Register Number: ……

M.C.A DEGREE EXAMINATIONS: JANUARY 2011

First Semester

MASTER OF COMPUTER APPLCATIONS

MCA504: Data Structures

Time: Three hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 2 = 20 Marks)

1. What is meant by an abstract data type?
2. Write the postfix expression for the infix expression (A- B) + C * D.
3. What is a complete binary tree?
4. Differentiate between internal and external nodes.
5. What is a max heap?
6. What is a multiway search tree?
7. Define indegree and outdegree in a graph.
8. What are the drawbacks of adjacency matrix representation?
9. What is meant by reference count method?
10. What is an atomic node?

PART B (5 x 16 = 80 Marks)

11. a) Write the functions to perform the following operations on a singly linked list.

(i) Adding a node to the front of the list. (ii) Deleting the first node in the list

(iii) Adding a node at the end of the list (iv) Displaying all the elements of the list.

(OR)

b) (i) Write the algorithm for converting an infix expression to a postfix expression. (8)

(ii) Write algorithms to implement the insert and delete operations in a queue. (8)

12. a).(i) Explain the algorithm for preorder, in-order and post order traversal on binary trees with suitable examples. (8)

(ii) Explain with an example how binary trees can be represented as arrays. (8)

(OR)

b) (i) Write the Huffman algorithm. State its use. (8)

(ii) What are threaded binary trees? Explain with an example. (8)

13. a) (i) Write a procedure for quick sort and explain with an example. (10)

(ii) Explain binary search in detail. (6)

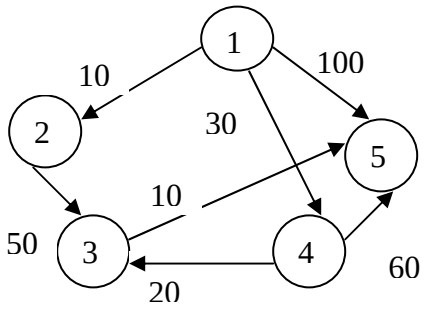
(OR)

b) (i) Write the procedure for merge sort and explain with a suitable example. (10)

(ii) Explain indexed sequential search with an example. (6)

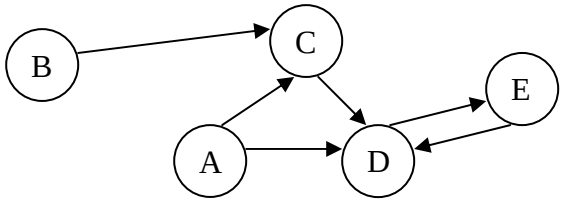
14. a) (i) Write the algorithm for breadth first traversal of a graph . (6)

(ii) Write the procedure for Dijkstra's algorithm and use it to find the shortest path for the given graph (10)



(OR)

b) (i) Write Warshall's algorithm. Use it to find the transitive closure for the given graph. (8)



(ii) Explain about linked representation of graphs. (8)

15. a) Explain

(i) The methods of representation of general lists (8)

(ii) The phases of garbage collection (8)

(OR)

b) (i) What are the general operations that can be done on a list? Give examples. (8)

(ii) Explain the process of freeing list nodes with an example. (8)

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