

G 8354

M.C.A. DEGREE EXAMINATION, JANUARY 2006.

First Semester

MC 1604 — DATA STRUCTURES

(Regulation 2005)

Time : Three hours

Maximum : 100 marks

PART A — (10 × 2 = 20 marks)

1. Represent the given polynomial $x^4 + 10x^3 + 3x^2 + 1$ using array data structure.
2. Specify any two applications of stacks.
3. Define binary tree.
4. Generate a binary tree from which obtain an expression $ABC**/D * E +$ through post order traversal.
5. Compare Binary search with Fibonacci search.
6. What is the best case computing time for insertion sort?
7. Define strongly connected graph.
8. Represent the following graph using adjacency list.



9. State the drawback of using sequential mapping to represent ordered lists.
10. Specify the structure of the free node used in Boundary Tag method.

PART B — (5 × 16 = 80 marks)

11. (i) Describe the procedures used to perform addition and deletion of an element in the circular queue. (8)
- (ii) Discuss the process of generating linked lists to represent Sparse matrix. (8)

12. (a) (i) Explain the threaded storage representation for binary trees. (6)
(ii) Explain Huffman algorithm to find a binary tree with minimum weighted external path length. (10)

Or

- (b) (i) Describe the non recursive procedure for inorder traversal of a binary tree. (8)
(ii) Prove the following statement :

“The maximum number of nodes on level i of a binary tree is 2^{i-1} , $i \geq 1$ ”.

(8)

13. (a) (i) Explain two way merge sort algorithm. (9)
(ii) Sort the file with record Identities (26, 5, 77, 1, 61, 11) using two way merge sort algorithm. (7)

Or

- (b) (i) Explain the following hashing functions : (12)
— Mid-Square
— Division
— Folding.
(ii) Define Height balanced tree with an example. (4)

14. (a) Explain shortest path algorithm with an example. (16)

Or

- (b) Explain critical path analysis process on Activity on Edge network. (16)

15. (a) (i) Discuss the linked list representation of generalized list. (6)
(ii) Explain the procedure to copy the generalized list. (10)

Or

- (b) (i) Discuss the functions of Garbage Collector. (6)
(ii) Explain the Compaction algorithm. (10)