

(T-266)

Roll No.

ID—180-CU-304021

B.C.A. EXAMINATION, 2023

(Third Semester)

DATA STRUCTURES-1

Code : BC11-202

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.
3. Explain various pattern matching algorithms.

2×8=16

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 ? $2 \times 8 = 16$
5. (a) Write an algorithm to traverse all elements in an array.
- (b) Write an algorithm for Binary Search. $2 \times 8 = 16$

Unit III

6. (a) How is Linked List represented in memory ?
- (b) What is Recursion ? Explain with example. $2 \times 8 = 16$
7. Write notes on the following : $2 \times 8 = 16$
- (a) Deques
- (b) Priority Queue.

Unit IV

8. Write various tree traversal algorithms. 16
9. Write notes on the following : $2 \times 8 = 16$
- (a) Breadth First Search Algorithm
- (b) Hashing.