Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 02

Total No. of Questions : 07

BCA (2011 & Onward) (Sem.–3)
DATA STRUCTURES
Subject Code : BSBC-302
Paper ID : [B0229]

Time : 3 Hrs.   **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and a student have to attempt any FOUR questions.**

SECTION –A

Q.1 Write briefly :

a) Describe linear and non-linear data structures.

b) Describe in brief about the traversing, sorting and searching.

c) What do you mean by time-space trade-off?

d) What is the difference between FIFO lists and LIFO lists?

e) What is overflow and underflow?.

f) Differentiate between linear and binary search.

g) Define recursion.

h) Define Polish Notation.

i) What is degree of a node in a tree?

j) What are circular queues?

SECTION-B

Q.2 a) What is an algorithm? What are its characteristics?

b) How to find complexity of an algorithm? What is the relation between time and space complexity of an algorithm?

Q.3 What is a single linked list? What are the various operations performed on a single linked list? Write an algorithm to insert a node after a given node in a linked list.

Q.4 Name and explain various searching techniques. Give suitable examples. Implement any one algorithm to search an element from a list of N numbers.

Q.5 What are queues? How are queues implemented in memory? What are the various queue operations? Write algorithms for each.

Q.6 Explain bubble sort technique with algorithm. Use bubble sort algorithm to sort the following list of numbers :

70, 30, 40,10, 80, 20, 60, 50

Q.7 What are binary trees? Enlist various binary tree traversal techniques. Apply these techniques to traverse the following tree :

```
                A
              /   \
            B       C
           / \       \
          D   E       F
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