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. (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)