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CSIT124

Enrol. No.

[ET]

END SEMESTER EXAMINATION : NOV. – DEC., 2017

DATA STRUCTURES USING C

Time : 3 Hrs.

Maximum Marks : 70

Note: Attempt questions from all sections as directed.

SECTION – A (30 Marks)

Attempt any five questions out of six.

Each question carries 06 marks.

1. Write an algorithm to implement Kruskal's algorithm. Also explain with the help of a suitable example.
2. Write the postfix form of each of the following infix expressions :
 - (a) $A - B + (M \& N) * (O + P) - Q / R \wedge S * T + Z$
 - (b) $K + L - M * N + (O \wedge P) * W / U / V * T + Q$
3. Write a program in C language for performing all the operations in a queue.

P.T.O.

4. (a) The inorder and preorder traversal of a tree are given below :

Inorder : DBMINEAFCJGK

Preorder : ABDEIMNCFGJK

- (i) Construct the corresponding Binary Tree.
- (ii) Determine the postorder traversal of the tree drawn. (3)
- (b) Write a program to insert a new element in the given unsorted array at k^{th} position. (3)
5. (a) Differentiate between an array and a stack.
- (b) Consider a two dimensional array A of order $[25 \times 4]$. The base address of the array is 400, words per memory cell is 4. Find the address of $A[12,4]$ using row major and column major addressing.
6. Explain the following :
- (a) Binary Tree and Binary Search Tree
- (b) Complete Binary Tree

SECTION – B (20 Marks)

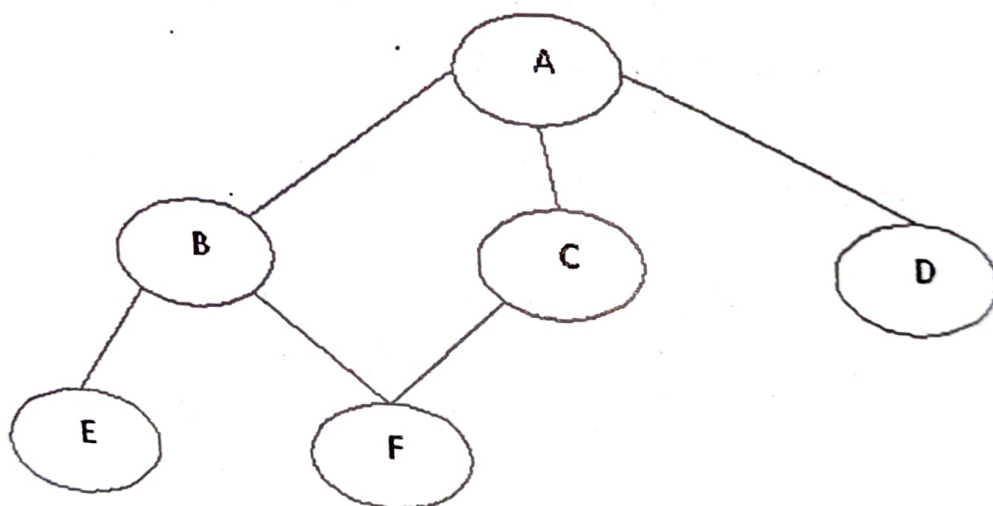
Attempt any **two** questions out of **three**.

Each question carries **10 marks**.

7. (a) Explain Quick Sort with the help of suitable example.

(b) Write a program in C language for Insertion Sort.

8. (a) Apply BFS and DFS on the below graph :



(b) Explain adjacency matrix with the help of a suitable example.

9. (a) How will you detect a cycle in a directed as well as in an undirected graph. Explain with the help of an example. (5)

P.T.O.

- (b) Explain Sparse Matrices and their types with the help of suitable examples. (5)

SECTION – C (20 Marks)
(Compulsory)

10. (a) Write a program to implement linear linked list, showing all the operations that can be performed on a linked list.
- (b) Differentiate between a singly linked list and a doubly linked list.
- (c) Write an algorithm for insertion in a sorted linked list.