

- (b) Discuss depth first search or breadth first search method of traversing a graph.

Or

10. (a) Define AVL tree. Consider the following list of elements :

3, 5, 11, 8, 4, 1, 12, 7, 2, 6

Describe and construct an AVL tree for these elements.

- (b) Compare B-tree with B+ -tree.

Total No. of Questions : 10] [Total No. of Printed Pages : 4

Roll No.

MCA – 203

M. C. A. (Second Semester)

EXAMINATION, Dec., 2011

(Grading/Non-Grading)

DATA STRUCTURE

(MCA – 203)

Time : Three Hours

Maximum Marks : $\begin{cases} GS : 70 \\ NGS : 100 \end{cases}$

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Unit – I

1. (a) Describe applications of stack. Differentiate stack and queue with the help of suitable examples. Write an algorithm to evaluate a postfix expression.
- (b) Translate the following infix expression into its equivalent postfix forms :
 - (i) $(A + B \uparrow D) / (E - F) + G$
 - (ii) $A + (B * C - (D \mid E \uparrow F) * G) * H$
 - (iii) $A \uparrow B \uparrow C * D$
 - (iv) $((A + B) / D) \uparrow ((E - F) * G)$
 - (v) $A \&\& B \mid \mid C \mid \mid ! (C > D)$

Or

2. (a) Describe circular queue. Write algorithm to add and delete an item from circular queue.

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- (b) What is the significance of linked implementation of stack ? Write insertion and deletion algorithm for this data structure.

Unit-II

3. (a) Describe the concept and use of doubly linked list. Write an algorithm to delete a node of doubly linked list.
- (b) Briefly explain the following :
- Singly linked list
 - Circular linked list

Or

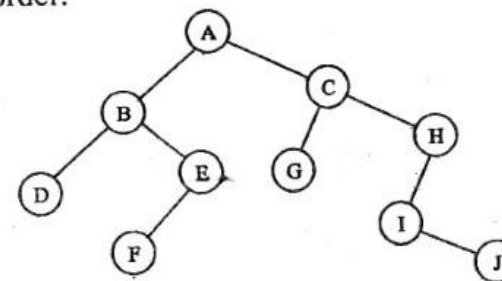
4. (a) How does a circular header linked list differ than a linear linked list ? Write a procedure to insert a new node into a circular header linked list.
- (b) A doubly linked list is created in ascending order of elements. How can the element of doubly linked list be displayed in descending order ? Write the algorithm for the method.

Unit-III

5. (a) Describe the following with the help of suitable example :
- Binary expression tree
 - Strictly binary tree
 - Complete binary tree
 - Extended binary tree
- (b) What is tree traversal ? Write recursive algorithm for various types of traversal. Explain with the help of an example.

Or

6. (a) Write non-recursive preorder traversal algorithm for binary tree. Traverse the following binary tree in preorder.



- (b) Discuss the advantages and disadvantages of a threaded storage representation for binary tree.

Unit-IV

7. (a) Write quick-sort algorithm for sorting. What is the average case and worst case time complexity of quick-sort ? Trace the quick sort algorithm for the following data :

1, 2, 3, 6, 5, 4, 7, 8, 9, 12, 11, 10

- (b) Explain Heap sort procedure with proper example.

Or

8. Binary explain the following :
- Collision resolution techniques
 - Interpolation search
 - Indexed sequential search
 - Hashing

Unit-V

9. (a) Define a graph. Explain its different representation in memory using suitable example.

P. T. O.