6

c **"*I scream you scream we all scream for icecream*"** Use circular linked list to print each word that appears in the text printed and finds the number of times the words appear. 8

OR

2 a Differentiate between malloc and realloc functions with suitable illustrations. 5

b Depict passing a function pointer as an argument to a function call. 5

c 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

UNIT – II

3 a Write a program in C to create a doubly linked list using dynamic representation. Write the functions to search the node with specified key data and to display the list. 10

b What are the functions in C to open and close an existing file. Give the prototype of both functions and explain. 5

c Write a function **insend(plist,x)** to insert the element x at the end of a list plist. 5

OR

4	a	Write a program to add two long integers using singly Linked List	8
	b	Write a function to sort the given Singly Linked list	6
	c	Explain the following file functions **i)** fseek **ii)** ftell **iii)** rewind	6

UNIT – III

5	a	Write an algorithm to convert given infix expression to equivalent postfix expression. Given stack trace for the algorithm to solve (A+B) *(C-D).	12
	b	Write a C program to implement Tower of Hanoi problem. Give stack trace for n=3.	8

UNIT – IV

6	a	Define Queue? Give the C implementation to insert and delete elements from a queue and display the contents of queue.	10
	b	Write a note on (i) Circular Queue (ii) Priority Queue with illustrations.	10

UNIT – V

7	a	Why tree is called as non-linear data structure? What are the different types of trees and explain each. Write function to know leaf node and minimum of tree.	10
	b	Write a program in C to create a binary search tree and perform inorder, preorder and postorder traversals with suitable illustrations.	10

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