

Roll No. 

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**Total No. of Pages: 02**  
**Total No. of Questions: 07**

**B. C. A. (Sem.-3<sup>rd</sup>)**  
**DATA STRUCTURE**  
**Subject Code: BSBC-302**  
**Paper ID: [B0229]**

**Time: 3 Hrs.****Max. Marks: 60****INSTRUCTIONS TO CANDIDATE:**

1. Section-A is compulsory.
2. Section-B Attempt any four questions.

**SECTION-A**

**Q. 1.**

- (a) Define problem analysis?
- (b) What is use of Big O notations?
- (c) Write an algorithm to insert an element in a linked list.
- (d) Define time space trade off.
- (e) List various uses of tree data structure.
- (f) What is need of doubly linked list?
- (g) List various applications of queue data structure.
- (h) Define an array? How it is represented in memory?
- (i) Discuss how an array is different from linked list.
- (j) What is dynamic storage management? Discuss its need.

**Section-B**

- Q. 2.** What is data structure? Discuss different types of data structures with their characteristics features. (10)
- Q. 3.** Write notes on the following:- (10)
- (a) Recursion
  - (b) Priority queue and its uses.

- Q. 4.** What is bubble sort? Write and explain an algorithm for bubble sort. Sort the following list of numbers using bubble sort: (10)  
144, 331, 76, 12, 52, 115, 35, 6, 1, 98, 62
- Q. 5.** What is binary search? What are its advantages over linear search? Write and explain an algorithm for searching an element using binary search. (10)
- Q. 6.** Define tree and binary tree. Explain preorder and postorder tree traversal algorithm by taking suitable examples. (10)
- Q. 7.** Define stack. How it is different from queue. Write an algorithm to implement stack using linked list. (10)

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