

B.Tech Degree IV Semester Examination

November 2002

X

IT/CS 405 DATA STRUCTURES AND ALGORITHMS

(1999 Admissions)

Time: 3 Hours

Maximum Marks: 100

- I. (a) Explain the representation of Sparce matrix. (5)
 (b) Write a program fragment to transpose a Sparce matrix into itself. (10)
 (c) Discuss the merits and demerits of linked lists over arrays. (5)
- OR**
- II. (a) Explain the representation of polynomials using linked lists. (6)
 (b) What is the need for Garbage collection? (4)
 (c) Explain a suitable data structure to implement Garbage collection. (10)
- III. Explain the implementation of stack using arrays and linked list. Write appropriate functions to perform valid operations on stack. (20)
- OR**
- IV. Explain the implementation of circular queue using array. How an "empty queue" is distinguished from a "full queue"? Write necessary functions to perform all valid operations on circular queue. (20)
- V. (a) Explain binary tree traversals. (6)
 (b) Write an iterative function for inorder traversal. (8)
 (c) Explain the advantages of threaded binary tree over ordinary binary tree. (6)
- OR**
- VI. (a) Explain the representation of arbitrary tree using binary tree. (8)
 (b) Explain the deletion operation on binary tree. (6)
 (c) Explain the techniques for balancing heights of a binary tree. (6)
- VII. (a) Discuss the implementation of dfs and bfs graph traversals. (10)
 (b) Explain the Dijkstra's algorithm for shortest path in a graph with suitable example. (10)
- OR**
- VIII. (a) Explain the organization of hash table. How are collisions handled? (10)
 (b) Explain some methods for good hashing functions. (10)
- IX. (a) Explain the role of B-trees in file structures. (10)
 (b) Explain the organization of random access files. (10)
- OR**
- X. (a) Explain quicksort algorithm. (6)
 (b) Write an iterative program fragment for quicksort. (6)
 (c) What is a priority queue? Write appropriate function to perform operations on priority queue. (8)

