D 42028 (Pages : 2)

Name.....

Reg. No.....

THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2007

CS/IT 04 302—DATA STRUCTURES AND ALGORITHMS

(2004 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. (a) What do you mean by reacord data types ? Give an example.
   (b) Give an example of a recursive algorithm.
   (c) Discuss the operation performed on linked lists.
   (d) Discuss the application of stacks and queues.
   (e) Compare and contrast "Tree Implementation" using arrays and linked lists.
   (f) Define a Tree. What are its applications.
   (g) What are the problems faced in hashing ? How are they resolved ?
   (h) What are the rules to generate a binary search tree ? Draw a BST for the following input sequence 10, 20, 15, 40, 35, 60.

(8 × 5 = 40 marks)

Part B

2. (a) Explain how time and space complexity are measured with the help of an example. (15 marks)

Or

(b) (i) Explain the concept of data abstraction with an example. (8 marks)
   (ii) What is meant by enumerated data types ? Give example. (7 marks)

3. (a) Explain algorithms to perform all operations on a queue, implemented using linked lists. (15 marks)

Or

(b) Write algorithms to add and delete elements in a stack implemented using pointers. (15 marks)

4. (a) Explain how a binary tree is implemented using linked lists. (15 marks)

Or

(b) Write algorithms for in-order, pre-order and post-order traversals in a binary tree. (15 mark

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5. (a) (i) Explain the quick sort algorithm. Illustrate with an example. (10 marks)

(ii) What do you mean by External sorting ? (5 marks)

Or

(b) (i) Compare and contrast 'linear search' and 'binary search'. (7 marks)

(ii) Write an algorithm to insert on element in a binary search tree. (8 marks)

[4 × 15 = 60 marks]