

BT-3/D-20**43132****DATA STRUCTURE AND ALGORITHMS****PC-CS201A**

Time : Three Hours]

[Maximum Marks : 75

Note : All questions in Part A and Part B are compulsory.
Attempt any *four* questions from Part C selecting *one* question from each Unit.

Part A1. Answer the following questions : **5×3=15**

- Differentiate non-primitive data structure with example.
- Write time complexities of Quick sort and Bubble sort.
- Differentiate Recursive and Non-recursive binary search.
- Give example of balanced multi way search trees.
- Compare of linked and sequential storage representation.

Part B

- Write various steps involved in designing and development of an algorithm. **5**
- Write algorithm to insert an element in stack. **5**
- Write algorithm for delete an element from a linked list. **5**
- Explain BFS in detail. **5**

Part C**Unit I**

- Discuss various types of Array. Explain multi-dimensional array with example. **10**
- Differentiate bubble and radix sort with example. **10**

Unit II

- Derive equation to determine the time complexity of merge sort. **10**
- What are the applications of queue ? Write algorithm for priority queue. **10**

Unit III

- Discuss the concept of header link list. What are the applications of linked list ? **10**
- Discuss the dynamic implementation of stack with example. **10**

Unit IV

- Write properties of AVL tree. Make an AVL tree having elements 5, 10, 20, 30, 40, 45, 50, 60 and 70. **10**
- Explain B+ Tree and Threaded tree with example. **10**