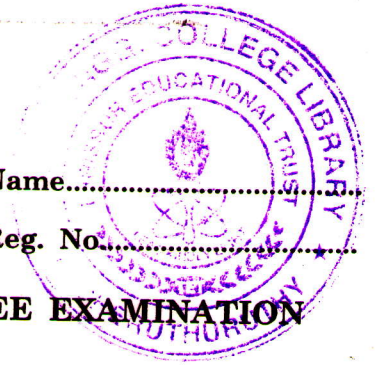


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Name.....

Reg. No.....



**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
DECEMBER 2010**

CS/IT 04 302—DATA STRUCTURES AND ALGORITHMS

Time : Three Hours

Maximum : 100 Marks

1. (a) What is an array ? Explain the method of address calculation for two-dimensional array in row-major order and column major order.
- (b) List the different methods of representations of strings.
- (c) Explain how a postfix expression can be evaluated using stacks.
- (d) What is priority queue ? Give the use of priority queue.
- (e) What are the advantages and disadvantages of linked representation of binary tree ?
- (f) Define a graph. What is meant by in-degree and out-degree of a vertex ?
- (g) What is external sorting ? Give the need of external sorting techniques.
- (h) Write the sequence of steps to be followed in binary search method.

(8 × 5 = 40 marks)

Part B

2. (a) Explain how space and time complexity of algorithms are measured.
Or
(b) What is recursion ? List the properties of recursive algorithms. Write a recursive algorithm to find the factorial agn. Analyse the program.
(15 marks)
3. (a) Write notes on :
(i) Representation of a queue. (8 marks)
(ii) Operations on a queue. (7 marks)
Or
(b) Write algorithms (i) to search for an element in a singly linked list ; (ii) to implement linked list using pointers.
(8 + 7 = 15 marks)
4. (a) Explain the various operations that can be performed on a binary tree.
Or
(b) Explain any *three* applications of trees.
(15 marks)
5. (a) (i) Write the steps involved in insertion sort and explain it with an example. (7 marks)
(ii) Write any *two* simple hashing function. (8 marks)

Or

- (b) What is hashing ? Explain the methods used for the construction of hashing functions.

(15 marks)

[4 × 15 = 60 marks]