1) **What is java? Explain in features.**

Java is high level and object oriented language.
They have some key features

- Platform Independency :
  - write once run anywhere (WORA)
- Object oriented :
  - followed by oop principle like encapsulation, polymorphism, inheritance, abstraction, inheritance
- Multithreading :
  - support concurrent execution of thread
- Robust :
  - strong memory management and exception handling
- Secure :
  - No explicit pointer and run in virtual machine

1) **What is main principle of object oriented programming oop?**

The main principle of oop can divide into five types

- Encapsulation
- Polymorphism
- Abstraction
- Inheritance

Encapsulation :

- A class is an encapsulation of variable and method
- A package is an encapsulation of class and interface
- A rt.jar file is an encapsulation of java executable file

Polymorphism :
A single interface can perform different task like method overloading and method overriding

- Run time - method overloading
- Compile time - method overriding

Abstraction :

Hiding the implementation and showing the personality is know as abstraction

Inheritance :

A class is inherit the properties and method from another class is inheritances

2) **Differentiate between JDK, JRE, and JVM**

- JDK→(Java development kit) = provides tools for development (compiler and debugger)
- JRE → (Java RunTime Environment) = includes libraries and JVM for run java application
- JVM → (Java virtual machine) = converts the bytecode into machine code and execute it

3) Explain the concept of platform independency in java?

Java is compiled by byte code which is platform independent and executed by JVM which is specific platform to ensure the same program and executed any other OS compatible of JVM

4) **What is the significance of main method in java?**

The main method is a entry level of java application

Public static void main(String args[])

- Public → access globally
- Static → without creating the object just call the class name directly
- Void → no return type
- Args → accept command lines

5) **How does java achieve memory management?**

Java uses automatic garbage collector to manage memory management when we create an object when they do not have longer reference garbage collector delocates them.

6) **What is constructor?**

- Constructor is a special character will have the same name as the class name
- It is automatically executed when we create an object
- It will not allowed any modifier like abstract, static, finalize, synchronized
- It will not allowed any return type (void boolean …)

7) **What is method overloading?**

- The process of writing multiple method will have same name and different argument within the same class is known as method overloading

8) What is method overriding?

- The process of changing the super class implementation in the sub class is know as method overriding
- While overriding happens across the different class and is a relationship is mandatory
- While overriding the method name and argument name must be same
- While override the method it is write @Override is recommended

9) What is inheritance in java?

- Allowing a class to inherit the properties and method from another class is know as inheritance
- There are five types

- Single inheritance
    - A super contains one sub class is known as single inheritance

- Multi level inheritance
    - A super class contains one sub class that sub class contains another sub class is known as multi level inheritance

- Hierarchical inheritance
    - A class contains multiple sub class is known as hierarchical inheritance

- Hybrid inheritance
    - Combination of two or more class is know as hybrid inheritance

- Multiple inheritance
    - A sub class contains multiple super class is know as multiple inheritance
    - It is not recommended because it through diamond ring problem

10) **What is polymorphism?**

A single interface represent the different forms is known as polymorphism

- Example
    - compile time → method overloading
    - Run time → method overriding

11) **What is interface, abstract class, abstract.**

Interface :-

- Interface is a java definition block which contains variables method and object
- A variable inside an interface it should be static or final
- A method inside an interface it should be default, static, abstract,
- A interface created by using interface keyword
- A interface is not allowed concrete method
- A interface is not allowed non-static variable

Abstract class :-

- A class is created by using abstract keyword is technically called as abstract class
- A class inside an atleast one abstract method a class is mandatory to declare as abstract

Concrete method :

- A method having some implementation is technically called as concrete method

12) Describe access modifier in java?

- Public : access for globally
- Protected : access within the same class and sub class
- Default : access within the package
- Private : access within class and method.

13) What is encapsulation?

- A class is an encapsulation of variable and method
- A package is an encapsulation of class and interface
- A rt.jar file is an encapsulation of java executable file

    - Private modifier for fields
    - Getter and setter for access

14) **What is concept of package in java**?

- A package is a name space in java it is used to group related classes and interface
- It help to organise the code neat and clean
- To avoid name conflicts and manage access control
- There are two types of package in java (java.io , java.util) and user defined package.
- To create a package in the java application should be written in the top
- Without creating the package we all class and object stored in the default package
- If you use the another class package use import keyword

15) What are static variables and method?

- **Static variable**
    - If you think a static is common property for all object in a class
    - Imagine a class is a group and object is a member of the group if you declared a static variable is its common for everyone in this group
    - If you change the member of the group can see the changes everyone in the group

- **Static method**
    - A static method is a function belong to the class itself not for any specific object
    - If you do not create an object to call a method you just call directly by using of class name
    - Static method can works with other static thinks like (variable, method, and object).

17) **what is the lifecycle of a thread in java?**

- New → created new thread
- Runnable → ready to run
- Running → thread is executed
- Blocked / Awaiting / Sleeping → thread is waiting for resource
- Terminated → thread is executed

16) **What is exception handling ?**

Exception handling manage runtime error using try, catch, throw, throws and finally.

17) Difference between throw and throws keyword?

- Throw
    - Actually used for throw an exception
    - To written inside the method
    - Throw only one exception at a time
    - Example new Exception()
- Throws
    - Used to declare a method and throws one
    - To written inside a method signature
    - Throws a multiple exception at a time
    - Example IO Exception().

18) Difference between Checked and UnChecked Exception?

- Checked Exception
    - Checked by compile time
    - Throws keyword is mandatory
    - Must be handle using try and catch block declared by using throws keyword
    - Example
    - SQL exception
    - Interrupted Exception
    - CloneNotFound Exception
    - IO exception

- UnChecked Exception
    - Checked by runtime
    - Throws keyword is optional
    - Handling is optional
    - Example
    - Arithmetic exception
    - Null pointer exception
    - Class cast exception
    - StringIndexOutOfBound exception
    - ArrayIndexOutOfBound exception

19) Explain the concept of synchronization process?

- Synchronization is a process that allows only one thread at a time like (method, variables,or object)

- It is mainly for multithreading to prevent data inconsistency and unwanted behaviour its try to access or modify the same resource at a time

20) **what is java framework collection in java?**

- Java framework collection is a set of class and interface together provides readymade architecture to store and manipulate the object access collection effectively
- Its look like a toolbox to store and manage the data like (list, set, map)
- It contains interface like (list, map, queue, set)
- It contains class like (ArrayList, LinkedList, HashMap, HashSet) those implements to interface

21) Difference between ArrayList and LinkedList

- ArrayList
  - Underlying the data structure growable array
  - Worst insertion or deleting in the middle
  - Best retrieval or random access
  - Manipulation takes time
  - Random access
- Linked List
  - Underlying data structure double linked list
  - Best insertion or deleting in the middle
  - Worst frequent retrieval
  - Manipulation takes less time
  - No random access

22) **What is hashmap?**

- Hashmap stores the value in the key value pair
- It does not allow duplicate value
- It allow only one null and not multiple null
- It is not synchronization

23) What is significance of equals() and hashcode()?

- equals() —> checks logical equality
- hashcode() —> provides an unique value for an object in the hash based collection like hashmap

24) Difference between comparable and comparator ?

- Comparable
    - Default or natural sorting (Ascending or Descending order)
    - Compare To (Obj o)
    - Java.lang package
    - All wapper class
- Comparator
    - Own custom sorting
    - compare(Obj 1 , Obj2)
    - equals()
    - java .util.package
    - Collector , rule based collector

25) Difference between final, finally, finalize

- Final
    - Final is a keyword which is used to store the variable, method, and object
    - It as consider
    - Final int a = 10;
    - a = 20;
    - Once set a final keyword you will not do reinitalization
- Finally
    - Finally is a block which is associated with try and catch block
    - Try
    - {
    - \\ Risky code
    - }
    - Catch()
    - {
    - \\ Handle the code
    - }
    - Finally
    - {
    - }
- Finalize
    - Finalize is a protected method
    - Garbage collector invoked the finalize method just before destroying the object and cleanup activities

26) **What is wrapper class?**

Java is object oriented language but primitive datatypes like int, char..etc or not object Sometimes we used collection like ArrayList we can create object instead of primitive data in this situation we used wrapper class change the normal value into object java use them

27) What are annotation in java?

Java provides meta data about the program run and compile time

@override
@deprecated
@functionalInterface

28) What is difference between string buffer and String builder?

- String class is mutable we can perform any changes of an object which along with new object there is an memory leak problem
- In this problem to slove java developer introduced two more method
- String Buffer
- String Builder
- String Buffer and String builder is a finalize class in java
- String Buffer and String Builder is a inbuilt class in java which is present in java.lang package
- String Buffer and String Builder is not synchronized
- String Buffer and String Builder which is used to create by using of new keyword

29) What is string pool?

- It is a inbuilt class in java which is present in java.lang package
- It is immutable class
- In entire java String is class and object whose object is created by new keyword or without new keyword
- If a String created by new keyword the string will stored in the heap memory
- If a String is created without using of new keyword the string will stored in the string constant pool
- Some inbuilt method in string class like toUpperCase(), toLowerCase(), concat(),..etc

30) What is collection?

- Collection is a container we can store or holds group of objects

31) Why we use collection?

- To overcome the drawback of an array by using collection

32) **List out the drawback of an array?**

- Array contains only homogenous element not heterogenous element
- Array contains more memory wastage
- Array is continuous memory allocation
- Array is growable in natural means [once you create an array we cannot do increased and decreased the size of an array]
- Array is typically in nature [means not good choice for modification]
- CURD operation is difficult in array

33) Advantage for collection?

- Collection contains homogenous and heterogeneous element
- Collection contains less memory wastage
- Collection is continuous and non continuous memory allocation
- Collection is growable in nature means [once you create a collection the size of an collection will be increased or decreased at runtime]
- CURD is easy in collection

34) Difference between list and set?

- List
    - List allows duplicate value
    - List maintains insertion order
    - List allows null values
    - Common list implementation is arrayList and LinkedList
- Set
    - Set do not allow duplicate values
    - Set do not maintain insertion order
    - Set allow only one null value not multiple null
    - Common set implement is HashSet and LinkedHashSet

35) Difference between == and .equals()?

- **==**
    - **==** is a operator this compare the reference of the memory address
    - Not for content of the object
- **.equals()**
    - .equals() is a method this compare the content of the object if a String character must be same as another String character through true

36) What is bytecode?

- Byte code is a intermediate code is generated by java compiler after compiles the sources code it is platform independent and executed by jvm

37) What is object oriented programming?

- Java is a object oriented programming language it have some key features like
- Polymorphism
- Encapsulation
- Inheritance
- Abstraction

38) **What is object in java?**

- Object is a instance of class is a real world entity to holds states and behaviour state refer to the variables or data members and behaviour refer to the method or member function

39) What is class in java?

- Class is a blue print or template which is used to create an object it contains own states and behaviour state refer to the variables or data members and behaviour refer to the method or member function

40) What is default construction?

- Default constructor is a special method its run automatically when we create an object it does not take any values (No input)

41) What is super keyword?

- Super keyword is refer to the immediate parent class it is used to access or modify method or constructor

42) What is final keyword in java?

- Final keyword is a keyword once you declared a class, methods and variable we cannot modify or extended
- If you declared class as final you cannot extended the class
- If you declared the variable as final cannot be reinitialization or reassign
- If you declared the method as final you cannot change in the sub class

43) What is try block?

- Code throw an exception should be declared in try block

44) What is catch block?

- Code handle the exception should be declared in catch block

45) What is throw keyword in java?

If a programmer wants to do some task but create an own exception explicitly by the programmer use throw keyword

46) What is throws keyword in java?

- Throws keyword is a method signature it is used to declare a method and throws exception

47) **Difference between array and arraylist?**

- Array
    - Array is fixed we cannot add more after creating it
    - Array can store simple values like int, char
    - Works faster because it simple
    - No extra features do everything manually
    - Less memory wastage
- Array List
    - ArrayList is fixable we can add or remove after creating it
    - ArrayList can store only object like (String, Integer)
    - Works little bit slower because the size is automatically adjust
    - It have some features like adding removing etc
    - More memory wastage

48) **What is daemon thread**?

- Daemon thread is a background thread run in the background wants to perform some task such as garbage collector

49) **What is static keyword in java**?

- Static keyword in java is used for memory management it can be applied in class, methods, blocks, nested classes static members belongs to the class rather than instances

50) Difference between HashMap and HashTable?

HashMap

- It is not thread safe
- Allow only one null key and not multiple null values
- Generally faster and more memory efficiency

Hastable

- It is thread safe
- Does not allow null key and null value
- Sightly slower