



Reg. No. :

Name :

**Fourth Semester B.Tech. Degree Examination, May 2013
(2008 Scheme)
08.405 : DATA STRUCTURES AND ALGORITHMS (RF)**

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions

1. Define priority queue. Give any one application.
2. What is meant by structured programming ?
3. What is the use of frequency count in analyzing algorithms ?
4. Give the prefix and postfix representations for the following infix expression :
(a + b) * c - d/f + g + h.
5. Explain how a binary tree is represented using one dimensional array.
6. List any two applications of graph data structure.
7. Write a short note on garbage collection.
8. The Ackerman function, for all non-negative values of m and n is recursively defined as :

$$A(m, n) = \begin{cases} n + 1 & , \text{ if } m = 0 \\ A(m - 1, 1) & , \text{ if } m \neq 0 \text{ but } n = 0 \\ A(m - 1, A(m, n - 1)) & , \text{ otherwise} \end{cases}$$

What is the value of A (2, 2) ?

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9. What is hashing ?
10. What is the maximum number of edges in a n-node undirected graph without self loop ?

(10×4=40 Marks)

P.T.O.



PART – B

Module – I

11. a) Explain the implementation of two stacks using one array, efficiently.
- b) Explain the algorithm for inserting a node into a doubly linked list.

OR

12. a) Explain the representation of polynomial using linked list. Use it for adding two polynomials.
- b) Explain stepwise refinement techniques.

Module – II

13. a) Write a non-recursive algorithm for inorder traversal.
- b) Explain any two methods of representing graphs, with examples.

OR

14. a) Write an algorithm to delete a node from a given binary search tree. Give examples.
- b) Explain storage compaction.

Module – III

15. a) Explain quick sort algorithm. Derive its best case and worst case time complexity.
- b) Explain collision resolution techniques.

OR

16. a) Explain the working of heap sort algorithm for the following input :

35, 37, 61, 84, 73, 25, 53, 46, 39, 93.

b) Explain :

- i) insertion sort algorithm and
- ii) binary search algorithm.

(3×20=60 Marks)