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

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

B. Tech.

(SEM. IV) THEORY EXAMINATION 2010-11

DATA STRUCTURE USING C

Time : 3 Hours *Total Marks : 100*

Note : Attempt **all** the questions.

1. Attempt any **four** parts of the following : **(4×5=20)**

(a) What is a data structure ? Differentiate between primitive data structure and non-primitive structure.

(b) Explain the following :

(i) Space complexity

(ii) Time complexity.

(c) Explain the memory representation of one-dimensional array.

(d) Convert the following infix notation into postfix notation using stack :

A – B – (C*D–F/a)*E

(e) Write a program in 'C' to find whether a string is palindrome or not.

(f) Write a program in 'C' for the Fibonacci series.

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

(a) What is Dequeue ? Discuss various types of dequeues.

(b) Explain dynamic memory allocation and its advantages.

(c) Write an algorithm to delete an element from the single linked list.

(d) What is a doubly linked list ? How is it different from the single linked list ?

(e) What is a Queue ? What are the different operations which can be applied to a queue ?

(f) Write a procedure that implements circular queue.

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

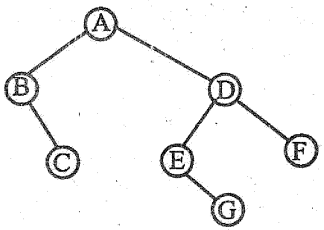
(a) What do you mean by function ? Discuss with suitable examples.

(b) Explain the following :

(i) Threaded binary tree

(ii) Complete Binary Tree.

(c) Write pre order, postorder and inorder traversal of the following tree :



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

(a) Write and explain the quick sort algorithm.

(b) What is Binary Search Tree (BST) ? Construct the BST for following insertion in order :

12, 45, 5, 38, 19, 29, 12, 18, 78, 27, 18, 2, 20,

Show the steps.

(c) The following nodes are inserted into the empty AVL tree in the following order :

5, 12, 64, 24, 30, 17, 35, 41, 12, 19

Show the construction of AVL tree.

5. Write short notes on any **two** : **(2×10=20)**

(a) Minimum cost spanning tree

(b) Graph representations

(c) File organisation.