



Reg. No. :

Name :

Fourth Semester B.Tech. Degree Examination, February 2015
(2008 Scheme)
08.405 : DATA STRUCTURES AND ALGORITHMS (RF)
(Special Supplementary)

Time : 3 Hours

Max. Marks : 100

Instruction : Answer **all** questions from Part **A** and **any one** question from **each** of the Module of Part **B**.

PART – A

1. Explain Big Oh notation for analyzing algorithms using an example.
2. Derive the address translation formula for lower triangular matrix when stored as one dimensional array.
3. What are the advantages of structured programming ?
4. Write a function that takes a list L and determines whether L contains any repeated items.
5. Give the binary tree representing $(A + B) * ((C - D) / (E + F) * G)$.
6. Compare a recursive algorithm with its equivalent iterative one.
7. Give the two representations of a graph.
8. Explain the terms best case, worst case and average case complexity of algorithms using binary search as an example.
9. Give the recursive algorithm for postorder traversal of a binary tree.
10. Give definitions of Full Binary tree and complete binary tree.

(10x4=40 Marks)





PART – B

Module – I

11. a) Explain dynamic storage management using boundary tag method. 4
- b) Write a function for the **first fit** strategy of memory allocation using linked list. 12
- c) What change in the organization of the linked list is required to make the **first if** into **best fit** ? 4
12. a) Obtain a data representation mapping a deque into a one dimensional array. Write algorithms to add and delete elements from either end of the deque. 12
- b) Give algorithms for converting an infix expression to postfix form. 8

Module – II

13. a) Illustrate the algorithm for deleting an item from a Binary Search Tree and give its implementation. 12
- b) What are threaded Binary trees ? 8
14. a) Give an algorithm for Breadth First Search and illustrate it with an example. 8
- b) Give Dijkstra's algorithm for finding the shortest path. 12

Module – III

15. a) Define stability of Sorting. Give two sorting methods which are not stable. 4
- b) Give the algorithm for Heapsort and derive its time complexity. 12
- c) Give an application of Heap. 4
16. a) What is hashing ? Give any two hashing methods. 4
- b) What are the methods used for handling collision while hashing ? 4
- c) Let N be the number of data under sort which is residing in a magnetic tape. The whole data is divided into n blocks of equal size which is decided by the capacity of the internal memory. Illustrate how balanced two-way merge sort is used for sorting this data. 12