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END TERM EXAMINATION

SECOND SEMESTER [BCA] APRIL-MAY 2009

Paper Code: BCA-108 **Subject: Data Structure using C**
Paper Id: 20108 **(Batch: 2005-2008)**
Time : 3 Hours **Maximum Marks :75**

Note: Q1. is compulsory. Attempt one question from each unit.

Q1. (a) What are collisions? Discuss collision handling techniques. (5)
(b) Define the following in context of binary trees: (3)
(i) AVL tree
(ii) Binary Search tree
(c) Write a short note on Garbage collection. (3)
(d) Write a function PUSH and POP for stack housed in an array. (5)
(e) Write a short note on Hash function. (4)
(f) What do you understand by space and time complexities of algorithms. Explain. (3)
(g) Define Recursion. (2)

Q2. (a) How can a sparse matrix be represented in memory? Explain. (4.5)
(b) Write a C function INSERT () for a circular queue. (5)
(c) Explain what are Priority queue? (3)

OR

(a) Write an algorithm to convert Infix expression into it's equivalent Postfix expression. (7)
(b) Convert the following infix expression into its equivalent postfix expression. (2.5)
A * (B+D)/E-F *(G+H/K)
(c) Evaluate the following postfix expression for A=2, B=5, C=3, D=2 E=4, ABC+DE*/-. Show stack at each step. (3)

Q3. (a) Given the following traversal order construct the Binary Tree: (4.5)
Inorder : BCAEDGHFI
PreOrder : ABCDEFGHI
(b) Write an algorithm for a function that performs insertion at a given position in a singly linked list. (4)
(c) For the given list: Construct a binary search tree (4)
19, 7, 5, 10, 20, 15, 18

OR

(a) Write a C program to implement operations: insert, delete and traverse in a doubly linked list. (8)
(b) Write an algorithm for a recursive function for the post order traversal of a binary tree. (4.5)

Q4. (a) Use an example to explain insertion and deletion in a B tree. (9)
(b) What is the advantage of using B tree for indexing. (3.5)

OR

(a) Create a B tree of order 4 for the following sequence of keys and insert 'U' into it. (12.5)
C S D T A M P I B W N G R K E H O L J Y Q Z F X V

Q5. (a) Trace the algorithm for insertion sort method for the given list 10, 7, 4, 2, 15, 6. (5.5)
(b) Write a C function for Bubble sort method of sorting. (5)
(c) What is the complexity of Insertion sort and bubble sort method? (2)

OR

(a) Using an example, explain the heap sort method of sorting. (6.5)
(b) Write a function MERGE to merge two sorted arrays A and B, of integers into a third array C. Assume both the arrays A and B are sorted in ascending order. (6)

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