

CS - 113/IT - 111**B.E. (All Branches), I Year I Semester**

Examination, December 2015

Choice Based Credit System (CBCS)**Data Structure - I***Time : Three Hours**Maximum Marks : 60*

- Note:* i) Attempt any five questions.
 ii) All questions carry equal marks.

1. a) Define Data, information, algorithm and data structure. Give the difference between linear and non-linear data structures.
 b) What is Recursion? Explain different types of recursion. Which data structure is used to perform recursion and Why?
2. a) What do you mean by array? Explain both the process of implementation of two dimensional arrays in memory.
 b) What is Searching? State the step by step procedure of Binary Search? Also state its complexity.
3. a) What is Stack? Write Push() and Pop() functions of stack when stack is implemented with singly linked list.
 b) Explain the algorithm for converting infix to postfix using Stack. Also convert the following infix expression to postfix : $a*(b+(c-a)/d)-e*d$.

[2]

4. a) What is linked list? Write an algorithm for inserting an element at a specific location in a singly link list.
 b) Postorder traversal of a given binary search tree. T produces the following sequence of keys :
 10, 9, 23, 22, 27, 25, 15, 50, 95, 60, 40, 29
 What are the result of an in-order and pre order traversal of the tree T?
5. a) What is Bubble sort? Arrange the given array using bubble sort [12, 4, 5, 10, 1, 9, 2].
 b) Explain breadth first search algorithm for the traversal of any graph with suitable example.
6. a) What is Queue? Describe the concept of circular queue. How it is better than linear queue?
 b) What is graph? Explain any one algorithm for finding minimum spanning tree.
7. Write short notes on any three of the following :
 a) Static and Dynamic Memory Allocation
 b) Priority queue
 c) Depth First search
 d) Quick sort