

Roll No.

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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

INSTRUCTIONS 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 students has to attempt any **FOUR** questions.

SECTION-A

1. Write briefly :

- a) Define Big-O notation.
- b) Write down limitations of the array data structure.
- c) Explain the dequeue operation on a queue.
- d) What factors affect the efficiency of an algorithm?
- e) Write a recursive definition for generating a Fibonacci number.
- f) How many nodes does a shortest linked list have? How many nodes does longest linked list has?
- g) How is the height of a tree defined? What is the height of a tree with a node?
- h) What does 'priority' mean in a priority queue?
- i) Write down the best, worst case performance of bubble sort algorithm.
- j) What is the difference between a circular linked list and a circular queue?

SECTION-B

2. Suppose an ordered list is to be searched for finding a number. Write the algorithm along with its best case, average, and worst case performance. (4,6)
3. What is a stack? What are its applications in computer science? Write down steps to insert and remove elements from a stack. (2,3,5)
4. *A linked list does not have to be implemented with pointers only.* What is the other implementation of a linked list? Explain. (10)
5. What is a binary tree? Discuss the tree traversal approaches? (2,8)
6. Write short notes on : (5,5)
 - a) Garbage Collection.
 - b) Recursion.
7. Write down the algorithm to sort a list using selection sort. Discuss its complexity. (7,3)