(Please write your Exam Roll No.) Exam Roll No. ....

END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY- JUNE 2007

Paper Code:BCA-108	Subject: Data Structure using 'C' (2005-2006 Batch)
Time : 3 Hours	Maximum Marks : 75
Note: Attempt all questions. Internal choice is indicated.	

Q1. Write notes on the following:- (2.5 x 10 =25)

(a) Stacks

(b) Sparse Matrix

(c) D-queues

(d) Reverse Polish Notation

(e) AVL Tree

(f) Doubly Linked List

(g) Recursion

(h) Hashing

(i) Heaps

(j) Time-space Trade off

Q2. (a) Write algorithm for PUSH and POP operations when an array is implemented as a stack. (6.5)

(b) Transform the following expression into its equivalent Postfix expression using stack. (3)

A+(B * C – (D/E $\uparrow$ F) * G) * H.

(c) Evaluate the followig Postfix expression (3)

2,3,10, +, *, 8, 2, /, -

OR

Q3. Given two arrays of integers in ascending order. Develop an algorithm to merge these arrays to form a third array sorted in ascending order. (12.5)

Q4. (a) A binary tree T has 9 nodes. The in-order and Pre-order traversals of T yield the following sequences of nodes. (5.5)

5, 1, 3, 11, 6, 8, 4, 2, 7   (In order)

6, 1, 5, 11, 3, 4, 8, 7, 2   (Pre-order)

Find the binary tree.

(b) Write a recursive procedure for the Post-order traversal of a binary tree. (3)

(c) Write an algorithm for insertion in a binary tree. (4)

OR

Q5. What are the advantages of Linked Lists over Array? Write a 'C' program to create a doubly linked list of integer data using the concept of structures. **(12.5)**

Q6. What is multilevel indexing? What are M-way search trees? How M-way search tree is used as indexes. Explain the deletion operation in B tree with the help of example. **(12.5)**

OR

Q7. Answer the following questions in the context of given binary tree. **(1.25 x 10 =12.5)**
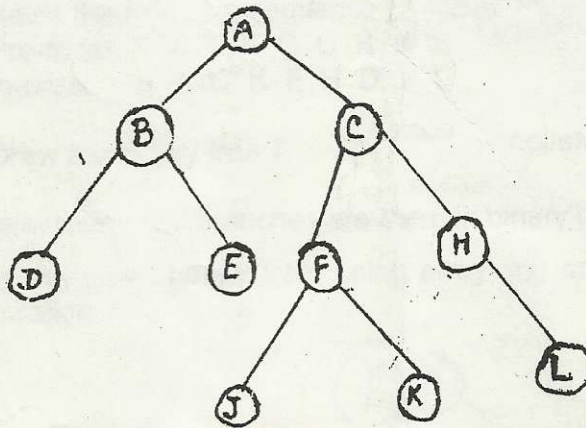
(a) Which nodes are leaf nodes?

(b) Which is the root node?

(c) What is the height of the tree?

(d) Which nodes are non-leaf nodes?

(e) Which nodes are descendents of node C?

(f) Which nodes are ancestors of node C?

(g) What is the Pre-order traversal of tree?

(h) What is the In-order traversal of tree?

(i) What is the Post-order traversal of tree?

(j) What is the level order traversal of tree?

Q8. Write a complete C program sorting an array of given integer using Insertion Sort.

77, 33, 44, 11, 88, 22, 66, 55

How many passes are required to sort the above array of integers? Write the Worst case and Average Case of Insertion Sort. **(12.5)**

OR

Q9. How binary search is different from linear search? Explain. Write a complete C program to implement binary search on given data 11, 22, 30, 33, 40, 44, 55, 60, 66, 77, 80, 88, 99 for the item 40. Discuss the complexity of binary search. **(12.5)**

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