Roll No. ..... Total Pages : 03

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 A

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

(i) Differentiate non-primitive data structure with example.

(ii) Write time complexities of Quick sort and Bubble sort.

(iii) Differentiate Recursive and Non-recursive binary search.

(iv) Give example of balanced multi way search trees.

(v) Compare of linked and sequential storage representation.

Part B

2. Write various steps involved in designing and development of an algorithm. **5**

3. Write algorithm to insert an element in stack. **5**

4. Write algorithm for delete an element from a linked list. **5**

5. Explain BFS in detail. **5**

Part C

Unit I

6. Discuss various types of Array. Explain multi-dimensional array with example. **10**

7. Differentiate bubble and radix sort with example. **10**

Unit II

8. Derive equation to determine the time complexity of merge sort. **10**

9. What are the applications of queue ? Write algorithm for priority queue. **10**

Unit III

10. Discuss the concept of header link list. What are the applications of linked list ? **10**

11. Discuss the dynamic implementation of stack with example. **10**

Unit IV

12. Write properties of AVL tree. Make an AVL tree having elements 5, 10, 20, 30, 40, 45, 50, 60 and 70. **10**

13. Explain B+ Tree and Threaded tree with example. **10**