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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

July 2015 Supplementary Examinations

Course: Data Structures **Duration: 3 hours**
Course code: 09CI3GCDSL **Max Marks: 100**
Date: 01.08.2015

Instructions:

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

UNIT – I

1	a	Define data structure. Explain its classification with an example.	4
	b	Explain the following dynamic memory allocation function with an example for each **i)** malloc **ii)** calloc **iii)** realloc	6
	c	Write a function to **i)** Create singly Linked List **ii)** Insert an element to the right of the given element into the Doubly Linked List **iii)** Delete last element from Circular Linked List	4+4+2

OR

2	a	Write a function to **i)** Create a Doubly Linked List **ii)** Insert a given element into sorted Singly Linked List **iii)** Delete first two consecutive nodes in the Circular Linked List	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	Write a program to merge two sorted linked list into single sorted list	8
	b	Write a function to **i)** Reverse Singly Linked List **ii)** Search an element in the Doubly Linked List	6
	c	Explain any four file opening modes with an example	6

OR

4	a	Write a program to write record of students to a file using array of structures and from the file, print the records 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	Define Stack. Give the C implementation of push and pop functions using arrays and linked list.	10
	b	Write a program in C to convert a given infix expression to its equivalent postfix expression.	10

UNIT – IV

6	a	What are the drawbacks of ordinary queue? How it is resolved in Circular queue? Explain with diagram.	6
	b	What is priority queue? Explain with example.	4
	c	Write a C program to insert and delete an element from the front end of the Doubly Ended Queue and explain the property of the deque done in the program.	10

UNIT – V

7	a	What is a tree? What are the different ways of representing a tree and give example for each?	8
	b	Write an expression tree for the following expression ab +cd-*ef+/	6
	c	Write inorder, preorder, and postorder traversals for the following tree (Figure 7c).	6

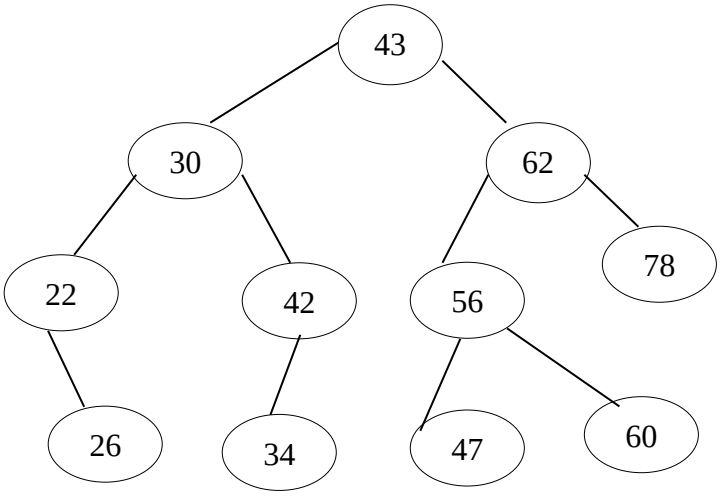

Figure 7c. Binary Search Tree

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