1. What is the Collection framework in Java?

   It includes a set of interfaces, classes, and algorithms to work with different types of data structures like lists, sets, queues, maps, etc.

   Interfaces: List, Set, Queue, Map, etc.
   Classes: ArrayList, LinkedList, HashSet, TreeSet, HashMap, etc.

2. What is the difference between ArrayList and LinkedList?

   ArrayList :
   - Uses a dynamic array internally.
   - Elements will be accessed in O(1) time complexity.
   - Insertion/Deletion takes O(n) time complexity as it shifts the elements during this process.

   LinkedList :
   - Uses a doubly linked list internally.
   - Elements will be accessed in O(n) time complexity.
   - Insertion/deletion happens in O(1) time complexity.

3. What is the difference between Iterator and ListIterator?

   Iterator :
   - Supports forward traversal only.
   - Works with any collection.
   - Cannot replace an element.
   - It is limited to methods like next(), hasNext(), and remove().

   ListIterator :
   - Supports both forward and backward traversal.
   - Works only with List
   - Can replace elements using set().
   - It includes additional methods like previous(), hasPrevious(), and set().

4. What is the difference between Iterator and Enumeration?

   Iterator :
   - It is preferred for modern collections.
   - It can remove elements from the collection.

- It includes methods like hasNext(), next(), remove().

Enumeration :

- Used with legacy classes like Vector and Hashtable
- Cannot remove elements.
- It includes methods like hasMoreElements(), nextElement().

5. What is the difference between List and Set?

List :

- It allows duplicate elements.
- It maintains insertion order.
- It includes ArrayList, LinkedList, Vector.

Set :

- It does not allow duplicate elements.
- It usually does not guarantee order (except LinkedHashSet)
- It includes HashSet, TreeSet, LinkedHashSet.

6. What is the difference between HashSet and TreeSet?

HashSet :

- Both are sets but it does not maintain order.
- Insertion/deletion is faster (O(1) -> time and O(n) in the worst case)
- Allows one null element.

TreeSet :

- Maintains elements in sorted order.
- Insertion deletion takes O(logn) time
- Does not allow null

7. What is the difference between Array and ArrayList?

Array :

- Fixed size
- Can store both primitive types and objects.
- Better performance for simple and static data.
- Not type-safe (no generics).

ArrayList :

- Dynamic size (can grow and shrink).

- Can only store objects
- Slightly slower due to resizing operations
- Provides utility methods (add(), remove(), etc.).
- Supports generics, ensuring type safety.