DATA STRUCTURES

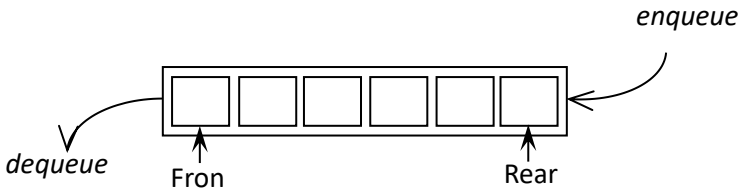
UNIT 2

2 - MARKS

1. Define Queue?

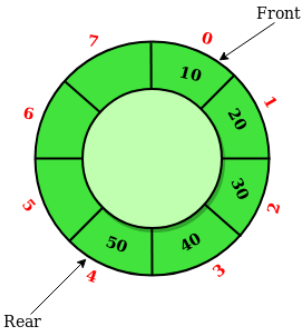
Queue is an ordered collection of elements in which insertions are restricted to one end called the rear end and deletions are restricted to the other end called the front end. Queues are also referred as First-In-First-Out (FIFO).

e.g : Ticket counter in a railway station.



2. What is Circular Queue?

- Circular Queue is a linear data structure in which the operations are performed based on FIFO (First In First Out) principle.
- The last position is connected back to the first position to make a circle.
- Elements are stored in clockwise direction.
- Circular Queue is used in memory management and scheduling process.
- It is also called 'Ring Buffer'.



3. What are priority queues?

A priority queue is a collection of elements such that each element has been assigned a priority.

Insert - inserts an element at the end of the list called the rear.

Delete Min - Finds, returns and removes the minimum element in the priority Queue.

4. What are the types of priority queues?

Ascending Priority Queue

Descending Priority Queue

5. What is an ascending priority queue?

It is a collection of items into which items can be inserted arbitrarily and from which the smallest item can be removed.

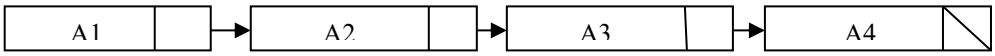
6. What is a descending priority queue?

It is a collection of items into which items can be inserted arbitrarily and from which the largest item can be removed.

7. Define Linked List?

Linked List consists of a series of structures, which are not necessarily adjacent in memory. Each structure contains the element and a pointer to a structure containing its successor. We call this the Next Pointer.

The last cell's Next pointer points to NULL.



8. Define Deque? Give the types of double ended queue.

The Deque is a short form of Double ended queue and defines a data structure in which items can be added or deleted at either the front or rear end, but no changes can be a made elsewhere in the list. Thus, a Deque is a generalization of both a stack and a queue.

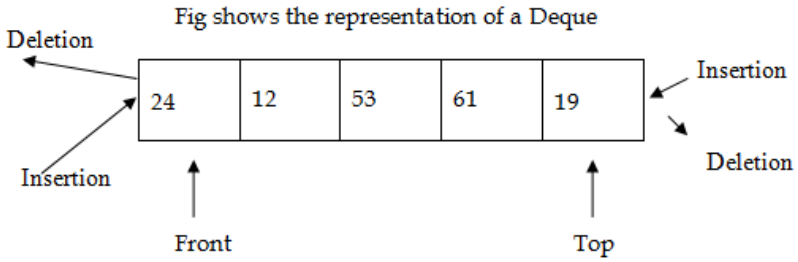


Fig shows the representation of a Deque

There are two variations of a Deque. These are:

1) Input – Restricted Deque
2) Output – Restricted Deque

9. What is Input – Restricted Deque?

An input restricted Deque restricts the insertion of elements at one end only, but the deletion of elements can be done at both the ends of a Deque.

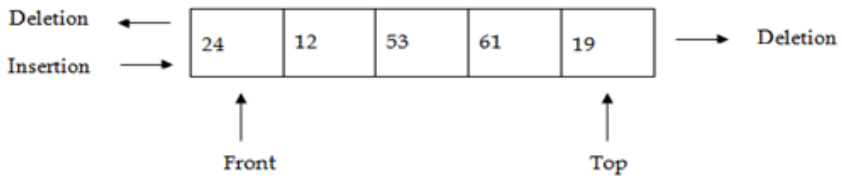


Fig shows the representation of input – Restricted Deque

10. What is Output – Restricted Deque?

An output restricted Deque restricts the deletion of elements at one end only, but the insertion of elements can be done at both the ends of a Deque.

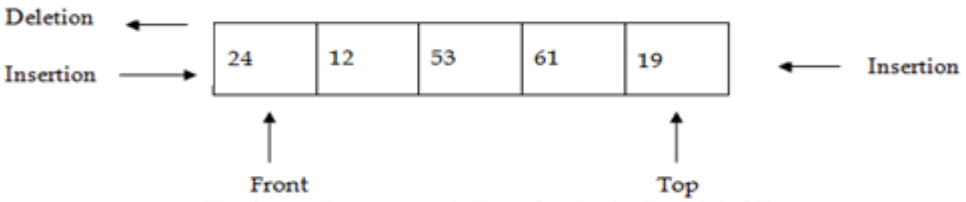


Fig shows the representation of output – Restricted Deque

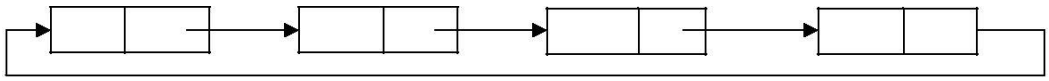
11. List all the basic operations carried out in a linked list?

The basic operations carried out in a linked list include:

a. Creation of a list
b. Insertion of a node
c. Deletion of a node
d. Modification of a node
e. Traversal of the list

12. Define circular linked list?

Circularly linked list is a collection of nodes, where each node is a structure containing the element and a pointer to a structure containing its successor. The pointer field of the last node points to the address of the first node. Thus, the linked list becomes circular.



4 - MARKS

13. Differentiate stack and queue?

#	STACK	QUEUE
1	Objects are inserted and removed at the same end.	Objects are inserted and removed from different ends.
2	In stacks only one pointer is used. It points to the top of the stack.	In queues, two different pointers are used for front and rear ends.
3	In stacks, the last inserted object is first to come out.	In queues, the object inserted first is first deleted.
4	Stacks follow Last In First Out (LIFO) order.	Queues following First In First Out (FIFO) order.
5	Stack operations are called push and pop.	Queue operations are called enqueue and dequeue.
6	Stacks are visualized as vertical collections.	Queues are visualized as horizontal collections.