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

## 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.
3. What is a stack? What are its applications in computer science? Write down steps to insert and remove elements from a stack.
4. A linked list does not have to be implemented with pointers only. What is the other implementation of a linked list? Explain.
5. What is a binary tree? Discuss the tree traversal approaches?
6. Write short notes on :
a) Garbage Collection.
b) Recursion.
7. Write down the algorithm to sort a list using selection sort. Discuss its complexity. $(7,3)$
