National Institute of Technology, Delhi

Name of the Examination: B. Tech.			
Branch	: All Branches	Semester	: II
Title of the Course	: Data Structures	Course Code	: CSB 102

Time: 2 Hours   Maximum Marks: 25

Note :All questions are compulsory.

SECTION A

Q1) Attempt all parts.   [5* 2]

a. What are *Big Oh* and *theta* notations. Explain mathematically.

b. What do you understand by static and dynamic memory allocation. Support your answer with example.

c. Let B be a two dimensional array of integer declared as follows:
$B[50... 250] [300... 550]$; Assuming the array is stored in row-major order and the first element of the array is stored at location 1000, what is the address of element $B[199][485]$?

d. Write an algorithm or a function to count the number of even and odd elements present in an integer array. For example
A[]={2,5,7,9,10,3,19,20}
No of even elements = 3
No of odd elements =5

e. What are the major differences between array and link list?

SECTION B

Q2). Write a program to accept an array from user and sort that array using bubble sort. Apply binary search over the sorted array to find a particular element provided by user.   [5 marks]

Q3.) What is a heap sort? Briefly describe the various steps and procedures involved in Heap sort.
[5 marks]

Q4. List out some applications of stacks. Write a program to implement stacks using linked list.
[5 marks]