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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:**

- 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?

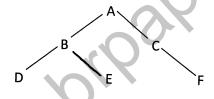
**1** M-10058 (S3)-1255

## **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:



**2** | M-10058 (S3)-1255