

D 2335

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Name Liboary

Reg. No.....

THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE  
EXAMINATION, DECEMBER 2009

CS/IT 04-302—DATA STRUCTURES AND ALGORITHMS

(2004 admissions)

Time Three Hours

Maximum : 100 Marks

Answer all questions.

- 1 (a) What are structures ? Give the use of structures.  
(b) What is meant by space complexity ? Why do we need to analyze the space complexity of a program ?  
(c) Explain the different ways to check whether the stack is full or empty.  
(d) List the advantages of linked list and over arrays.  
(e) Distinguish between general trees and binary trees.  
(f) Explain the depth first search algorithm on a graph.  
(g) Explain bubble sort algorithm with example.  
(h) What is the use of hashing functions ? List the various methods used for the construction of hashing function.

(8 × 5 = 40 marks)

- 2 (a) Define an Array. Give the general form of one-dimensional, two-dimensional and multi dimensional array. Express the address calculation methods and the way the array is initialized

Or

- (b) Explain the different ways by which strings can be stored. Explain the various operations on strings

(10 marks)

- 3 (a) (i) Explain the two ways of implementing stack.  
(ii) Write the operations that can be performed on a queue

(10 marks)

(5 marks)

Or

- (b) Explain the different operations on a doubly linked list.

(15 marks)

- 4 (a) Write the algorithm to convert a general tree to binary tree. What is threaded binary tree ? Explain the various operations on threaded binary tree.

Or

- (b) Explain the three different ways of representing graphs.

(15 marks)

Turn over

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5) (a) What is a heap? Write and explain the heap sort algorithm. Derive the complexity of a heap sort algorithm.

OR

(b) Write the algorithm for linear search technique. Explain the steps with simple example. Compare linear search with binary search technique.

(15 marks)

[4 + 15 = 60 marks]

