

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1065

Roll No.

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B.Tech.

THIRD SEMESTER EXAMINATION, 2006 - 07

DATA STRUCTURES USING C

Time : 3 Hours

Total Marks : 100

Note : (i) Attempt ALL questions.

(ii) All questions carry equal marks.

(iii) Be precise in your answer.

1. Attempt *any four* parts of the following : (5×4=20)

- Distinguish between static memory allocation and dynamic memory allocation.
- What do you understand by time complexity of an algorithm ? Explain BIG Oh notation with an example.
- Derive the formula to find physical address of an element of three dimensional array stored in row major order.
- Translate the following infix expression into its equivalent postfix expression.

$$(a + b) | d \uparrow ((e - f) + g)$$

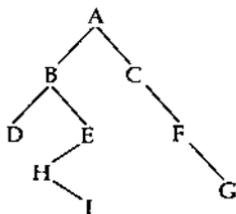
- (e) Write an algorithm to evaluate a post fix expression.
- (f) What are sparse matrices? Describe with the help of a suitable example.

2. Attempt *any two* parts of the following : (10x2=20)

- (a) What is a Circular Queue? Explain briefly and implement a queue with the help of doubly linked list.
- (b) Suppose a singly linked list L is in memory. Write an algorithm which deletes the last node from L.
- (c) Discuss how list data structure is useful to represent a polynomial and performing various operations upon a polynomial.

3. Attempt *any two* parts of the following : (10x2=20)

- (a) What is Binary tree and complete Binary tree? Write a function that finds height of a binary tree. How many binary trees are possible with four nodes?
- (b) Consider the binary tree given below.



Traverse the given tree using Preorder and Post order traversal.

- (c) Write a complete 'C' program to implement binary search algorithm.

4. Attempt *any two* parts of the following : (10x2=20)

(a) Write the Quick Sort algorithm and illustrate the steps of the algorithm for the following key values :

65, 43, 54, 26, 38, 48, 50

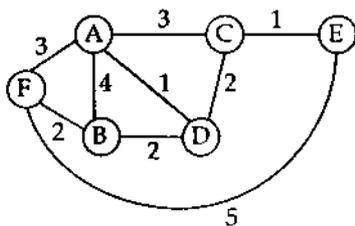
(b) Write a 'C' program for sorting 100 integer numbers using bubble sort procedures. Discuss the worst case time complexity of the algorithm.

(c) Define Binary Search tree, AVL tree and B-tree. What are the differences among them. Explain your answer with suitable examples wherever required.

5. Attempt *any two* parts of the following : (10x2=20)

(a) Write an algorithm for Breadth first traversal of a graph.

(b) What is Spanning tree ? Draw the minimum cost spanning tree for the graph given below and also find its cost.



(c) Write short notes on following :

(i) Hashing Technique

(ii) File organisation

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