

**Model Paper– 1**  
**Hi-Tech Institute of Engineering & Technology**  
**B.C.A. Examination**  
**(Semester-3<sup>rd</sup>) Odd Semester**  
**Data Structure Using C and C++**  
**(BCA-302)**

**Time: 3 Hours**

**Maximum Marks: 75**

**Faculty Name:** Mr. Shivam Singh Rana

**Note:** Attempt questions from all sections as per instructions.

**Section – A**

**Note:** Attempt all questions.

5 x 3 = 15

1. What do you understand by Data Structure?
2. What is an array?
3. Define Stack and Queue with an example?
4. Describe the application of Stack?
5. What is inserting Algorithm?

**Section – B**

**Note:** Attempt any two questions.

2 x 7.5 = 15

6. What do you mean by Sparse Matrix. Explain how a sparse matrix is represented in memory?
7. Write an Algorithm to delete last node from a linked list?
8. What is D-queue. Explain the Insertion and Deletion operation with the help of suitable example?

**Section – C**

**Note:** Attempt any three questions.

3 x 15 = 45

9. Write a short note
  - a. BST
  - b. B-tree
10. a) Explain Multi dimensional Array.  
b) Make a Binary Search Tree for given Data.(14,15,4,9,7,18,3,5,16,4,20,17,9,14,5)
11. Explain Merge Sort Algorithm and show step by step procedure to sort the data.
12. Explain binary Search and Linear Search? Give the supportive example of both?
13. Why Doubly linked list is better than linked list. Justify it by giving the difference between both of them?