Roll No. .....

Total No. of Questions : 07] [Total No. of Pages : 02

BCA (Sem. - 2nd)

DATA STRUCTURES

SUBJECT CODE : BC - 204(N2)

Paper ID : [B0208]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.

Section - A

Q1) *(10 × 2 = 20)*

a) What is the advantage of using doubly linked list?

b) What do you understand by a generalized list?

c) What is the need of garbage memory collection in case of dynamic memory allocations?

d) What is the shortcoming of binary search tree?

e) What do you understand by the time and space complexity of any algorithm?

f) What is the complexity of selection sort?

g) What does a top pointer of stack denote?

h) What is the difference between sequential and linked representations?

i) To compute shortest distance from Chandigarh to Mumbai, which algorithm will be most suitable? The problem statement will be represented using which data structure?

j) State a few applications of stacks?

Section - B

(4 × 10 = 40)

Q2) What do you understand by time and space complexity of a program? What is the Big O notation?

Q3) Write a program to calculate Fibonacci series using Recursion? What are the two major requirements-for any program to be recursive?

Q4) Using manual transformation, write the following expressions received after conversions:

(a) * - ! PQRS (Convert to Infix)

(b) (P-Q) / R*S * F - R!S +D*G (Convert to Prefix)

(! Denotes Exponential Operator)

Q5) What are the various operations possible on a link list. Explain with the help of an algorithm.

Q6) Suppose a sequence of numbers is given like: 23, 17, 25, 81, 55, 13, 58, 44. How this numbers will be sorted in Insertion Sort. What will be the complexity of insertion sort for the above sequence?

Q7) What is a binary search tree? How is it represented in memory? Explain various application of BST.