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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^S*T+Z

   (b) K+L–M*N+(O ^ 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*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

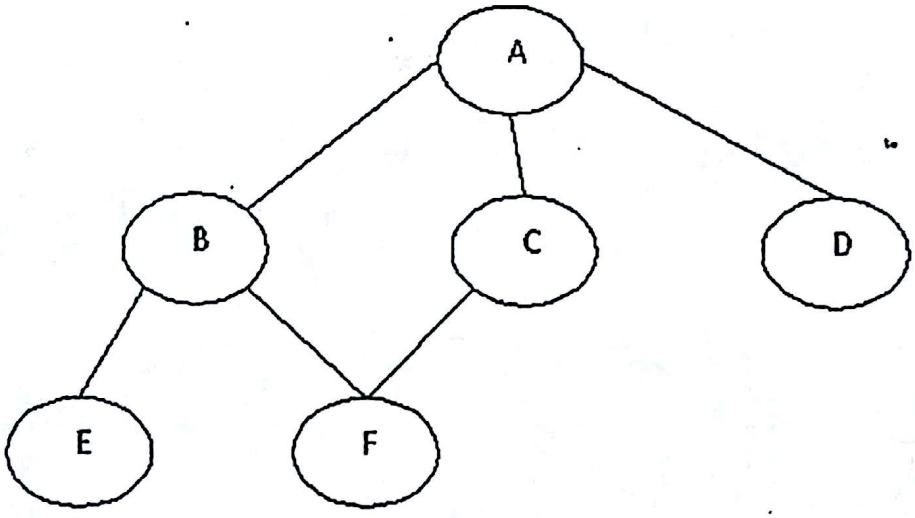
SECTION – B (20 Marks)

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.