31322

Bachelor in Computer Application (BCA)

3rd Semester (Regular)

Examination – December, 2019

DATA STRUCTURES - I

Paper : BCA202

Time : Three hours] *[Maximum Marks : 80*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting at least ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. (a) What do you mean by complexity of an algorithm ? $2 \times 8 = 16$

(b) What is the need of data structure ?

(c) What do you mean by Garbage collection ?

(d) Write any three limitations of array.

(e) Define Priority Queue

(f) What is Secursion ?

(g) Define complete binary tree

(h) Define diagraph

UNIT – I

2. (a) What do you mean by data structure ? Explain various categories of data structure. Also explain various operations of data structure. 10

(b) Write first pattern matching algorithm. 6

3. (a) Define string. Explain various string operations by taking suitable example 8

(b) Explain Second pattern matching algorithm by taking an example Also write its algorithm. 8

UNIT – II

4. (a) Define array Write algorithm to delete an element from a linear array 8

(b) Define header linked list. Write algorithm to insert an element in a header linked list. 8

5. (a) What do you mean by sparse array ? How can you store the sparse array in memory ? Explain by giving suitable example. 8

(b) Define two way linked list. Write algorithm to insert an node into two way linked list. 8

UNIT – III

6. What is a stack ? Describe any two applications of stack in detail by writing their algorithm and by taking examples. 16

7. (a) Define Queue. How Queues are stored in memory ? Write. 8

(b) Define circular queue. Write algorithm to insert an element in a circular Queue. 8

UNIT – IV

8. What do you mean by tree traversal ? Write algorithm of postorder traversal using stack. Also explain it by taking suitable example. 16

9. (a) Define graph. Explain two methods of storing graph in computer memory by giving suitable example. 8

(b) Explain linked list representation of a binary tree in memory by taking suitable example. 8