Java Test 2

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Q1.What do you know about Java?

Java is an object oriented programming language which is used for creating web apps and desktop applications. Java was first invented by James Gosling in Sun Microsystem in 1995.

Q2.What are the supported platforms for the Java programming language?

There are 4 java platforms:

- Java platform Standard edition(J2SE)
- Java platform Enterprise edition(J2EE)
- Java platform Micro edition(J2ME)
- Java FX

Q3.List any five features of Java?

- Secure
- Architectural neutral
- Robust
- Platform independent
- User friendly
- Abstraction
- OOPS
- Portable
- Simple and Familiar

Q4.Why is Java Architectural neutral?

Java allows its application to be compiled in one hardware architecture and to execute on another hardware architecture which has JVM.

Q5.How java enabled High performance?

Java uses JIT(Just in time-compiler) for high performance.

Q6.Why is Java considered dynamic?

Java is considered dynamic because of Bytecode. The source code which is written in one platform can be executed in any platform with JVM. It loads the class file during runtime. Anything that happens in runtime is dynamic.

Q7.What is Java Virtual Machine and how is it considered in context of Java platform and independent feature?

JVM is an abstract machine.Java virtual machine is a part of Java run-time environment which converts source code into java bytecode. A source code written in one platform can be executed in another platform with the help of JVM hence it is platform independent.

Q8. List two Java IDE's?

- Netbeans IDE(Integrated Development Environment)
- IntelliJ IDE
- Eclipse IDE
- Virtual Studio

Q9.List some Java keywords(Unlike C,C++ keywords)?

- import
- super
- finally
- package

Q10. What do you mean by object?

An object is an instance of a class. An Object has a State, behavior and Identity.

The state of an object is stored in fields(Variables),while Method(Function) displays their behavior.

An object is created using the 'new' keyword.

Q11.Define class?

A class is a collection of related methods(Function).

A class is a group of objects which have common properties.

Q12. What kind of variables does a class consist of?

- Local variable
- Instance/non-static variable
- Class/Static variable

Q13. What is a Local variable?

A variable that is declared within a block and can only be accessed within that block is known as a local variable. Example for loop

Q14. What is an Instance variable?

Instance variables in Java are non-static variables which are defined in a class outside any method, constructor or a block. Each instantiated object of the class has a separate copy or instance of that variable. An instance variable belongs to class.

Q15.What is a Class variable?

A class variable is also known as a static variable. A class variable is any variable declared with the static modifier of which a single copy exists, regardless of how many instances of the class exist. In Java , the term “Fields” and “Variables” are used interchangeably for member variables.

Q16. What is a singleton class?

A singleton class is a class that can have only one object at a time. After the first time, if we try to instantiate the singleton class, the new variable also points to the first instance created.

Q17. What is a constructor?

Constructor are used to initialize the object's state. Like methods, a constructor also contains collections of statements(i.e instructions) that are executed at time of Object creation.

Q18. List the three steps for creating an Object for a class?

- Declaration
- Instantiation
- Initialization

Q19. What is the default value of byte datatype in Java?

Zero.

Q20. What is the default value of float and double datatype in Java?

Float – 0.0f

Double – 0.0d

Q21. When a byte datatype is used?

It is used to store integer data within the value of -127 to 128.

Q22. What is a static variable?

It is a variable which belongs to the class and initialized only once at the start of the execution. It is a variable which belongs to a class and not to an object(instance).

Q23. What do you mean by Access modifier?

They are used to set the accessibility(visibility) of classes, interface, variables, methods, constructors, data members, and the settle methods.

Q24. What is a protected access modifier?

The protected access modifier is accessible within the package and outside the package but through inheritance only.

Q25. What do you mean by synchronized Non access modifier?

The synchronized keyword used to indicate that a method can be accessed by only one thread at a time. The synchronized modifier can be applied with any of the four access level modifiers.

Q26. According to Java Operator precedence, which operator is considered to be with highest precedence?

In java, parentheses() and array subscript[] have the highest precedence in Java.

Q27. Variables used in a switch statement can be used with which data types?

The variables used in Switch statement can only be integer, convertible integers(byte, short, char), string and enums.

Q28. When can the parseInt() method be used?

This method returns the integer value which is represented by the argument in decimal equivalent.

Q29.Why is the String class considered immutable?

String is immutable in Java because String objects are cached in the String pool. Since cached String literals are shared between multiple clients there is always a risk, where one client's action would affect all another client. String in Java used the concept of String Pool Literal.

Q30.Why is StringBuffer called mutable?

The String class is considered as immutable so that once it is created a String object cannot be changed. If there is a necessity to make a lot of modifications to the String of characters then StringBuffer should be used.

Q31. What is the difference between StringBuffer and StringBuilder class?

StringBuffer is synchronized i.e thread safe . It means two threads can't call the methods of StringBuffer simultaneously.

StringBuilder is non-synchronized i.e not thread safe. IT means two threads can call methods of StringBuilder simultaneously

Q32.Which package is used for pattern matching with regular expressions?

Java.util.regex package is used for this purpose.

Q33. Java.util.regex consists of which classes?

Java Regex API provides 1 interface and 3 classes in java.util.regex package.

Q34. What are finalize() methods?

The Finalize method is used to perform cleanup operations on unmanaged resources held by the current object before the object is destroyed. The method is protected and therefore is accessible only through this class or through a derived class.

Q35. What is an exception?

An event that occurs during the execution of a program that disrupts the normal flow of instructions is called an exception. This is generally an unexpected or unwanted event which can occur either at compile-time or run-time in application code

36 . What do you mean by checked exceptions?

A Checked Exception is a type of Exception that must be either caught or declared in the method in which it is thrown

Example :

The java,io IO exception is a Checked Exception

37. Explain Runtime Exception?

The Runtime Exception is the Parent Class in all Exceptions of the Java Programming Language that are Expected to crash or breakdown the program or application they occur in. It should be noted that when a program is running out of memory , a program error is thrown instead of showing it as a Runtime Exception

38 . Explain Garbage Collection in java?

In java, garbage means unreferenced objects.Garbage Collection is the process of reclaiming the runtime unused memory automatically. In other words, it is a way to destroy unused objects.

To do so, we were using the free() function in C language and delete() in C++. But, in java it is performed automatically. So, java provides better memory management.

39 . Define Immutable Objects?

An object is considered immutable if its state cannot change after it is constructed .Immutable objects are particularly useful in concurrent applications .Since they cannot change state ,they cannot be corrupted by thread interference or observed in an inconsistent state.

40. Explain the usage of this() with the constructor?

This is a keyword in Java which *is used as a reference to the object of the current class*, within an instance method or a constructor. Using this you can refer to the members of a class such as constructors, variables and methods.

41 . Explain Set Interface?

A Set is a Collection that cannot contain duplicate elements. It models the mathematical set abstraction.

The Set interface contains only methods inherited from Collection and adds the restriction that duplicate elements are prohibited.Set also adds a stronger contract on the behavior of the equals and hashCode operations, allowing Set instances to be compared meaningfully even if their implementation types differ.

42. Explain Tree Set?

Java TreeSet class implements the Set interface that uses a tree for storage. It inherits AbstractSet class and implements the NavigableSet interface. The objects of the TreeSet class are stored in ascending order.

43. What is a Comparable Interface?

java Comparable interface is used to order the objects of the user-defined class. This interface is found in the java.lang package and contains only one method named compareTo(Object). It provides a single sorting sequence only, i.e., you can sort the elements on the basis of a single data member only. For example, it may be rollno, name, age or anything else.

44. Difference between throw and throws?

The throw and throws is the concept of exception handling where the throw keyword throw the exception explicitly from a method or a block of code whereas the throws keyword is used in signature of the method.

sr. no.	Basis of Differences	throw	throws
.	Definition	Java throw keyword is used to throw an exception explicitly in the code, inside the function or the block of code.	Java throws keyword is used in the method signature to declare an exception which might be thrown by the function while the execution of the code.
.	Type of exception	Using throw keyword, we can only propagate unchecked exception i.e., the checked exception cannot be propagated using throw only.	Using throws keyword, we can declare both checked and unchecked exceptions. However, the throws keyword can be used to propagate checked exceptions only.
.	Syntax	The throw keyword is followed by an instance of Exception to be thrown.	The throws keyword is followed by class names of Exceptions to be thrown.

.	Declaration	throw is used within the method.	throws is used with the method signature.
.	Internal implementation	We are allowed to throw only one exception at a time i.e. we cannot throw multiple exceptions.	We can declare multiple exceptions using throws keywords that can be thrown by the method. For example, main() throws IOException, SQLException.

44. Explain the program line used under java program

Public static void main(string[] args):

In Java programs, the point from where the program starts its execution or simply the entry point of Java programs is the **main()** method. Hence, it is one of the most important methods of Java and having proper understanding of it is very important.

Public: It is an *Access modifier*, which specifies from where and who can access the method. Making the *main()* method public makes it globally available. It is made public so that JVM can invoke it from outside the class as it is not present in the current class.

Static: It is a *keyword* which when associated with a method, makes it a class related method. The *main()* method is static so that JVM can invoke it without instantiating the class. This also saves the unnecessary wastage of memory which would have been used by the object declared only for calling the *main()* method by the JVM.

Void: It is a keyword and used to specify that a method doesn't return anything. As the main*()* method doesn't return anything, its return type is *void*. As soon as the *main()* method terminates, the java program terminates too. Hence, it

doesn't make any sense to return from the main*()* method as JVM can't do anything with the return value of it.

main: It is the name of Java main method. It is the identifier that the JVM looks for as the starting point of the java program. It's not a keyword.

String[] args: It stores Java *command line arguments* and is an array of type *java.lang.String* class. Here, the name of the String array is *args* but it is not fixed and users can use any name in place of it.

45. Define Java Runtime Environment?

Java Run-time Environment (JRE) is part of the Java Development Kit (JDK). It is a freely available software distribution which has Java Class Library, specific tools, and a stand-alone JVM. It is the most common environment available on devices to run java programs. The source Java code gets compiled and converted to Java bytecode. If you wish to run this bytecode on any platform, you require JRE. The JRE loads classes, verifies access to memory, and retrieves the system resources. JRE acts as a layer on the top of the operating system.

46. What is Polymorphism?

Polymorphism in Java is a concept by which we can perform a *single action in different ways*. Polymorphism is derived from 2 Greek words: poly and morphs. The word "poly" means many and "morphs" means forms. So polymorphism means many forms.

There are two types of polymorphism in Java: compile-time polymorphism and runtime polymorphism. We can perform polymorphism in java by method overloading and method overriding.

If you overload a static method in Java, it is an example of compile time polymorphism. Here, we will focus on runtime polymorphism in java.

47. What is Abstraction?

Abstraction is a process of hiding the implementation details and showing only functionality to the user.

Another way, it shows only essential things to the user and hides the internal details, for example, sending SMS where you type the text and send the message. You don't know the internal processing about the message delivery.

48. When Abstract methods are used?

To secure the data and then hiding the Users data Abstract Method can be used.

49. What is Encapsulation?

Encapsulation in Java is a mechanism of wrapping the data (variables) and code acting on the data (methods) together as a single unit. In encapsulation, the variables of a class will be hidden from other classes, and can be accessed only through the methods of their current class. Therefore, it is also known as data hiding.

50. What are the primary benefits of Encapsulation?

- It reduces human errors
- Encapsulation protect the objects from unwanted access of clients
- Simplifies the maintenance of the application
- Makes the application easier to understand

51. What is an 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 in the Java interface, not method bodies. It is used to achieve abstraction and multiple inheritance in Java.

In other words, you can say that interfaces can have abstract methods and variables. It cannot have a method body.

52. Give Some Features of Interfaces?

Interface cannot be instantiated

An interface does not contain any constructors.

All of the methods in an interface are abstract.

53. Define packages in java?

A **java package** is a group of similar types of classes, interfaces and sub-packages.

Packages in java can be categorized in two forms, built-in package and user-defined package.

There are many built-in packages such as java, lang, awt, javax, swing, net, io, util, sql etc.

Here, we will have the detailed learning of creating and using user-defined packages.

Ex: class name will be given by user so class name is a user define package

55. Why are packages used?

- To Avoid name conflict
- To write a better maintenance code

56. What do you mean by Multithreading?

Multithreading in Java is a process of executing multiple threads simultaneously.

A thread is a lightweight sub-process, the smallest unit of processing. Multiprocessing and multithreading, both are used to achieve multitasking.

However, we use multithreading rather than multiprocessing because threads use a shared memory area. They don't allocate a separate memory area so saves memory, and context-switching between the threads takes less time than process.

Java Multithreading is mostly used in games, animation, etc.

57. What are the two Subclasses under the Exception class?

- Io Exception class
- Runtime Exception class

58. When Throws Keyword used?

The **Java throws keyword** is used to declare an exception. It gives information to the programmer that there may occur an exception. So, it is better for the programmer to provide the exception handling code so that the normal flow of the program can be maintained.

59. When is the Throw Keyword used?

The Throw Keyword in java is used to explicitly throw an exception from a method or any block of code . we can throw a checked or unchecked exception . The Throw keyword is mainly used to Throw Custom Exceptions.

60. How is it finally used under Exception handling?

Java finally block is always executed whether an exception is handled or not. Therefore, it contains all the necessary statements that need to be printed regardless of whether the exception occurs or not.

The finally block follows the try-catch block.

61. Define Inheritance?

Inheritance in Java is a mechanism in which one object acquires all the properties and behaviors of a parent object. It is an important part of OOPs (Object Oriented programming system).

62. When is the Super keyword used ?

It is used to call superclass methods, and to access the superclass constructor.

The most common use of the super keyword is to eliminate the confusion between superclasses and subclasses that have methods with the same name.

63.What is Null Pointer Exception?

Null Pointer Exception is a runtime exception in java that occurs when a variable is not pointing to any object and refers to nothing or null.Since the NullPointer Exception is a runtime exception , it doesn't need to be caught and handled explicitly in application code.

64.What are the ways in which a thread case enters the waiting state?

A thread can enter the waiting state by invoking its sleep() method, by blocking on IO, by Unsuccessfully attempting to acquire an object lock,or by invoking an objects wait() method.It can also enter the waiting state by invoking its(deprecated) suspend() method.

65. How does multi-threading take place on a computer with a single cpu?

In a multithreaded process on a single processor the processor can switch execution resources between threads resulting in concurrent execution.Concurrency indicates that more than one thread is making progress,but the threads are not actually running simultaneously.

66. What Invokes a Thread's run() Method?

Invoking the Thread.start() method instructs the java runtime to start executing the threads run() method using the started thread.when a Thread object run() method is invoked directly, the statement in the run() method are executed by the current thread rather than by the newly created thread.

67. Does it matter in what order the catch statement for file not found Exception and IO Exception are Written?

Yes, it does. The FileNoFoundException is inherited from the IOException. Exception's subclasses have to be caught first.

68. What is the difference between yielding and sleeping?

Sleep (long milliseconds,int nanoseconds) specifies millisecond and nanosecond as an argument . According to oracle docs,the yield method temporarily paused the current execution thread to give the remaining waiting threads the same priority to execute.

69. Why is the vector class used?

Vector is like a dynamic array which can grow or shrink in size. unlike array,we can store n-number of elements in it as there is no size limits.

It is recommended to use the vector class in the thread-safe implementation only.

70. How many bits are used to represent unicode ascii utf-16 and utf-8 characters?

s.no	codes	size/bits
1	ASCII	7 bits (represented as 8 bits)
2	utf-16	8,16 bits,18 bit patterns
3	utf-8	16 bits and large bit patterns
4	unicode	16 bits

71. What is the difference between a window and a frame?

A window is an undecorated Frame. That is it doesn't have a title bar, border and any close button. It is just a container, which holds children components on it like buttons, labels, text field, etc. Simply, we can say it is an imaginary rectangle. The default layout to place these children is Border Layout.

A Frame is derived from window but it has title bar, border, close button, minimize button, resizable and movable options. By default it also has a Border Layout.

A frame is a part of a window, but a window is not a part of the window.

72. Which package has a lightweight component?

javax.Swing package. All components in Swing, except JApplet, JDialog, JFrame and JWindow are lightweight components.

73. What is the difference between paint() and repaint() method?

The **paint ()** method supports painting via a **Graphics** object. This method holds instructions to paint this component. Actually, in Swing, you should change paintComponent() instead of paint(), as paint calls paintBorder(), paintComponent() and paintChildren(). You shouldn't call this method directly, you should call repaint() instead.

The **repaint ()** method is used to cause paint () to be invoked by the **AWT** painting method. This method can't be overridden. It controls

the update() -> paint() cycle. You should call this method to get a component to repaint itself. If you have done anything to change the look of the component, but not it's size (like changing color, animating, etc.) then call this method.

74. What is the purpose of file class?

The File class is an abstract representation of file and directory pathname. A pathname can be either absolute or relative.

The File class has several methods for working with directories and files such as creating new directories or files, deleting and renaming directories or files, listing the contents of a directory etc.

75. What is the difference between Reader/Writer class hierarchy and input stream class/output stream class hierarchy?

The Reader/Writer class hierarchy is character-oriented, and the Input Stream/Output Stream class hierarchy is byte-oriented. Basically there are two types of streams.Byte streams that are used to handle streams of bytes.

76. Which class should you use to obtain design information about an object?

The class should be used to obtain design information about an object.

77. What is the difference between static and non static variables?

Static Variable

A static variable is also called a class variable and is common across the objects of the class and this variable can be accessed using class name as well.

Non-Static Variable

Any variable of a class which is not static is called a non-static variable or an instance variable.

Following are the important differences between static and non-static variables.

Sr. No.	Key	Static	Non-Static
1	Access	A static variable can be accessed by static members as well as non-static member functions.	A non-static variable can not be accessed by static member functions.
2	Sharing	A static variable acts as a global variable and is shared among all the objects of the class.	Non-static variables are specific to the instance object in which they are created.
3	Memory allocation	Static variables occupy less space and memory allocation happens once.	A non-static variable may occupy more space. Memory allocation may happen at run time.