

PAPER ID—10141

B.Sc. EXAMINATION, 2023

(Fourth Semester)

DATA STRUCTURE WITH C/C++

Time : 3 Hours

Maximum Marks : 40

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.

1. (i) List four operations of data structure. 2
- (ii) What is spanning tree ? 2
- (iii) Define advantage of using header linked list over simple link list. 2

- (iv) Comment on the need of a priority queue. 2

Unit I

2. What do you understand by complexity of algorithms ? How can you find complexity of algorithm ? Explain with suitable examples. 8
3. Write notes on the following : 8
 - (i)● Array Operations
 - (ii) Multi-dimensional array
 - (iii)● Sparse array
 - (iv) Representation of stacks as an array.

Unit II

4. Define Queue. What are the various operations of a queue ? Write a routine to insert an element onto a queue. 8
5. Distinguish between stack and queue. How the queue is implemented by linked list ? 8

Unit III

6. Construct the binary search tree using following elements :

35, 15, 40, 7, 10, 100, 28, 82, 53, 25, 3

Show diagrammatically each step of construction of BST. 8

7. What is binary tree ? Explain various traversal methods on a binary tree using suitable examples. 8

Unit IV

8. Define Sorting. Explain the different types of sorting techniques with a suitable example. 8
9. What do you mean by Graph ? How to find shortest path from source to all vertices using Dijkstra's algorithm. Explain in detail. 8