

MCA DEGREE EXAMINATIONS: MAY/JUNE 2014

(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 = 20 Marks)

1. Define data structures.
2. Convert the expression $A*B - C/D$ into prefix form.
3. Define almost complete binary tree.
4. What is pre order traversal?
5. What is difference between internal and external sorting?
6. What is the time complexity of the merge sort?
7. What is transitive closure?
8. What is the need for using dijkstra's algorithm?
9. What is meant by Compaction?
10. What are the two phases of garbage collection?

PART B (5 x 16 = 80 Marks)

11. a) (i) What is queue? Write a C program to implement a queue using array. (10)
(ii) Write the abstract data type for an array. (6)
(OR)
b) (i) Write an algorithm to convert an infix expression to a postfix expression. Use it to convert the following expression into postfix form.
 $((A+B)*C-(D-E))(F+G)$
(ii) Write short notes about structures. (4)
12. a) (i) Discuss about the threaded binary trees with an example. (8)
(ii) Explain how lists can be represented as binary trees. (8)
(OR)
b) (i) Explain Huffman algorithm with a suitable example. (10)
(ii) Write an algorithm to delete an element from a list represented by a tree. (6)

13. a) (i) Write an algorithm to implement quick sort and explain it with an example. (12)
(ii) Write short notes on hashing. (4)

(OR)

- b) (i) Write an algorithm to implement shell sort. (8)
(ii) Explain binary search with an example. (8)

14. a) (i) Explain Warshall's algorithm with an example. (8)
(ii) Write the algorithm for breadth first traversal. (8)

(OR)

- b) Discuss the flow problem in detail with suitable examples.

15. a) (i) Explain the operations that modify a list. (8)
(ii) Explain reference count method. Give an example. (8)

(OR)

- b) What is garbage collection? Explain the phases of garbage collection in detail with algorithms.
