Printed Pages – 3 TCS – 407

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

PAPER ID : 1072 Roll No. | | | | | | | | | | |

B.Tech.

(SEM IV) EVEN SEMESTER THEORY EXAMINATION, 2009-2010

DATA STRUCTURING USING 'C'

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt **ALL** the questions.*

*(ii) All questions carry **equal** marks.*

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

   (a) Define the algorithm. What are the parameters to judge the efficiency of any algorithm ?

   (b) Write an algorithm to find the product of two matrices.

   (c) What do you understand by tail recursion ? Write an algorithm to solve Tower of Hanoi problem by recursion.

   (d) Show the implementation of Stack as data structure using Linked List.

   (e) Write an algorithm to convert infix expression to its equivalent postfix expression.

   (f) Write a function in C to sort given n numbers using bubble sort.

2. Attempt **any four** parts of the following : **(4x5=20)**

(a) Explain the merits and demerits of static and dynamic memory allocation techniques.

(b) Write a program in C to add two polynomials using linked list.

(c) Discuss Queue data structure. What are the different types of queues ? Explain them.

(d) Write an algorithm which does insertion and deletion in a Queue.

(e) How it is checked whether the given Circular queue is full or empty ?

(f) Explain the term Garbage collection and Compaction.

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

(a) Define Tree. What are the different ways in which a tree can be stored in a computer memory ?

(b) What do you understand by hashing ? What is the need of using it ? Explain the collision resolution strategies used in hashing.

(c) Write algorithms for different tree traversal techniques. Trace your algorithm on any assumed tree containing at least 12 nodes.

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

(a) Write an algorithm for quick sort. Analyze its running time. Using your algorithm sort the given list of numbers.

24, 13, 58, 169, 47, 3, 58, 12, 98, 65, 6, 10, 18

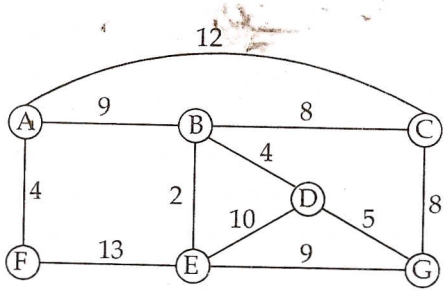
(b) Describe an AVL tree. How it is different from BST ? Also discuss the different rotations done in AVL Tree.

(c) (i) Show the result of inserting the keys F, S, Q, K, C, L, H, T, V, W, M, R, N, P, A, B in order into a empty B - Tree of order 5.

(ii) Explain Heap Sort.

5. Attempt **any two** parts of the following : **(2x10=20)**

(a) What is minimum cost spanning tree ? Draw the minimum cost spanning tree for the given graph.



(b) Write short notes on **any two** of the following :

(i) B+Tree

(ii) Indexing

(iii) Sequential Files

(c) (i) What are the different ways of implementing Graph into the computer memory ?

(ii) Explain the searching techniques done in case of a Graph.

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