BTS (C) 058 (C)

B.Tech. Degree IV Semester Examination November 2002

IT 403 DATA STRUCTURES AND ALGORITHMS USING 'C'

(1995 Admissions)

Time: 3 Hours Maximum Marks: 100

(All questions carry ***EQUAL*** marks)

I. (a) Give an algorithm to convert a postfix expression to prefix expression.

(b) What is the meaning of the words push and pop with reference to stack? Convert the following numerical expression into reverse polish notation and show the stack operation for evaluating the numerical result.

$$f = (2+5)(6(3+5+2))$$

OR

II. (a) Explain how arrays and structures can be represented in C, with examples.

(b) Write an algorithm to transform from prefix to postfix.

III. (a) Write procedures to add and delete an element from a circular queue.

(b) Explain how polynomials can be represented as linked list. Write the algorithm to add two polynomials.

OR

IV. What is recursion? How it is different from iteration? With an example illustrate the processes involved in a recursive solution? Discuss on efficiency of recursion.

V. (a) Define the terms:

(i) Binary tree (ii) Tree traversal

(iii) Degree of a tree, and (iv) level of a node.

(b) Discuss the internal memory representation of a binary tree using

(i) sequential (ii) linked representation.

(c) What is a threaded binary tree? Explain.

OR

VI. (a) Distinguish between height balanced and weight balanced trees.

(b) Describe the Buddy system of dynamic storage management. Discuss the representation suitable for this application.

VII. (a) Discuss the criteria to be considered in selecting a sorting method for an application.

(b) Provide an algorithm for Radix sort.

OR

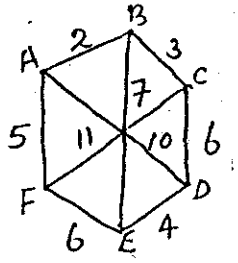
VIII. Explain 2-way merge with an example. Write the algorithm to sort an array by Merge sort.

IX. (a) Explain the implementation of a directed graph.

(b) Describe the depth first traversal in a graph.

OR

X. (a) Find the minimum spanning tree of the following graph.



(b) Explain the Kruskal algorithm.

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