

DATA STRUCTURES , BCA-201

Duration: 2 Hours

Total Marks: 50

- Instructions:**
- 1) All Questions are Compulsory.
 - 2) Figures to the right indicate Full Marks.
 - 3) Start Each New Question on New Page.
 - 4) Total number of printed pages :02

Q.1 Answer the following.

(2 x 5 mks = 10 mks)

- a) Name the following.
 - i) Function Calling itself.
 - ii) data sorting technique using tree data structure.
 - iii) Data Structure based on First In First Out principle
 - iv) Linked list with 2 pointers.
- b) Explain how simple queue is different from Circular queue.
- c) Tree traversal methods can't be used for Graph traversal. Justify the statement.
- d) For given data construct tree and give depth of the tree.

A	B	D	C	E	F	null	null	I
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- e) For above constructed tree give preorder traversal.

Q2) Answer the following.

(10 mks)

- a) Name & Explain sorting technique used for the following. **(2mks)**
Input stored in array : 25 , 4 , 3 , 9
Output at 1st Iteration is : 4 , 3 , 9, 25
- b) Explain with diagram how Bubble sorting differs from Insertion sorting. **(3mks)**
- c) Name and Write the Efficient Algorithm used for data searching in an array which is in sorted order. **(5 mks)**

Q3) Answer the following.

(10 mks)

- a) Write the algorithm for implementing Push operation on Stack Data Structure. (2 mks)
- b) "Queue implementation using Linked List is efficient as compared to Array implementation". Give your opinion with Justification. (3 mks)
- c) Write Algorithm for the following. (5 mks)
- i) Add node at front to the Linked List.
 - ii) Delete node at End of Linked List.

Q4) Answer the following.

(10 mks)

- a) How is Complete Binary tree different from Strictly Binary tree. (2 mks)
- b) Draw Expression Tree for given expression below and name the right subtree nodes and the leaf nodes. (3 mks)

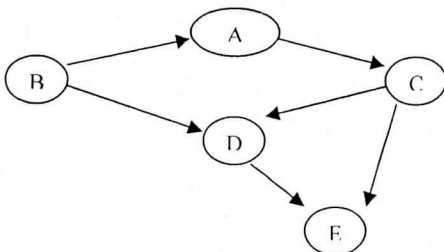
$$10 + 2 * 8 * 3$$

- c) For the given set of data Construct Binary Search Tree. (5 mks)
- 8, 3, 10, 14, 1, 6, 4, 7, 8
- Is the tree constructed an AVL Tree. Justify your answer.

Q5) Answer the following.

(10 mks)

- a) Tree traversal methods can't be applied for Graph traversal. Justify the statement (2 mks)
- b) Explain the following terms. (3 mks)
- i) Cyclic Graph
 - iii) Adjacency Matrix
 - iii) Weighted Graph
- c) For the graph given below explain the **depth first Search** traversal starting with Node B and draw the DFS Spanning tree. (5 mks)



***** ALL THE BEST *****