

5. Attempt any two parts of the following : $10 \times 2 = 20$
- a) Write Dijkstra 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) Tree Rotation
 - (ii) Indexed sequential files

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Printed Pages : 4



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NMCA-213

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

PAPER ID : 214220

Roll No.

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M.C.A.
(SEM-II) THEORY EXAMINATION 2014-15
Data Structure Using 'C'

Time : 3 Hours]

[Total Marks : 100

Note: All questions are compulsory.

1. Attempt any four parts of the following: $5 \times 4 = 20$
- a) What is a Data Structure? What are the factors that influence the choice of a particular data structure.
 - b) What do you mean by degree of node and degree of the tree.
 - c) Obtain addressing formula for an element in three dimensional array represented in column major order.
 - d) Write an Algorithm to convert the Infix Expression to Postfix Expression.

e) Convert the following infix expression into prefix expression:
 $((2+3)*4+(5*(6+7)*8)+9).$

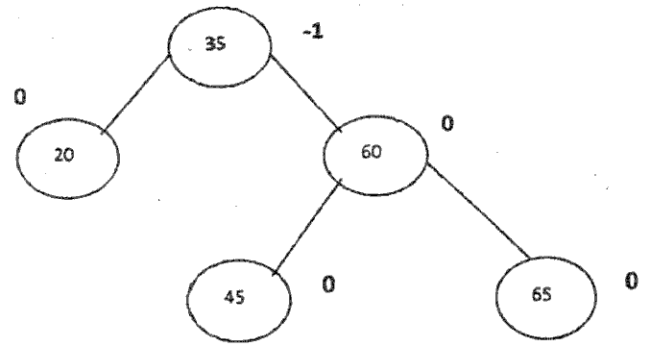
2. Attempt any four parts of the following: 5×4=20

- a) Suppose a linked list consists some numeric values. Design an algorithm to find maximum value in the list.
- 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) Differentiate between strictly and almost complete binary tree.
- d) Write a procedure SORT, which sorts a linked list without changing any value in information field of the node.
- e) 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.

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

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

- b) Define the inorder traversing. Write an algorithm/program for inorder/traversing method.
- c) Illustrate the rotations used after inserting the node value 40 into the following AVL Tree:



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

- a) Write binary search algorithm. Explain your algorithm taking suitable example. Analyze its running time.
- b) Write an algorithm to sort a list of n items using Merge sort method. Illustrate your algorithm with an example.
- c) Illustrate the execution of QUICK-SORT on the array.

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