

Future trends and issues in Management

Z 3504

M.C.A. DEGREE EXAMINATION, JANUARY 2007.

First Semester

MC 1604 — DATA STRUCTURES

(Regulation 2005)

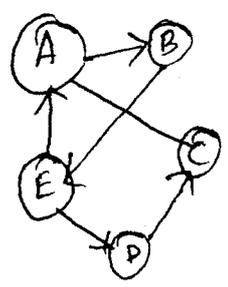
Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write an algorithm to count the number of nodes in a singly linked list.
2. Mention any two similarities and dissimilarities between stack and queues.
3. Represent the following algebraic expression into binary tree form :
 $A + (B - C) * (E + F) / G$.
4. How to represent a binary tree in memory using an array? Mention the disadvantages of using an array to represent a binary tree.
5. Sort the following numbers using Radix sort :
17, 220, 8, 45, 1845
6. What are the major differences between linear search and binary search procedures? Write their time complexity.
7. Define connected and weakly connected graph.
8. Represent the following graph using Linked list.



9. Define reference count method of automatic list management.
10. What do you mean by free list?

PART B — (5 × 16 = 80 marks)

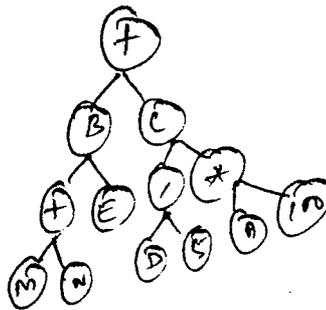
11. (a) Write the functions to perform the following operations on a singly linked list.
- (i) Adding node at between any two nodes
 - (ii) Deleting a node from any where
 - (iii) Adding node at beginning and end
 - (iv) Deleting a first and last node. (16)

Or

- (b) (i) Explain about any two applications of stack in detail with suitable example. (10)
- (ii) Write the functions to perform the insert and delete operations on queue. (6)
12. (a) (i) Discuss the various representations of a binary tree in memory with suitable example. (8)
- (ii) What are the basic operations can be performed on a binary tree? Explain each of them in detail with suitable example. (8)

Or

- (b) (i) Write the in-order, pre-order and post order traversal of a given Tree. (6)

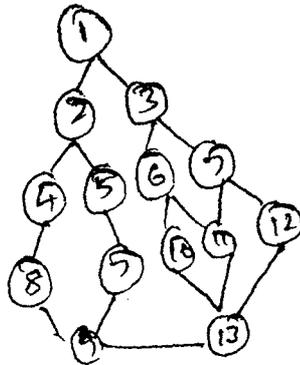


- (ii) Write a recursive algorithm to find the post order traversal of a tree. (4)
- (iii) Write briefly about Huffman Algorithm. (6)

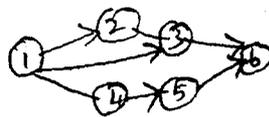
13. (a) (i) Write an algorithm to perform exchange sort procedure on the given set of integers and discuss its time complexity. (10)
- (ii) Sort the following integers using heap sort procedure : (6)
- 17, 8, 1, 33, 10, 128, 7
- (17, 8, 1, 33, 10, 128, 7)

Or

- (b) (i) What is binary search tree? Explain it with suitable example. Write an algorithm to search an element in the binary search tree. (10)
- (ii) Explain about any two hashing functions in detail with example. (6)
14. (a) (i) Find the DFT and BFT of a given graph. (4)

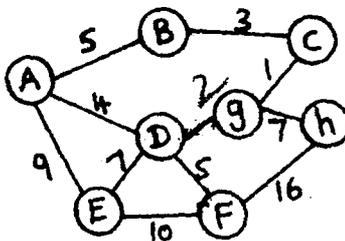


- (ii) Write the procedures to perform the BFS and DFS search of a graph. (8)
- (iii) Find the adjacency matrix and linked list representation of the following graph : (4)



Or

- (b) Find the shortest path between all pair of vertices using all pair shortest path algorithm for the following graph : (16)



15. (a) (i) Illustrate a general algorithm for marking phase with suitable example. (8)
- (ii) Discuss about general list and its operation and representations. (8)

Or

- (b) (i) What is need for compaction? Explain about compaction in detail with suitable example. (6)
- (ii) Explain in detail about automatic list management. (10)
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