B.E. Computer Science & Engineering (Model Curriculum) Semester - III
SE102CS - Data Structure and Algorithms

P. Pages : 2

Time : Three Hours

Max. Marks : 80

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Notes :   1.   All questions are compulsory.
          2.   All questions carry equal marks.
          3.   Assume suitable data wherever necessary.

1. a) Explain Asymptotic notations in details with example? **8**

    b) What is linear search and write a C - program to implement linear search? **8**

OR

2. a) What is abstract data types? Explain data structure operations with the help of example? **8**

    b) What is binary search and write a C - program to implement binary search? **8**

3. a) Write a C - program to count number of nodes in a singly linked list? **8**

    b) Write a C - program to implement doubly linked list? **8**

OR

4. a) Write a C - program to reverse a singly linked list? **8**

    b) Write a C - program to implement circular linked list? **8**

5. a) Explain push and pop function for stack? Write application of stack? **8**

    b) Convert following infix expression to prefix and postfix. **8**

       i) $\left((A+B-D)/(E-F)+G\right)$

       ii) $\left(A\uparrow B\uparrow C\right)/\left(D\uparrow E*(G\uparrow F)\right)$

OR
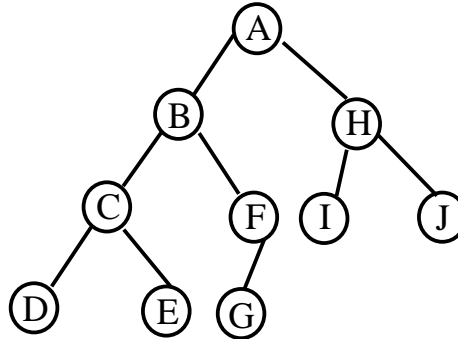
6. a) Write a menu driven program in C to implement the following functions of queue? **8**

       i) Enqueue

       ii) Dequeue

       iii) Display

       iv) Exit

	b)	Write a C - program to implement circular queue?	**8**
7.	a)	What is binary search tree? Write a function for insert, delete and search operation in BST?	**8**
	b)	Write a C - program for tree traversal method?	**8**

<p align="center">**OR**</p>

8.	a)	Write preorder, inorder and postorder for the following tree?	**6**

	b)	Explain following tree terminologies	**2**

      i)   Degree

      ii)   Complete binary tree.

	c)	Write a short note on AVL tree? Explain types of rotations with the help of suitable example?	**8**
9.	a)	Sort the following array using quick sort. 65, 70, 75, 80, ,85, 60, 55, 50, 45 Also write the algorithm.	**8**
	b)	Explain bubble sort algorithm with suitable example?	**8**

<p align="center">**OR**</p>

10.	a)	What is hashing? Solve given example by using division method with linear probing? 3, 2, 9, 6, 11, 13, 9, 12 m = 10 And h(k) = 2k + 3	**8**
	b)	Explain graph traversal technique with suitable example?	**8**

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