Printed Pages :3

*1944 *

318

NBC202

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 194402

Roll No.

M.C.A. (Dual Degree) (Semester-II)

SPL. THEORY EXAMINATION, 2014-15

DATA STRUCTURE USING 'C'

Time : 3 Hours] *[Total Marks : 100*

Note: Attempt all the questions. All questions carry equal marks.

1. Attempt any four parts of the following: 4x5=20

   (a) What is a Data Structure? What are the factors that influence the choice of a particular data structure?

   (b) Write an Algorithm to convert the Infix Expression to Postfix Expression.

   (c) What do you understand by time complexity of an algorithm? Explain Big 'O' Notation.

   (d) Write a program to delete duplicate value from a given array.

(e) Draw binary tree of the following expression:

(i) (A + B) * (C + D)

(ii) (A + B + C) * (D + E + F)

2. Attempt any four parts of the following: 5x4=20

(a) Define the STACK data structure. Write an algorithm to PUSH and POP operation.

(b) Write C function to implement queues in a linear array with two indices 'front' and 'rear', such that when rear reaches the end of the array, all the items are moved to the front of the array.

(c) Write a procedure SORT, which sorts a linked list without changing any value in information field of the node.

(d) Define the two way linked list. Discuss the advantages of two way linked list over the one way linked list in case of deleting a node whose location LOC is given.

(e) Suppose a linked list consists some numeric values. Design an algorithm to find maximum value in the list.

3. Attempt any two parts of the following: 2x10=20

(a) Write procedure of operations:

(i) B-Tree Search

(ii) B-Tree Insert

(b) Explain depth first search traversal algorithm of a graph.

(c) Write an algorithm to insert an item into a binary search tree.

4. Attempt any two parts of the following: 2x10=20

(a) Write quick sort algorithm. Explain your algorithm taking suitable example. Analyze its running time.

(b) Write a program in C which sorts a list of n items using insertion sort method. Illustrate your algorithm with an example.

(c) Illustrate the execution of HEAP – SORT on the array:

A = <6, 14, 3, 25, 2, 10, 20, 7, 6>

5. Attempt any two parts of the following: 2×10=20

(a) Write Dijkastra algorithm for finding the shortest path from a source vertex.

(b) Explain B^+ tree index files and B tree index files in detail.

(c) Write short notes on the following:

(i) AVL tree

(ii) Big-Oh Notation

—x—