M.C.A DEGREE EXAMINATIONS: JUNE 2010

First Semester

MASTER OF COMPUTER APPLICATIONS

MCA504: Data Structures

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

Answer ALL Questions:-
PART A (10 x 2=20 Marks)

1. What is a priority queue?

2. What is meant by data structure?

3. What is a binary search tree?

4. Show that the maximum number of nodes in a binary tree of height H is $2^{H+1} -1$.

5. Define multiway search tree.

6. What is Selection sort?

7. Define path in a graph.

8. When is a tree said to be a complete binary tree?

9. What is Compaction?

10. What is thrashing?

PART B (5 x 16 = 80 Marks)

11. a. (i) Write a program to print out the elements of a singly linked list.   (6)

     (ii) Write a program to evaluate a postfix expression.   (10)

(OR)

b. Write a program to perform insertion and deletion operations in a doubly linked list.

12. a. Explain how deletion is carried out in a binary tree with examples.

(OR)

b. Explain with examples

     (i) Pre order traversal   (ii) in-order traversal   (iii) post-order traversal.

13. a. Write an algorithm to implement merge sort and explain it with an example.

(OR)

    b. (i) Write an algorithm to implement Quick sort.   (10)

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

14. a. Explain how a graph can be represented as linked list with an example.

(OR)

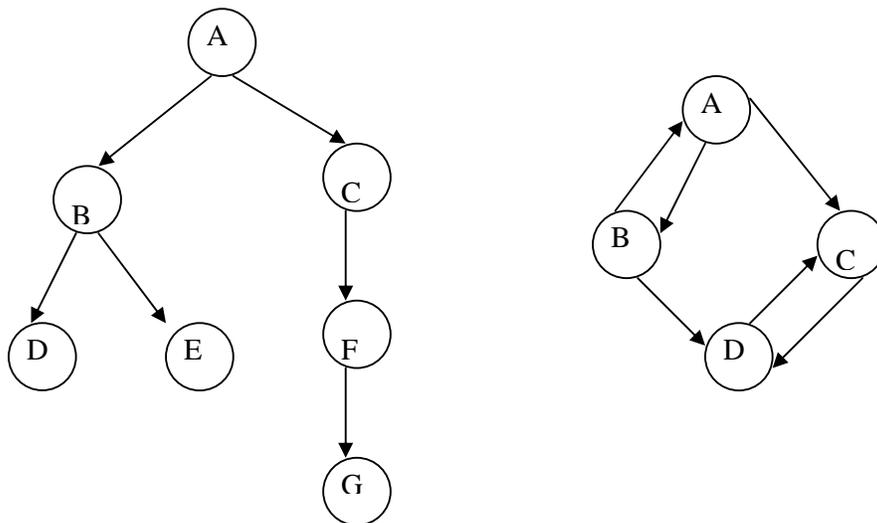   b. (i) Write Warshall's algorithm.   (6)

       (ii) For the following graphs find.   (10)

            (a) Its adjacency matrix.

            (b) Transitive closure using Warshall's algorithm.

15. a. What is Garbage collection? Explain the phases of garbage collection.

(OR)

    b. (i) Explain any 6 operations that can be performed on a linked list.   (6)

       (ii) Explain reference count method with an example.   (10)

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