(T-266)

Roll No. .....

ID—180-CU-304021

B.C.A. EXAMINATION, 2023

(Third Semester)

DATA STRUCTURES-1

Code : BCA-202

Time : 3 Hours *Maximum Marks : 80*

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

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) Define Data Structure.
   (b) What is Big 'O' notation ?
   (c) What is sparse array ?
   (d) Write *two* applications of Linked List.
   (e) Define Front and Rear in Queue.
   (f) Name stack operations.
   (g) Define Binary Tree.
   (h) Define Vertex and Edge in Graph. **8×2=16**

Unit I

2. (a) Explain Time-Space trade-off with example.
   (b) Write various operations in Data Structures. **2×8=16**

3. Explain various pattern matching algorithms. 16

Unit II

4. (a) Write an algorithm to delete element from Linked List.

   (b) What is threaded list ? How is garbage collection carried out in data structures ? 2×8=16

5. (a) Write an algorithm to traverse all elements in an array.

   (b) Write an algorithm for Binary Search. 2×8=16

Unit III

6. (a) How is Linked List represented in memory ?

   (b) What is Recursion ? Explain with example. 2×8=16

7. Write notes on the following : 2×8=16

   (a) Deques

   (b) Priority Queue.

Unit IV

8. Write various tree traversal algorithms. 16

9. Write notes on the following : 2×8=16

   (a) Breadth First Search Algorithm

   (b) Hashing.