

Data Structures  
2007 November  
Technology BCA  
Semester 3  
University Exam  
Mangalore University

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BCACAC 203

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**Credit Based Third Semester BCA Degree Examination**  
**October / November 2007**  
**(New Syllabus)**

39

**DATA STRUCTURES**

Time : 3 Hours

Max.Marks: 80

PART A

Note: Answer any TEN questions from Part A.

(2x10=20)

1. a) Define the terms linear list and non linear list.
- b) Differentiate between iteration method and recursion.
- c) Give the postfix form of the expression A-B / (C\*D^E).
- d) What do you mean by array of structures? Give an example.
- e) What is an array? Give the formula to find the address of a particular location in the array.
- f) Define the terms: i. root ii. siblings.
- g) Differentiate between terminal nodes and non terminal nodes.
- h) What is a sparse matrix ? Give an example.
- i) Mention any two applications of stack.
- j) Write a short note on breadth first search.
- k) Explain sequential search method.
- l) Write a short note on selection sort method.

PART B

Note: Answer any ONE full question from each unit

UNIT - I

2. a) What is a stack? Explain any two operations performed on stack with examples.
- b) Write short note on linked allocated storage and sequentially allocated storage for lists.
- c) Write an algorithm to evaluate a postfix expression. Explain the steps using suitable example. (3+6+6)

OR

3. a) Distinguish primitive and non primitive data structures. Give an example for each.
- b) What is a priority queue? Give one application of it.
- c) Write algorithms to insert and delete elements from a circular queue.
- d) Write an algorithm to convert infix to postfix expression. (2+2+6+5)

Contd... 2

UNIT - II

4. a) Explain any three types of linked lists with neat diagrams.  
 b) Write and explain an algorithm to insert a node into doubly linked list.  
 c) Write and explain an algorithm to search for an element in a linked list. (6+5+4)

OR

5. a) Explain any two advantages of circular lists over singly linked lists. Also give one draw back of circular lists.  
 b) Write and explain an algorithm to return the maximum number in a linked list.  
 c) Write an algorithm to implement stack using linked list. (4+6+5)

UNIT - III

6. a) What is a graph? Explain any two types.  
 b) With a neat diagram explain the linked storage representation of binary trees.  
 c) What is a tree traversal? Write and explain the preorder traversal of a binary tree.  
 d) Define the following terms.  
 i. Level ii. Leaf (5+4+4+2)

OR

7. a) How to represent the graph in memory? Explain in detail.  
 b) Write recursive algorithms for postorder and inorder traversals of a binary tree.  
 c) What is a binary tree? Draw a binary tree of level 3.  
 d) Write a note on adjacency matrix of a graph. (4+6+2+3)

UNIT - IV

8. a) Show and explain the bubble sort technique for the following numbers:  
 25 10 72 18 40 11 32 9  
 b) Write and explain an algorithm to search a number in a list of numbers using binary search method.  
 c) Explain the merge sort technique with an example. (5+5+5)

OR

9. a) Explain the quick sort algorithm.  
 b) Compare sequential and binary search techniques.  
 c) Discuss the procedure and develop an algorithm to sort a list of elements using bubble sort method. (6+4+5)

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