Core Java Interview Questions and Answers

1.What is java?
Java is a simple and most widely used programing language.
Java is fast,reliable and secure

2.Why do we go for java?
Freeware and opensource
It is platform independent i.e program written in one operating system is capable of running in all other operating systems due to bytecode concept.
It runs multiple application at a time.

3.What are the main features of java?
*Java has more features,
1. Platform independent
2. Open source
3. Multithreading
4. More secure
5. Portable

4.What is platform independent?
During the compilation the java program is converted into byte code(not machine specific).
Bytecode can be runned by jvm of any platform.
So code developed in one platform is capable of running in all other platform.

5.What is meant by Open Source?
A program in which source code is available to the general public for use and/or modification from its original design at free of cost is called open source.

6.What are IDE/tools availabe in market for java?
Notepad
Netbeans
Eclipse
JDeveloper(oracle)
RAD(IBM)

7.What are difference between JDK,JVM,JRE?
JDK:

Java Development Kit.
If we want to create any applications in java JDK have to be installed in our system.
JDK versions: 1.0 to 1.15.

JRE:

Java Runtime Environment.
It is a pre-defined class files (i.e.) library files.

JVM:

Java Virtual Machine.
It is mainly used to allocate the memory and compiling.

8.What is oops?
OOPS is Object Oriented Programming Structure.
OOPS is a method of implementation in which programs are organised as collection of objects, class and methods.

9.What are the coding Standards used in java?
Pascal notation: Every word's first letter ,must be a capital letter
Example:GreensTechnology
Camel notation: First word's first letter should be a small letter, all the other succeeding word's first letter should be a capital letter.
Example:greensTechnology

10.What is class,method,object?
Class:

Class is a collection of objects and methods
Class contains attributes(variables and methods) that are common to all the objects created in a class.
Method:

Method defines the set of actions to be performed.

Object:

Object is the run time memory allocation.
Using object we call any methods.

11.What is mean by Encapsulation?
It is the structure of creating folders.
It wraps the data and code acting on data together in to a single unit.
Example of encapsulation is POJO class.
It is otherwise called Data hiding.

12.What are the datatypes used in java?
byte
short
int
long
float
double
boolean
char
String

13.What is byte size and range of int datatypes?
Size of byte is 1 byte (8 bit)
Range formula =[-2^(n-1)] to [(2^(n-1))-1] for int n=32

14.What is mean by Wrapper class?
Classes of data types is called wrapper class.
It is used to convert any data type into an object.
All classes and wrapper classes default value is null.

15.What is the main use of Scanner class?
To get the inputs from the user at the run time.

16.What are the methods available in Scanner Class?
nextByte();
nextShort();
nextInt();
nextLong();
nextFloat();
nextDouble();
next().charAt(0);
next();
nextLine();
nextBoolean();

17.What is mean by inheritance?
Accessing one class Properties in another class without multiple object creation.
It avoids time and memory wastage.
It ensures code reusability..

18.What are the ways to access the methods /data from another class?
We can access the another class methods either by creating object or using extends keyword.

19.What is mean by polymorphism?
Poly-many.
Morphism-forms.

Taking more than one forms is called polymorphism or one task implemented in many ways.

20.What are the difference between method overloading and overriding?
Method overloading(static binding/compile time polymorphism/early binding):

When we have multiple methods with same method name but differs only on arguments based on its datatype,datatype count and order.

Class-name
Method-same
Argument-differ based on datatype,order,number
Method overriding(dynamic binding/run time polymorphism/Lateral Binding):

When you are not satisfied with the logic of your super class method,you can create the same method(with exact same
method name) in your sub-class and you can write your required business logic.When you create object for sub-class,sub class
method only will get executed.so here child class method overriding parent class method.

Class name-differ(using extends)
Method-same
Argument-same

21.What are the types of inheritance?
Single Inheritance
Multilevel Inheritance
Multiple Inheritance
Hybrid Inheritance
Hierarchical Inheritance

22.Why multiple inheritance is not supported in java?
Compilation error/syntax error-After extends keyword we can mention only one classname(, not allowed)
Priority problem-When multiple parent classes has methods with same name and arguments,compiler will not know
which method should be called.

23.What are the difference between Multiple and Multilevel inheritance?
Multiple inheritance:

More than one parent class directly supporting into same child class parallely.
Multiple inheritance not supported in java due to Compilation problem and priority problem
We can achieve multiple inheritance in java through interface.

Multilevel inheritance:

More than one parent class supporting into one child class in tree level structure.
It is supported in java...

24.What is mean by access specifier?
It defines the scope or level of access for variables,methods and classes.

25.What are the difference between public and protected?
Public:

It is global level access(same package + different package).
Protected:
---
can access Inside package (object creation + extends)

26.What is mean by Abstraction?
Hiding the implementation part or business logic is called abstraction.

27.What are the types of Abstraction?
1. Partially abstraction(using abstract class).
2. Fully abstraction(using interface).

28.Can we create Object for Abstract class?
No, we cant create object for abstract class.

29.What is mean by Interface?
An interface in Java is a blueprint of a class. It has static constants and abstract methods.

The interface in Java is a mechanism to achieve abstraction. There can be only abstract methods(no business logic) in the Java interface, not method body. It is used to achieve abstraction and multiple inheritance in Java.

In interface "public abstract" is default.
using "implements" keyword we can implement the interface in a class where we can write the business logic for all
unimplemented methods.

30.What are the difference between Abstract and Interface?
Abstract class:

Using Abstract class,we can acheive partial abstraction.
It support both abstract method and non-abstract method.
using "extends" keyword you can inherit an abstract class.
For any abstract method we need to mention "public abstract".
Interface:

Using interface,we can acheive full abstraction.
It supports only abstract method.
It is using "implements" keyword.
"public Abstract" is default, no need to mention it explicitly.

31.What is meant by String?
Collection of characters or words enclosed within double quotes is called as String.
String is a class in java
String is index based
Example : "greenstechnology".

32.What are the method available in string?
equals();
equalsignorecase();
contains();
split();
toUpperCase();
toLowerCase();
subString();
isEmpty();
identifyHashCode();
startsWith();
endsWith();
CompareTo();
charAt();
indexOf();
lastIndexOf();
replace();

33.What is mean by constructor?
A Constructor is a block of code that intialize an object whenever it is created(implicit call.
constructor name must be same as the class name.
It doesn't have any return type.
It supports method overloading but won't support method overriding.
purpose of constructor:It is used to initialise the values to variables.

34.Explain the types of constructor?
Parameterized constructor - A parameterized constructor is where we can pass arguments/parameters.
Non parameterized constructor - Also called Default constructor. This is present as a default in every class where it doesn't have any parameters and has a default value of null, 0 when an object is invoked.

35.Do constructors have any return type?
No,constructor can't have any return type.

36.Write a syntax for creating constructor?
Access specifier classname(){

}

37.What are the rules for defining a constructor?
Class name and constructor name must be same.
It should not have any return type.
A java constructor can not be abstract, static, final and synchronized.

38.Why a return type is not allowed for constructor?
constructor is not directly called by your code, its called by memory allocation and object initialisation in the run time.
Its return value is opaque to the user so we can't mention it.

39.Can we declare constructor as 'private'?
Yes,we can declare constructor as private.

40.Why a compiler given constructor is called as default constructor?
If we didnt create a constructor explictly it will take the default constructor.

41.What is constructor chaining and how can it be achieved in Java?
The process of calling one constructor from another constructor with respect to current object is called constructor chaining.
By using this() and super() keywords we can achieve constructor chaining.

42.What are the difference between this() and super()?
this keyword is used to call class level constructor, i.e in the same class.
super keyword is used to call the parent class constructor.

43.What is the super class of all java?
Object is the super class of all classes in java.

44.What are the types of variable?
Local level variable.
Global/Class level variable.
Static variable.
Final variable....

45.What is meant by local variable,instance variable,class/static variable?
Static Variable-It is shared by all the objects in the class.
Local Variable-A variable declared inside a method/block.Level of access:only inside the block
Class variable-A variable declared outside all methods but inside class. Level of access is only with in object.....

46.What is mean by static keyword in java?
The static keyword is mainly used for memory management.
It is used to share the same variable or method by objects of given class.

47.Can we override static method in java?
No,we can't override the static method because it is part of a class rather than an object.

48.Can we overload static method in java?
Yes, we can overload the static method in java.

49.What is meant by static variable?
When a variable is declared as static,then a single copy of variable is created and shared among all object at class level.
Static variable is essentially a global variable.
All the instance of the class share the same static variable.

50.What is meant by static method?
When a method is declared as static,we need not create object to call the paticular method.We can call as Classname.methodname()
Static method in java belong to the class(not to an object).
They use no instance variables and will usually take the input from the parameters and perform action on it,then return some result.

51.What is meant by final keyword and what's happend when we declare final as in class,method,variable?
Final is a non access modifier applicable to a variable, method or a class.
When a variable is declared with final keyword,its value can't be modified.
When a method is declared as final we can prevent method overriding.
When a class is declared as final we can prevent inheritance.

52.What is the difference between final and finally keyword?

Final:

Final varaible can't be modified.
Final method can't be overrided.
Final class can't be inherited.

Finally:

Code given inside finally block will always get executed whether exception occurs or not.
53.Where are local, static and class variables stores in jvm?
Static variables are stored in the permGen section of heap memory.
Local variables are stored in stack.

Class variables are stored in heap memory.

54.What is an Exception?
Exception is an unexpected event which when occurs in a program,your program will terminate abnormally.
We can avoid this abnormal termination using exception handling mechanisms(try,catch,finally,throw,throws)

55.Explain about the types of Expection?
Unchecked exception(Run time exception)
Checked exception(Compile time exception)

56.What are the difference between checked expection and unchecked expection?

Unchecked exception:

It will occur at the Run time.
Checked exception:

Checked exception will occur at the Compile time.

57.What is the super class for Exception and Error?
Throwable
Exception

58.Can we have try block without catch block?
Yes we can have try block without catch block.But in that case finally block must be present.(There will be no syntax error)
Possible but we will not able to handle the exception without catch block.

59.Can we write multiple catch blocks under single try block?
Yes,we write multiple catch blocks under single try block.

60.How to write user defined exception or custom exception in java?
First customised exception must come under Exception class.

```
access_specifier method_name() throws customException {
throw new customException();
}
```

61.What are the different ways to print exception message on console?
ref.printStackTrace() method is used to print the exception message in the console.

62.What are the differences between final finally and finalize in java?

Final:

A final class variable whose value cannot be changed.
A final method is declared in class level, they cannot be inherited.
A class declared as final can't be inherited.
Finally:

It's a block of statement that definitely executes after the try catch block.
Exception occurs or not, finally block always get executed.
Finalize:

It will clean up unused memory space.

63.What are the differences between throw and throws?

Throw	**Throws**
Throw is a keyword used explicitly to throw an exception	Throws keyword is used to declare an exception
Checked Exceptions can not be propagated using Throw only	Checked Exceptions can be propagated using Throws
Throw is followed by an instance	Throws is followed by a class
Throw is used within the method	Throws is used in the method signature
We can only throw one exception	Multiple exceptions can be declared using throws Eg: Public void method()throws IO exception,SQL Exception

64.Explain Java Exception Hierarchy?

Exception

Unchecked Exception(Run time exception)	**Checked exception(Compile time exception)**
ArithmeticException	IOException
NullPointerException	SQLException
InputMismatchException	FileNotFoundException
ArrayIndexOutOfBoundException	ClassNotFoundException
StringIndexOutOfBoundException	
IndexOutOfBoundException	
NumberFormatException	

65.What is meant by throw and throws?
Throw is a keyword used to explicitly throw an exception
Throws is a keyword, it is used to handle the exceptions(in method level).

66.What is meant by array?
Storing multiple values of similar datatype in a single variable.
In Array, the elements can be accessed randomly using the index number.

67.What are the advantages and disadvantages of array?
Advantage:

In a single variable we can store multiple values.
Easier to access data using the index number and easier to manipulate the data
Disadvantages:

It support only similar data types.
Size fixed at compile time.
Memory wastage is high.

68.Different ways to initialize an array?
Arrays can be initialized using different ways.

1. Initialising without assigning any values:
   Datatype refName[]= new Datatype[size];

```
class HelloWorld {
   public static void main( String args[] ) {
      //Initializing array
      int[] array = new int[5];
      //Printing the elements of array
      for (int i =0;i < 5;i++)
      {
         System.out.println(array[i]);
      }
   }
}
```

2. **Initialising an array after a declaration:**
   Datatype[] array;
   Array= newDataType[]{values};

```
class HelloWorld {
   public static void main( String args[] ) {
      //Array Declaration
      int[] array;
      //Array Initialization
      array = new int[]{1,2,3,4,5};
      //Printing the elements of array
```

```
      for (int i =0;i < 5;i++)
      {
         System.out.println(array[i]);
      }
   }
}
```

3. Initialising and assigning values:
   Datatype[]={value1, value2, value 3…};

```
class HelloWorld {
   public static void main( String args[] ) {
      int[] array = {11,12,13,14,15};
      //Printing the elements of array
      for (int i =0;i < 5;i++)
      {
         System.out.println(array[i]);
      }
   }
}
```

69.Can we change the memory size of array after initialization?
No,we can't change the memory size of array after initialization.

70.What is collection ?

Collection Framework is a combination of classes and interface, which is used to store and manipulate the data in the form of objects. It provides various classes such as ArrayList, Vector, Stack, and HashSet, etc. and interfaces such as List, Queue, Set, etc. for this purpose.

It will support storage of multiple values with dissimilar data types.
It is dynamic memory allocation.
No memory wastage like array.

71.What is the difference between ArrayList and Vector?

ArrayList	**Vector**
ArrayList is not synchronized i.e. executed parallel	Vector is Synchronous (executed one by one)
Not Thread safe	Vector is thread safe
Arraylist is not a legacy class	Vector is a legacy class
ArrayList increases its size by 50% of the Array size	Vector increase its size by doubling the Array size

72.What is the difference between ArrayList and LinkedList?

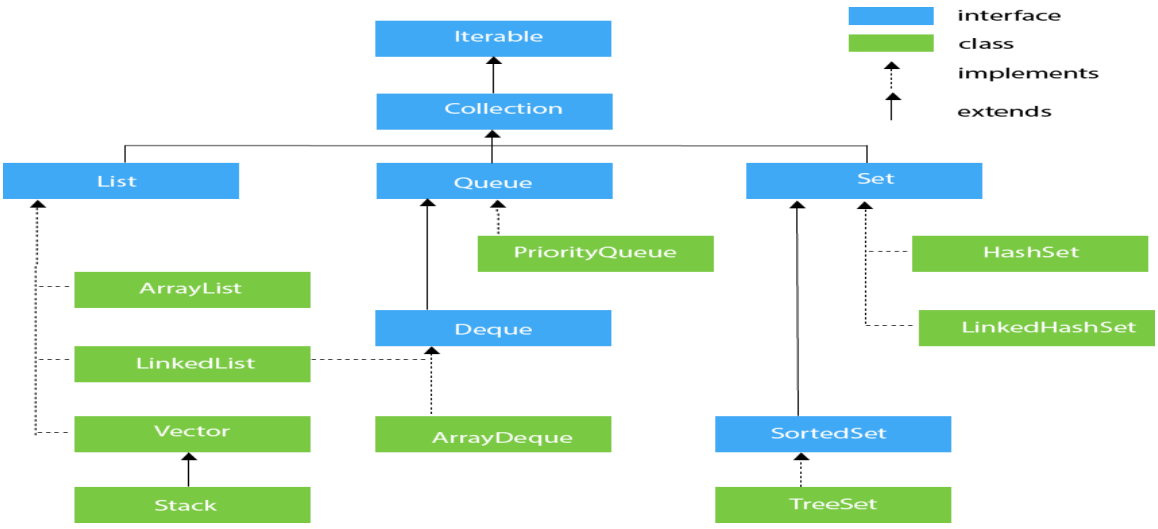
LinkedList:

Insertion and deletion is a best one.
Searching/retrieving is a worst.
It makes performance issue.
ArrayList:

In Arraylist retrieve/searching is a best one
In ArrayList deletion and insertion is a worst one because if we delete/insert one index value after all the index move to forward/backward.
It makes performance issue.

73.Difference between Collection and Collections
Collection-Collection is an interface under which we have list,set,queue
Collections-is an utility class in which we have lots of predefined methods which we can apply over collection objects.
Eg:Collections.min(),Collections.max(),Collections.sort()

74.Describe the Collection type hierarchy ? What are the main interfaces ?



75.What is difference between set and List?
Set:

It is a value based one.
It prints in random order.
It won't allow duplicates.

List:

It is a Index based one.
It prints in insertion order.
It allow duplicates.

76.What is the difference between HashSet and TreeSet ?

Hash set is implemented using HashTable	The tree set is implemented using a tree structure.
HashSet allows a null object	The tree set does not allow the null object. It throws the null pointer exception.
Hash set use equals method to compare two objects	Tree set use compare method for comparing two objects.
Hash set doesn't now allow a heterogeneous object	Tree set allows a heterogeneous object
HashSet does not maintain any order	TreeSet maintains an object in sorted order

HashSet:

It prints in random order.
TreeSet:

Treeset prints in ascending order

77.How to convert List into Set?
By addAll() we can convert List into set.(all the elements in list will get added to set)

78.What is map?
A map is an interface that is present in java.util package. It is used to represent the mapping between key and value.
Here key+value is one entry.
Key ignore the duplicate value and value allow the duplicates.

79.What is difference between Hash Map and Hash Table?

HashMap	Hashtable
1) HashMap is **non synchronized**. It is not-thread safe and can't be shared between many threads without proper synchronization code.	Hashtable is **synchronized**. It is thread-safe and can be shared with many threads.
2) HashMap **allows one null key and multiple null values**.	Hashtable **doesn't allow any null key or value**.
3) HashMap is a **new class introduced in JDK 1.2**.	Hashtable is a **legacy class**.
4) HashMap is **fast**.	Hashtable is **slow**.
5) We can make the HashMap as synchronized by calling this code Map m = Collections.synchronizedMap(hashMap);	Hashtable is internally synchronized and can't be unsynchronized.
6) HashMap is **traversed by Iterator**.	Hashtable is **traversed by Enumerator and Iterator**.
7) Iterator in HashMap is **fail-fast**.	Enumerator in Hashtable is **not fail-fast**.
8) HashMap inherits **AbstractMap** class.	Hashtable inherits **Dictionary** class.

80.What is difference between set and Map?

Set:

It is a value based one.
It print in random order.
It won't allow duplicates.

Map:

It is key and value pair.
Here key+value is one entry.
Key ignore the duplicate value and value allow the duplicates.

81.Can we iterate the list using normal for loop?
Yes,we can iterate the list using both normal and enhanced for loop.

82.What are the methods available in list But not in set?
indexOf();
get();
lastIndexOf();

83.Explain about user defined Map?
It is key and value pair.
Here key+value is one entry.
Key ignore the duplicate value and value allow the duplicates
Syntax:
Map<String,String> map=new HashMap<String,String>();

84.How much null allows in below maps:
HashMap :k?,v?
LinkedHashMap:k?,v?
TreeMap :k?,v?
HashTable :k?,v?
HashMap :k-1 null,v- n null
LinkedHashMap:k-1 null,v- n null
TreeMap :k-ignore null,v- allow null
HashTable :k-ignore null,v- ignore null

85.How to Iterate Map?

1. **Iterating** over entries using For-Each loop.
2. **Iterating** over keys or values using keySet() and values() **method** using for-each loop.
3. **Iterating** using stream() in **JAVA** 8.
4. Using entrySet()
5. Using **Iterator** through a **Maps**.

86.What is the return type of entrySet?
Set<Entry<key,value>>

87.Write the methods to get the key only and value only?
For key only keySet() method is used.
For value only values() method is used.

88.What is mean by File? In which package it is available?
File is a class and it is used to achieve the file operation.
It is available in java.io package.

89.What are the methods available in File ?
mkdir();
mkdirs();
list();
createNewFile();
isDirectory();
isFile();
isHidden();

90.While creating a file if we do not mention the format then under which format will it save the file?
If we do not mention the file format it will automatically take format as file.

91.What are the differences between append and updating the file?

For updating the file:

It will replace the old contents of the file.

For appending the file:

It will add the contents at the end of the file.

92.What is meant by Enumerator, Iterator and List Iterator?

Enumeration:

It is an interface used to iterate only legacy class or interface.
Only iterates in forward direction
Iterator:

It is an interface used to iterate the collection objects
Only iterates in forward direction
List Iterator:

It is an interface used for iterating list type classes
iterates in forward as well as backward direction

93.Difference between Enumurator,Iterator and List Iterator?

Property	**Enumeration**	**Iterator**	ListIterator

1. Where we can apply?	It can be applied only to the legacy classes.	It can be applied to any collection interface.	It can be applied to the only list interface.
2. Is it a legacy?	Yes (introduced in 1.0 V).	No (introduced in 1.2 V).	No (introduced in 1.2 V).
3. Allowed Movement	Single direction, i.e we can traverse elements present in the collection only in the forward direction.	Single direction, i.e we can traverse elements present in the collection only in the forward direction.	Bidirectional, i.e we can traverse elements present in the collection both in forward and backward directions.
4. Allowed Operation	We can only perform the read operation.	We can perform read and remove operation.	We can perform read, remove, add, and replace operations.
5. How can we get it?	By calling elements() method present in the vector class.	By calling iterator() method present in any collection interface.	By calling listIterator() method present in the list interface.

94.What are the methods available in Enumerator, Iterator and List Iterator?

Enumerator Methods:
---

hasMoreElements();
nextElement();

Iterator Methods:
---

hasNext();
next();
remove();

ListIterator Methods:

---

hasNext();
next();
remove();
hasPrevious();
previous();

95.Explain JDBC connection steps?
Import JDBC packages.
Load and register the JDBC driver.
Open a connection to the database.
Create a statement object to perform a query.
Execute the statement object and return a query resultset.
Process the resultset.
Close the resultset and statement objects.
Close the connection.

96.What are control statements?
Statement which has control over the loop or program is called control statements.
Example:if,if else,for,while,dowhile etc

97.Different control statements available in java

Break:

It is used to terminate the loop

Continue:

It is used to skip the current iteration.
while and do while

While:

It is entry check loop.
Do While:

It is a exit check loop.
if and if else
==========

if
--

executes only when the condition becomes true.

if else
---

executes the else part when the condition becomes false and executes if part when condition becomes true.

99.Difference between Remove all() and Retain all
Remove all() and Retain all
==========

removeAll():
---

removeAll() is a method , it is used to compare the 2 lists and remove all the common values
retainAll():
---

retainAll() is a method, it is used to compare both lists and retains only the common values

100.Difference between Literal String and Non literal string
Literal String and Non literal string
==========

Literal String:

In case of String duplicates,it will share the same memory address
Its stored inside the heap memory(string pool or string constant).
It share the memory if same value (duplicate value)
Non literal string:

Even incase of String duplicates,it will have different memory address.
Itâ€™s stored in the heap memory.
Its create a new memory every time even if it is a duplicate value(same value)

101.Difference between Heap and stack memory
Heap and stack memory
==========
Heap memory:

Heap is used for dynamic memory allocation.
Memory access is slow.

Static memory:

Stack is used for static memory allocation.
Variables allocated on the stack are stored directly to the memory and access will be very fast.

102.What is the default Package in java?
java.lang

103.What are the difference between equals() & hashcode()?

equals:

Used to compare the two string.
Hashcode:

Used to return the address where it stored.

104.How can we make Array list As synchronized?
We can use collections.SynchronisedList(refName of array)method to synchronize arraylist in Java.

```
public class synchronizeArrayList{
 public static void main(string[]args){
//Non-synchronized array list
   List<String> language= new arrayList<String>();
     language.add("Java");
     language.add("python");
     language.add("SQL");
//synchronizing arraylist in java
    language=collections.synchronizedList(language);
//use synchronize block to avoid non-deterministic behaviour
     synchronized(language){
   Iterator<String>itr= language.iterator();
     While(itr.hasNext()){
     System.out.println(itr.hasNext());
}
}
}
}
```

String Interview Q&A

1. **What is String?**
   String is a sequence of characters that's stored in a character Array. It is a text that is enclosed in double quotes.
   String is a non- primitive data type, index based class in Java.
   Eg: "Hello" is a string that contains sequence of characters 'h' 'e''l''l''o' enclosed in double quotes.

2. **String is immutable in Java, why?**
   String is immutable in Java because whenever we declare any string it will be stored in the string pool constant where we can't change values in that particular memory.
   For eg; string s1 = "hello"
   String s2= "hello"
   String will identify the values are similar and will not create separate object for each values. However, if we concat the string
   s1.concat("java"), the reference variable s1 will still have value "hello" instead of "hello java".

3. **Difference between literal and non-literal string?**

Literal String	**Non-Literal String**
It stores data inside the heap memory(string pool constant)	It stores data in the heap memory
The syntax to declare literal string is String ref name = "value"	The syntax to declare non-literal string is String ref name = new String("value")
In case of duplicates, the data is stored in the same memory location	In case of duplicates, all the data will share a different memory location

4. **Difference between mutable and immutable string?**

Immutable String	**Mutable String**
It acts like a literal String where we can't change the value in memory location	It acts like a non-literal string where we can change the values in memory location
To join two strings we use concat method	To join two strings we use append. The first string and the appended string shares the same memory location.
All the strings gets stored in different memory location	String buffer or string builder class is used

5. **When there is a string class why we need to go for string buffer and string builder?**
   The objects of String class are immutable in nature, i.e. you can't modify them once they are created. If you try to modify them, a new object will be created with modified

content. This may cause memory and performance issues if you are performing lots of string modifications in your code. To overcome these issues, we use StringBuffer and StringBuilder classes.

6. Difference between string buffer and string builder?

String Buffer	String Builder
It is synchronized i.e. only one thread can enter an object at any point of time.	It is asynchronised i.e multiple threads can enter the object at any point of time.
It is Thread safe. Multiple threads can't enter the object simultaneously. One Thread has to wait until another thread has finished with them.	It is not Thread safe i.e. multiple thread can enter the object parallel. Threads don't have to wait until one thread is finished.
Because of the above reason String Buffer is slower	String builder is faster as a result of this.

7. What is String Constant pool?

String Constant Pool is the memory space in heap memory specially allocated to store the string objects created using string literals. In String Constant Pool, there will be no two string objects having the same content/value.

Whenever you create a string object using string literal, JVM first checks the content of the object to be created. If an object in the string constant pool has same content, then it returns the same reference of that object. It doesn't create a new object. If the content is different from the existing objects then only it creates new object.

8. Difference between Heap Memory and Stack Memory?

Heap Memory	Stack Memory
Heap is a memory used by programming languages to store global variables.	Stack is a special memory area where the temporary variables created by a function are stored.
Memory is allocated in random order	Memory is allocated in a long continuous block
Access speed is slower	High speed access
Memory allocation is done manually by the programmer	Memory allocation is done automatically by compiler instructions
Resizing of memory is possible	Memory size is fixed
Main issue is the memory fragmentation	Main issue is the shortage of memory

The cost is more	The cost is less

Collection – Interview Q&A

1. **Difference between Collection and Collections?**

Collection	**Collections**
Collection is an interface in java.util package	Collections is an utility class in java.util package
It is used to represent a group of individual objects as a single unit	It defines several utility methods that are used to operate on collection
It contains abstract and default methods. It has static methods from Java 8 onwards	It has only static methods
Add(), remove(), clear(), contains() and size() are the important methods in collection	Collections class sorts and synchronise the collection elements
Iterable is the super class of collection	

2. **Explain about collection Framework?**

   Collection Framework is a combination of classes and interface, which is used to store and manipulate the data in the form of objects. It provides various classes such as ArrayList, Vector, Stack, and HashSet, etc. and interfaces such as List, Queue, Set, etc. for this purpose.

3. **Why we need to go for collection when there is already Array concept?**
   In Array we can store only similar type of objects. Array size is fixed and cannot provide readymade methods for user requirements such as searching, sorting etc. Therefore we use collection where heterogenous or dissimilar objects can be stored. In collection the size can be changed dynamically as per the need and it also contains readymade methods.

4. **List the difference between List, Set and Map?**

List	**Set**	**Map**
List Interface is index based and it allows duplicate elements	Set interface is value based and it doesn't allow duplicate elements	Map interface has key value pair combination where key don't allow duplicate elements but values allow duplicates

List maintains insertion order	Set doesn't maintain insertion order	Map doesn't maintain insertion order
We can add any number of NULL values	Only one null value is allowed in Set	Map allows single Null key at most and n number of null values
List implementation classes are Array List, Linked List and Vector	Set implementation classes are Hashset, Linked Hashset and Treeset	Map implementation classes are HashMap, Linked HashMap, TreeMap, HashTable and Concurrent HashMap
List has get() method to get the element at specific index	Methods not supported in set are indexof, lastIndexof, get, set	
If we want to access the elements frequently by using Index, we can go for list	If we want to create a collection of unique elements, we can go for set	If we want to store the data in the key value pair combination, we can go for Map

5. Difference between Array and ArrayList?

Array	**ArrayList**
An Array is a dynamically created object. It stores multiple values of similar datatypes in a single variable name.	ArrayList is a class of Java collections framework. It contains classes like vector, HashTable and HashMap
Array is static in size	ArrayList is dynamic in size
It is a fixed length data structure	It is a variable length data structure
size of the Array should be provided before initializing it	We can create an instance of ArrayList without mentioning its size
It is faster due to fixed size	It is slower due to resizing internally
It stores both objects and primitive types	We can't store primitive types in ArrayList. The primitive type automatically converts to object
We can't use generics in Array because it is not a convertible type of array	Array List allows to store only generics/type
We use for loop and enhanced for loop to iterate Array	We use iterator to iterate over ArrayList
Array is multidimensional	ArrayList is always single dimensional

6. Difference between ArrayList and LinkedList?

ArrayList	**LinkedList**
ArrayList internally uses dynamic Array to store the elements	LinkedList internally uses doubly linked list to store elements
Insertion and deletion is difficult in ArrayList because if any element that is	Insertion and deletion is easy in LinkedList because it uses doubly

removed from the array, all the bits are shifted in memory.	linkedlist so no bit shifting is required in memory
Searching and retrieving is easy in ArrayList	Searching and retrieving is difficult in LinkedList
ArrayList provides random access	LinkedList doesn't provide random access
Arraylist takes less memory overhead as it stores only object	LinkedList takes more memory overhead as it stores object as well as its address
Arraylist is better for storing and accessing data	Linkedlist is better for manipulation of data

7. **Difference between ArrayList and Vector?**

ArrayList	**Vector**
ArrayList is not synchronized i.e. executed parallel	Vector is Synchronous (executed one by one)
Not Thread safe	Vector is thread safe
Arraylist is not a legacy class	Vector is a legacy class
ArrayList increases its size by 50% of the Array size	Vector increase its size by doubling the Array size

8. **What are the methods available in List that are not present in set?**
   The methods that are not present in set are add(index, value), indexof, lastIndexof, get, set.
9. **How to convert an Array into List?**
   1.Brute Force or Naive Method: In this method, an empty List is created and all elements present of the Array are added to it one by one.

   - Get the Array to be converted.
   - Create an empty List
   - Iterate through the items in the Array.
   - For each item, add it to the List
   - Return the formed List

   2. **Using Arrays.asList() method:** In this method, the Array is passed as the parameter into the List constructor with the help of Arrays.asList() method.

-Get the Array to be converted.
-Create the List by passing the Array as parameter in the constructor of the List with the help of Arrays.asList() method
-Return the formed List

3. Using Collections.addAll(): Since List is a part of the Collection package in Java. Therefore the Array can be converted into the List with the help of Collections.addAll() method.

Get the Array to be converted.
Create an empty List.

Add the array into the List by passing it as the parameter to the Collections.addAll() method. Return the formed List.

10. **Difference between normal and enhanced for-loop**?

Normal for-loop	**Enhanced for-loop**
This for-loop is present from JDK1	Enhanced for loop or for-each loop is present from JDK5
In a normal for-loop, we can increase the counter by using i=i+x(where x is any constant x=1,2,3…)	But enhanced for loop will execute in a sequential manner i.e counter will always increase by one.
Using this for loop we can iterate on any container object.	We can only iterate on that container by using this loop to implement the iterable interface.
In this for-loop, we can iterate in both decrement or increment order.	But in enhanced for-loop, we can iterate only in increment order.
In t for-loop, we can replace elements at any specific index.	But in enhanced for-loop, we don't have access to the index, so we cannot replace elements at any specific index.
By using normal for-loop we can print array elements either in the original order or in reverse order.	But in the for-each loop, we can print array element only in the original order, not in reverse order

11. Different type of List and its implementation order, types of set (order maintained by each set), types of Map (based on order of each map and null value acceptance)?

Types of List:
ArrayList
LinkedList
Vector
Set:
HashSet – random order
LinkedHashSet –insertion order
TreeSet – Ascending order

Map:
HashMap – random order – Key =1 null; Value = n null
Linked HashMap – Insertion order – key = 1 null; value = n null
TreeMap – Ascending order – key=ignore null; values= n null
Hashtable – Random order – key = ignore null; values = ignore null

12. Difference between add(index,element) and set(index,element)?

Add(index,element) – This method is used to insert the specified element in the specified position in the list
Set(index, element) – This method is used to replace the element in a specified position with a specified element.

13. What is the Return type of entryset(), keyset(),Values(),getKey(), getValue()?

Entryset() – set<Entry<>>
Keyset() – set
Values () – collection
getKey() – based on datatype
getValue() – based on the datatype

14. Difference between keyset() and entryset()?

Keyset()	**entrySet()**
keySet() method in Java is used to create a set out of the key elements contained in the hash map	entrySet() method in Java is used to create a set out of the same elements contained in the hash map
This method returns the Set view of all the keys present in the map, ie it returns a set of keys.	This method returns the Set view of all the mappings present in the map, ie it returns a set of key, value pairs.
When iterating through all pairs the performance is poorer compared to entryset()	When iterating on all pairs the performance is better than the keyset()
If there are any changes happened to the map it is observed in the set also	If there are any changes happened to the map it is observed in set also, in entrySet()

15. What is Generics?

Java Generics <> is a set of related methods or a set of similar types. Generics allow datatypes Integer, String, or even user-defined types to be passed as a parameter to classes, methods, or interfaces. Generics are mostly used by classes like HashSet or HashMap. Generics was added in jdk 1.5 version.
Advantages of Generics:

1. Code re-use
2. Compile time safety – invalid datatypes can be identified during compile time itself
3. Individual type-casting is not required
4. Allows to implement non-generic algorithm

16. What is Upcasting?

Upcasting is the process of accessing the method of parent class by creating an object for the child class. It is the typecasting of a child object to a parent object. Upcasting can be done implicitly.

17. What is downcasting?

Downcasting is the process of accessing the method of the child class by creating an object for the parent class. It is the typecasting of a parent object to a child object. Downcasting can not be implicit.

18. Explain List li= new ArrayList(); ?

List is the interface
li is the reference name
ArrayList() is a class where the data is stored

19. What is wrapper class?

A Wrapper class is a class whose objects wraps or contains primitive data types. It provides the mechanism for an object to be converted to a primitive datatype(Unboxing) or a primitive datatype to an object(autoboxing).
Eg: Byte, Integer, Short,Long, Float, Double,Character,Boolean