

**BACHELOR OF TECHNOLOGY (CBCS - 2023)**  
**B. Tech. Sem-II Computer Science & Business Systems : WINTER: 2025**  
**SUBJECT: DATA STRUCTURES & ALGORITHMS**

Day : Wednesday  
Date : 26/11/2025

**W-27709-2025**

Time : 10:00 AM-01:00 PM  
Max. Marks : 60

**N.B.**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary.

**Q.1** Define algorithm. Discuss the key characteristics of algorithms. (10)

**OR**

Describe asymptotic notations with examples.

**Q.2** Define Linear Data Structure. List down the different Linear Data Structure. (10)  
Explain anyone with the help of an example.

**OR**

Differentiate between stack and queue.

**Q.3** Create a B+ tree of the Order 4 for the given elements 1, 4, 7, 10, 17, 21, (10)  
31, 25, 19, 20, 28, 42.

**OR**

Define Non Linear Data Structure. Discuss its types with a suitable example.

**Q.4** Define shortest path and discuss Dijkstra algorithm with example. (10)

**OR**

Define minimum spanning tree and discuss minimum spanning tree algorithms.

**Q.5** Define and discuss sequential search with example. (10)

**OR**

Define DFS and discuss DFS operations with help of stack data structure.

**Q.6** Use a suitable example to explain the working of indexed access. (10)

**OR**

Explain the concept of hashing and how it can be used for fast key-based access in hashed file organization.

\* \* \* \*