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Name.....

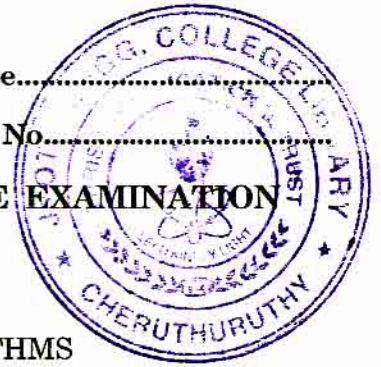
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**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
DECEMBER 2012**

Computer Science Engineering

IT/CS 04 302—DATA STRUCTURES AND ALGORITHMS

(2004 Admissions)



Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

1. (a) Differentiate Iteration and Recursion.
- (b) What about Garbage Collection ?
- (c) Write notes on basic operations performed on any data structure ?
- (d) Define Stack and Queue. Give its types and applications.
- (e) How tree and graph are differentiated by their representations and applications ? Give an example.
- (f) How binary search tree is different from binary tree ?
- (g) Write the time complexities of bubble sort and quick sort for an unsorted arrays. Show with an example.
- (h) Compare and discuss about internal and external sorting techniques.

(8 × 5 = 40 marks)

Part B

2. (a) Discuss in detail about importance of recursive techniques in analyzing algorithms. (10 marks)
- (b) Write short notes on time complexity and space complexity. (5 marks)
- Or*
- (c) Explain in detail various data types with suitable examples. (15 marks)
3. (a) Explain the procedure to delete a node with a given item of information in a singly linked list. Give suitable example. (15 marks)
- Or*
- (b) What is Queue ADT ? Explain the operations involved in circular queue with procedures and suitable examples. (15 marks)
4. (a) Construct a binary tree to satisfy the following orders :
Inorder : D B F E A G C L J H K
Postorder : D F E B G L J K H C A

Write the algorithm a binary tree operations involved in this example.

(10 marks)

Turn over

(b) Write short notes of graph traversal techniques.

(5 marks)

Or

(c) Explain the difficulties involved in inserting elements. In hash table using separate chaining and linear probing, how collisions are handled? Write the routines for inserting, searching and removing elements from the hash table for these techniques.

(15 marks)

5. (a) Explain the backtracking technique used to solve the 4-queens problem.

(15 marks)

Or

(b) Explain the procedure for Insertion sort and sort the following array :

77, 33, 44, 11, 88, 22, 66, 55.

(15 marks)

[4 × 15 = 60 marks]