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MCA-06/PGDCA-06/MSc.IT-06

Data Structure through C Language

Master of Computer Applications/P.G. Diploma in Computer Application/Master of Science in Information Technology

(MCA,PGDCA,M.Sc.(IT)-11/12/16/17)

Second Semester Examination 2019

Time : 3 Hrs **Maximum Marks : 80**

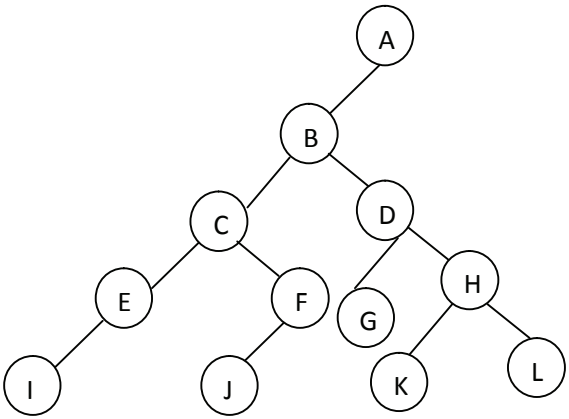
Note : This paper is of Eighty (80) marks diveded into three (03) sections A, B and C. Attempt the questions contained in these sections according to the detailed instructions given therein.

Section –A

(Long Answer Type Questions)

Note : Section 'A' contains four (04) long answer type questions of nineteen (19) marks each. Learners are required to answer any two (02) questions only. (2 x 19 = 38)

1. Explain the operations on binary trees. Write the algorithm and find the inorder, preorder and postorder traversals for the following binary tree:



2. Give an algorithm for quick sort and explain its time complexity, trace the algorithm for the following data:

   65 70 75 80 85 60
   55 50 45

3. Explain in detail about the graph traversal techniques with suitable example.
4. Write an algorithm to convert Infix expression to postfix expression. Trace the algorithm using one example and show the stack content.

Section – B
(Short Answer Type Questions)

Note : Section 'B' contains eight (08) short answer type questions of Eight (08) marks each. Learners are required to answer any four (04) questions only. (4 x 8 =32)

1. Sort the following array of elements using bubble sort:
   { 3,1,4,1,5,9,2,6,5,3,5,8,}
2. Discuss the advantages and disadvantages of both linked list and array.
3. Outline the distinguishing features of depth first search (DFS) and breadth first Search (BFS) in the context of graph.
4. Explain how the following 'infix' expression is evaluated with the help of stack :

   5*(6+2)-12/4

   Give all the operational steps.
5. Write a program to implement tower of Hanoi using recursion.
6. Explain the following:
   (i) Sequential file
   (ii) Index sequential file
   (iii) Random Access file
   (iv) Direct Access file

7. Write a C language program to create, insert and display the elements in a doubly linked list.
8. Write an algorithm for inserting an element in a circular queue and deleting an element from a circular queue.

Section –C
(Objective Type Questions)

Note : Section 'C' contains ten (10) objective type questions of one (01) mark each. All questions of this section are compulsory.

(10 x 1 = 10)

1. Heap is an example of
   a) Complete binary tree
   b) Spanning tree
   c) Sparse Tree
   d) Binary search tree

2. Which of the following is non linear data structure:
   a) Tree
   b) Stack
   c) Strings
   d) None of them

3. _____ is not the operation that can be performed on queue.
   a) Traversal
   b) Insertion
   c) Deletion
   d) Retrieval

4. Which of the following data structure store the homogenous data elements.
   a) List
   b) Pointers
   c) Records
   d) Arrays

5. Linear arrays are also called_____
   a) Vertical Array
   b) One Dimensional array
   c) Horizontal array
   d) All of them
6. Stack is also called as.
   a) FIFO
   b) FILO
   c) LILO
   d) LIFO
7. A graph is a collection fo nodes called _____and line segments called arcs as _____that connect pair of nodes.
   a) Vertices,paths
   b) Vertices, edges
   c) Graph node, edges
   d) Edges, Vertices
8. _____is the term used to insert an element into stack.
   a) Pull
   b) Pop
   c) Push
   d) None of them
9. A doubly linked list has _____pointers with each node:
   a) 0
   b) 1
   c) 2
   d) 3
10. A technique of direct search is:
   a) Hashing
   b) Tree search
   c) Binary search
   d) Linear search

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