



Reg. No. :

Name :

Fourth Semester B.Tech. Degree Examination, June 2016
(2008 Scheme)
08.405 : DATA STRUCTURES AND ALGORITHMS (RF)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions :

1. Explain any two applications of stack.
2. Write a short note on documentation.
3. What is meant by structured programming ?
4. Construct expression tree for the following :
 $a/b + c - (d + e) * f - (g + h)$
5. What is threaded binary tree ? Give example.
6. Explain the recursive algorithm for depth first search of a graph.
7. What is meant by stability of sorting algorithms ?
8. Prove that, for any non-empty binary tree T, if n_0 be the number of leaves and n_1 be the number of nodes of degree 2, then $n_0 = n_1 + 1$.
9. What is the maximum number of edges in a n-node undirected graph without self loop ?
10. Compare linear and binary search algorithms. **(10x4=40 Marks)**



PART – B

Module – I

11. a) Explain the implementation of circular queue data structure using linked list.
b) Explain stepwise refinement techniques.

OR

12. a) Explain the algorithm for converting a given infix expression to postfix notation.
Illustrate with the example. $a + b + c/(d - e) * (f - g) + b$
b) Write an algorithm for deleting a node from a singly linked list.

P.T.O.



Module - II

13. a) Write an algorithm to compute the height of a given binary tree.
b) Explain boundary tag method.

OR

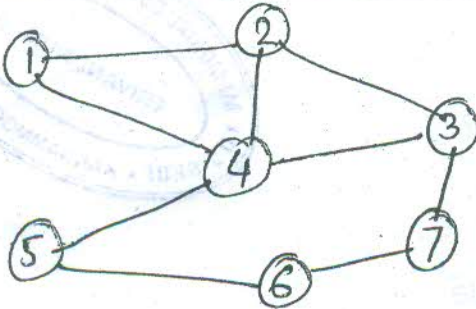
14. a) Given the preorder and inorder sequence, draw the resultant binary tree and write its post order traversal :

Pre-order : A, B, D, G, H, E, I, C, F, J, K

In-order : G, D, H, B, E, I, A, C, J, F, K

State briefly the logic used to construct the tree.

- b) Explain BFS algorithm. Construct BFS spanning tree for the following graph :



Module - III

15. a) Explain the working of merge sort algorithms for the following input :
87, 65, 34, 67, 81, 76, 53, 82, 42, 23
b) Explain sorting with tapes.

OR

16. a) Explain heap sort algorithm. Give time complexity.
b) Define hashing. Explain various hashing functions.

(3x20=60 Marks)