Study Material Practical-7:

What is a Queue?

A **Queue** is a linear data structure that follows:

FIFO – First In First Out

Meaning:

- The first inserted element is the first to be removed.

Example:
If we insert → 10, 20, 30
Then remove → 10 will be removed first.

Just like:

- Railway ticket counter
- Printer queue
- Call center waiting line

Basic Terminology

Term	Meaning
Front	First element of queue
Rear	Last element of queue
Enqueue	Insert operation
Dequeue	Delete operation
Overflow	When queue is full
Underflow	When queue is empty

Types of Queue

1. Linear Queue
2. Circular Queue
3. Priority Queue
4. Deque (Double Ended Queue)

5️⃣ Time & Space Complexity

Operation	Time Complexity
Enqueue	O(1)
Dequeue	O(1)
Peek	O(1)
Display	O(n)

Space Complexity = O(n)

6️⃣ Applications of Queue

🔥 Very important for exams

- CPU Scheduling
- Printer Spooling
- Breadth First Search (BFS)
- Interrupt Handling
- Call Center Systems
- Order Processing Systems

7️⃣ Difference: Queue vs Stack

Feature	Queue	Stack
Principle	FIFO	LIFO
Insert	Rear	Top
Delete	Front	Top
Real Example	Ticket counter	Plate stack

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