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BT-3/D-14 **8302**

DATA STRUCTURES

CSE-203-E

Time : Three Hours] [Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) What is the difference between structure and union ? Discuss using suitable examples.

   (b) What do you understand by Polish Notation ? Write the procedure to convert infix expression to prefix expression.

2. Differentiate between the following :

   (a) Sequential and non-sequential implementation of stack

   (b) Linear and non-linear data structures.

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Unit II

3. (a) What is a circular queue ? What are its advantages over simple queue ? Write the procedure to insert an element into a circular queue ?

   (b) What is a priority queue ? Discuss its any application.

4. (a) What is a Doubly Linked List ? Write the procedure to insert a node in a sorted doubly linked list.

   (b) Write the PUSH and POP procedure for linked implementation of stack.

Unit III

5. What is a High Balanced Tree ? What is the need of balancing a tree ? Discuss the procedure to insert a node in a AVL Tree.

6. (a) Differentiate between B tree and B+ tree.

   (b) A binary tree T has 12 nodes. The inorder and preorder traversals of T yield the following sequence of nodes :

   Preorder : G B Q A C K F P D E R H

   Inorder : Q B K C F A G P E D H R

   Construct the tree.

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Unit IV

7. (a) Write a recursive procedure to perform binary search.

   (b) Define Graph. What is the difference between a graph and a tree ? Discuss the depth-first approach to graph traversal.

8. (a) Explain the radix sort using suitable example.

   (b) What is Linear Search ? Write the procedure and discuss its time complexity for average, best and worst cases.