KUMARAGURU
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Register Number: ……

MCA DEGREE EXAMINATIONS: MAY 2015

(Regulation 2009)

First Semester

MASTER OF COMPUTER APPLICATIONS

MCA504 **:** Data Structures

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 2 = 10 Marks)

1. What is an abstract data type?
2. What is the purpose of linked list when operations are simple in an array?
3. Represent the following binary tree using linked list.

4. Define complete binary tree.
5. What is the time complexity of quick sort?
6. What is meant by hashing?
7. What is adjacency matrix? Give an example.
8. Give an example for strongly connected graph.
9. What is the purpose of reference count in maintaining the list of nodes?
10. State the advantages of compaction in storage management.

PART B (5 x 16 = 80 Marks)

11. a) (i) Explain the enqueue and dequeue operations in a queue data structure. (8)

(ii) Write an algorithm for evaluation of postfix expression using stack. (8)

(OR)

b) (i) Write insertion and deletion algorithms in a singly linked list. (8)

(ii) Explain the row major representation of two dimensional arrays with an example. (8)

12. a) (i) Explain Huffman algorithm with an example. (10)

(ii) Write an algorithm to delete an element from a list represented as a tree. (6)

(OR)

b) Explain the algorithm for tree traversals with suitable examples.

13. a) (i) Sort the following list L={K, Q, A, N, C, P, T, U, B} using Quick sort. (10)

(ii) Write the algorithm for linear search and explain with an example. (6)

(OR)

b) (i) Search for a key 100 in a list L = {2, 4, 8, 9, 17, 36, 44, 55, 65, 100} and trace the steps in searching using binary search algorithm. (6)

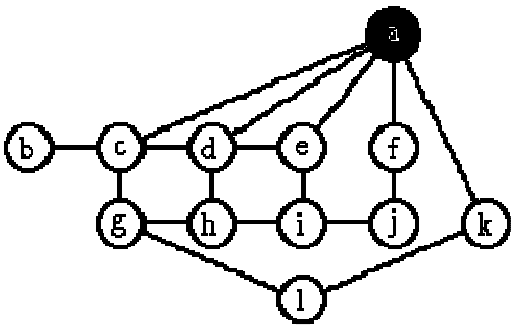
(ii) Write an algorithm to implement merge sort. Give an example. (10)

14. a) (i) Explain the various forms of how a graph can be represented in a computer. (8)

(ii) Explain the flow problem. (8)

(OR)

b) (i) Write the breadth first algorithms. Perform breadth first traversal on the following graph. (10)



(ii) Write Warshall's algorithm for transitive closure. (6)

15. a) Explain :

(i) Operations that modify a list. (8)

(ii) Linked representation of lists. (8)

(OR)

b) Explain the garbage collection mechanism in detail.

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