

24032

**B. Tech. 3rd Semester (IT) F. Scheme
Examination, December-2014
DATA STRUCTURE USING 'C'
Paper-CSE-201-F**

Time allowed : 3 hours]

[Maximum marks : 100

Note : Q. No. 1 is compulsory. Attempt four questions by selecting one question from each section. All questions carry equal marks.

1. (a) What do you mean by balanced trees ? 3
- (b) What are the difference between arrays and linked lists ? 4
- (c) What is the algorithm to find out the height of a binary tree ? 4
- (d) What are binary search trees and what is it mainly used for ? 3
- (e) What are main three properties of heaps ? 3
- (f) How do you define O-notation ? 3

Section-A

2. (a) What is mean by time and space complexity of an algorithm ? Illustrate with suitable examples. 10
- (b) Define a 'Stack' ? Explain its typical three applications. Also write code in C for PUSH and POP operation on a stack. 10

3. (a) What is postfix notation ? State the relevance of such a notation. Also give the postfix notation of the following : 10
- (i) $((A + B) * C / D + E * F) / G$
- (ii) $A * B - (C + D) - (E - F) + H / F * I$
- (b) What is data structure ? Explain the importance of data structure in the Computer Science. 10

Section-B

4. (a) What is doubly linked list ? Describe the procedures for inserting and deleting nodes from a double linked list with an example. 12
- (b) Write an algorithm to swap two consecutive nodes of a linked list having location LOC1 and LOC2. 8
5. (a) What is linked-list ? Illustrate the use of linked lists to represent the polynomial :
 $3X^3Y^2 - 6X^2Y^2 - 4XY + 8Y^3$ 10
- (b) What is a circular queue ? Write an algorithm to implement circular queues using array for enqueue (), dequeue () and display () operation. 10

Section-C

6. (a) What is binary tree ? Write non-recursive algorithm for pre order of a binary tree. 10
- (b) Write an algorithm to find the sum of all nodes of binary tree. 10
7. (a) Insert the following entries into an initially empty B-tree of order 5. 10
{ 1, 7, 6, 11, 3, 8, 14, 10, 4, 18, 9, 19, 24, 5, 12, 13, 20, 21, 22 }
- (b) Write an algorithm that inserts an edge into an undirected graph represented using an adjacency matrix. 10

Section-D

8. (a) What do you mean by file organization ? What are different file access methods ? Illustrate. 10
- (b) What are sets ? What are list representations of sets ? Illustrate their significance. 10
9. Explain the following :
- (a) AVL Tree 10
- (b) Skip Lists. 10