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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: III**
Branch: Computer Science And Engineering **Duration: 3 hrs.**
Course Code: 19CS3PCDST **Max Marks: 100**
Course: Data Structures **Date: 22.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably assumed.

UNIT - I

1	a)	Write a C syntax to initialize and declare a structure with an example.	**6**
	b)	Demonstrate the operations of stack data structure with a neat diagram.	**6**
	c)	Evaluate the given postfix expression 6 2 3 + - 3 8 2 / + * 2 ^ 3 + and show the stack content for each step.	**8**

UNIT - II

2	a)	Write a C program to implement the working of circular queue for the following operations: Insertion, Deletion and Display the status of circular queue. The program should display the suitable message for Queue Underflow or Overflow conditions.	**10**
	b)	With a neat diagram to show the insertion of values through front index and deletion through rear index in Double Ended Queue and write C functions to demonstrate the operation.	**10**

UNIT - III

3	a)	Write a C program to simulate the stack operations using singly linked list.	**8**
	b)	Write a function to insert the node at specified location in singly linked list	**6**
	c)	Write a function to delete a node based on the node information if present in singly linked list otherwise display the appropriate message.	**6**

OR

4	a)	Write a C program to demonstrate the FIFO principle using singly linked list implementation.	**10**
	b)	Write a function to perform the following operations i. To concatenate two singly linked lists. ii. To reverse a singly linked list.	**10**

UNIT - IV

5 a) Write a C program to create a doubly linked list and perform the following operations. **10**

i. Insert the new node at beginning
ii. Delete the node from the specified position
iii. Display the status of doubly linked list

b) Write a function to sort elements of doubly linked list in the ascending order **10**

OR

6 a) Write a C program to add two polynomial equations of two same or different orders using circular linked list **10**

b) Discuss any two hash functions and construct a hash table (size:13) using linear probing for the following integers: 52, 47, 36, 99, 88, 56, 38, 27, 77, 43 and 82. **10**

UNIT - V

7 a) Construct the binary search tree for the following elements 48, 68, 25, 34, 9, 67, 45, 85, 27, 8, 102. Show the growing of tree one element at a time and write a pseudo code for pre-order, in-order and post-order traversal. **10**

b) Construct a binary search tree from the following traversals. **10**
preorder: A B D H E I C F J G K L
inorder: H D B I E A F J C K G L
Show the post-order traversal for the constructed BST

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