

(Please write your Exam Roll No.)

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END TERM EXAMINATION**SECOND SEMESTER [BCA] MAY-2008****Paper Code:BCA-108****Subject: Data Structures using C****Paper Id: 20108****(Batch: 2005-2007)****Time : 3 Hours****Maximum Marks :75****Note: Q1. is compulsory. Attempt one question from each unit.**

- Q1. (a) Show the memory representation of 2-D arrays with an example. (2)
- (b) What are D-queues? Explain. (3)
- (c) Define Complete Binary Tree, Full Binary Tree, Degree of a Tree, Height of a Tree and Ancestors of a node. Take an example to explain. (5)
- (d) Give the Binary Tree representation of the following expression: (3)
- $$E = (a-b) / ((c * d)+e)$$
- (e) Define a B-Tree. (2)

UNIT-I

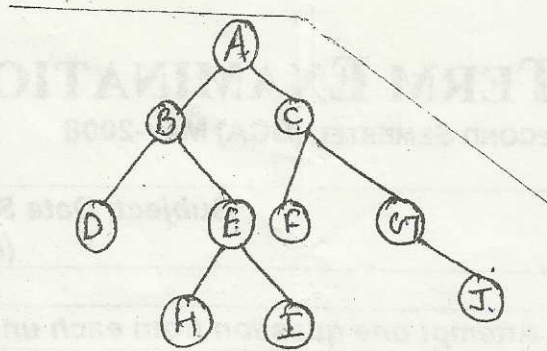
- Q2. (a) What are sparse Matrices? Discuss various types of sparse matrices. (5)
- (b) Give an algorithm to evaluate a given postfix expression. (5)
- (c) Write a 'C' function to insert an element into a Linear Queue. (5)
- Q3. (a) What is a Stack? Give the algorithm for converting a given Infix expression to its postfix notation. Using the above algorithm find the postfix expression of the following infix expression. (11)
- $$(A+B) / (C * D + E)$$
- (b) Consider a circular queue initially having 3 elements A, B, C inserted in same sequence and having a maximum capacity of 5 elements. Show the current value of FRONT & REAR. Delete 2 elements from the queue and insert 4 more elements (D, E, F, G) in the queue and show final position of REAR & FRONT. (4)

UNIT-II

- Q4. (a) Write a 'C' functions for deleting a node from the beginning of a Linear Linked list. (5)
- (b) Write a short note on doubly linked list and explain with an example deletion of a node from the middle of the list. (5)
- (c) Write a 'C' recursive function for Inorder traversal of a binary tree. (5)
- Q5. (a) Write an algorithm to search for an 'ITEM' in an already existing unordered linked list. (6)

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- (b) Give the Inorder, Preorder and Postorder traversals of the following binary tree. (9)

UNIT-III

- Q6. (a) Consider the list of following numbers: (10)
 14, 10, 17, 12, 11, 20, 18, 25, 8, 22, 23
 Create a binary search tree. Then show the various trees obtained after deletion of (i) node 11 (ii) node 22 (iii) node 20
 (b) Create a binary tree if the following Preorder and Inorder Traversals of the tree are given: (5)

Preorder :	A	B	D	F	E	J	G	C	H	I
Inorder :	F	D	B	J	E	G	A	H	I	C

- Q7. Create a B-tree of order 5 with the following keys inserted in the sequence from left to right. (15)
 a g f b k d h m j e s i r x c l n t u p
 Also show the tree after deletion of the key 'p' from the tree.

UNIT-IV

- Q8. (a) Sort the following list using Insertion sort. (7)
 44 33 11 55 77 90 40 60
 (b) What is Hashing? Discuss any two Hash functions. What is collision resolution? (8)
- Q9. (a) Give algorithm for bubble sorting. (5)
 (b) Write a 'C' function for searching an item from a given list using Binary search. Also explain the working of the algorithm by taking a suitable example. (10)
