

Q-1) what is difference between JDK,JRE and JVM?

Ans :

- JDK:Java development . JDK provides environment to developed and run java program.(Required for Developer side)[JDK=JRE + Development tools]
- JVM : Java virtual machine . JVM is Interpreter its run our program line by line
- JRE : Java Runtime Enviroment.Its only provide a runtime environment its not responsible for developing the code.[JRE = JVM + Library classes]
- It's only responsible for run the program. (Only Client Side required)

Q-2) what is JIT compiler?

Ans:

- JIT : Just-In-Time.
- JIT play role in .NET development .
- Its part of CLR : Common language Runtime in .NET
- JIT is responsible for managing the execution of .Net in any language which supports .Net .
- Its converts intermediate language to machine code .
- There are three type in JIT compiler :
  - Pre-JIT Compiler .
  - Normal-JIT Compiler.

## Econo-JIT Compiler.

- Pre-JIT Compiler: write Code in Java OR C# then its compile with there own supported compiler After that its converted into a Common intermediate language then with the help of the pre-JIT compiler we can convert the code into machine language and finally execute with .exe file[Conversion in single cycle]
- Normal-JIT Compiler : After compiling with Pre-JIT compiler CIL (Common Intermediate language) is converted into the Machine code. Then with the help of the Normal JIT compiler then we save code in cache memory , for quick accessing at the time of execution with help of Normal JIT-compiler.
- Econo-JIT Compiler: In this JIT compiler unwanted Method are removed .

Q-3) what is class loader?

Ans:

- There are mainly three class loader :
  - 1)Bootstrap class loader.
  - 2)Extension class loader.
  - 3)Application class loader.
- Class loader subsystem follows the Delegation hierarchy algorithm.
- When JVM interpretate code line by line at that time its goes thorw class its check this class file already loaded

Or not if .class file is already loaded then JVM is used already loaded .class file from Method area

- In another case if .class file is not already loaded then JVM request to delegation class loader Sub system to load that particular .class file.
- Then class loader subsystem forward the request to Application class loader .
- Then Application class loader delegates to Extension class loader
- Then Extension class loader delegates the request to bootstrap class loader.
- Bootstrap class loader search in bootstrap class path. (JDK,JRE,LIB,\*.JAR);
- If it is found in Bootstrap class path then its load it into the .class into JVM .if it is not found
- Then bootstrap class loader delegate request to extension class path (JDK,JRE,LIB,EXE ,\*.JAR) and extension class loader search it into the extension class path.If it is found it into the extension class path its load it into the JVM. otherwise its delegate request to Application class loader.
- Application class loader search it in to the Application class path.(Environment variable Class path);
- If it is found then its load it into the JVM otherwise it generate Runtime Exception class not found Exception

Q-4) Explain various memory logical partitions .

Ans:

- Mainly there are two partitions :1) Continuous memory allocation 2) Non continuous memory allocation .

1) In Continuous memory allocation

1. Fixed Size Partitioning
2. Variable Size Partitioning

- In this method, physical memory i.e. main memory (user space) is divided into fixed number of partitions and size of each partition remains fixed.
- If any process is requesting for the memory it can be loaded into main memory in any free partition in which it can be fit
- **Disadvantages:**
  - Internal fragmentation: if memory remains unused which is internal to the partition.
  - Degree of multi-programming is limited to the number of partitions in the main memory.
  - Maximum size of a process is limited to max size partition in the main memory.
  - To overcome limitations/disadvantages of fixed size partitioning method, variable/dynamic size partitioning method has been designed.

2) Variable/Dynamic Size Partitioning:

- In this method, initially whole user space i.e. physical memory is considered as a single free partition, and processes get loaded into the main memory as they request for it.

- Size of partition and number of partitions are not fixed in advanced, it gets decided dynamically.

#### **\*\*Advantages:**

- There are very less chances of internal fragmentation
- Degree of multi-programming is not limited/fixed
- Size of the process is not also limited, any size process may get load into the main memory.

#### **\*\*Disadvantages:**

- External fragmentation: due to loading and removing of processes into and from the main memory, main memory is fragmented - i.e. gets divided into used partitions and free partitions.

#### **2) Non- contiguous Memory Allocation:**

Under this method, process can complete its execution even if memory gets allocated for it in a non - contiguous manner, and it can be achieved by two memory management techniques:

1. Segmentation
2. Paging

So by using segmentation & paging techniques, process can complete its execution even after memory gets allocated for it in a non- contiguous manner.

Q-5) what gives Java its "write once and run anywhere nature"?

Ans:

- When we write code in java programming language.
- We create .java file which is platform dependent that's means you can write code in any machine OS like on windows ,Linux so compiler are different.
- If you compile on different OS it will create one executable file in Byte code
- This byte code file is not a platform dependent
- This byte code file is platform independent , means you can able Run code on any type of OS .
- That's way java has a "Write once and run anywhere nature".

Q-6) Explain History of Java. who invented Java?

Ans:

- Java is computer based programming language  
Developed by sun microsystem in early 1990's.
- Java invented by James Gosling and Team.
- In 1991 James Gosling and team name as Green team and start project for developing java.
- At first time when java was invented java name is Greentalk with extension .gt .

- After that they again change name to OAK ,but with OAK name there is already one existing industry . At last they decided to give name Java in 1995.
- At that time with using Java they create Setbox,Remote like device .
- In 2010 sun microsystem sell java to Oracle Corporation.
- Mainly three type of java
  - 1)Core java
  - 2)Advance java
  - 3)Android java

Q-7) what was original name of Java? why it was renamed?

Ans:

- At first time when java was invented java name is Greentalk with extension .gt .
- After that they again change name to OAK ,but with OAK name there is already one existing industry . At last they decided to give name Java in 1995.

Q-8) List features of Java.

Ans :

- Simple : Java is simple programming language and easy to understand that does not contain

complexity that exist in prior programming language.

- Object-Oriented : Java is object oriented programming language ,which means everything in java wright in Object and classes .
- The main concept of OOPL is
  - 1)Abstraction
  - 2)Encapsulation
  - 3)Polymorphisum
  - 4)Inheritance
- Platform Independent / Portable : If you compile on different OS it will create one executable file in Byte code
  - This byte code flie is not a platform dependent
    - This byte code file is platform independent , means you can able Run code on any type of OS .
- Robust : It means capable to handle Unexcepected termination of program .Java can handle this type of termination with exception handling.
- Secure : Todays era is about security in every web application bec all devices are connected with each other with internet there is a chances to hack our device .So on this note java Security features come into pitcher .
- Interpreted : In programming language we lerned aout it some language are using Compiler or some language are using Interpreter



But Java can use both compiler as well as interpreter.

Q-9) List various Datatypes in Java.

Ans :

Date type	Size(Byte)	Range
1) byte	1	127 to -128
2) short	2	32767 to -32768
3) int	4	$-10^{31}$ to $(10^{31}) - 1$
4) long	8	$-10^{63}$ to $(10^{63}) - 1$
5) float	4	$-7.2E+75$ to $7.2E+75$
6) double	8	
7) char	2	\u0000 to \uFFFF
8) boolean		

Q-10) what is difference between

- `System.out.print` : Main purpose is Giving Standard output on same line continue not on next line ;
- `System.out.println` :Main purpose is Giving Standard output on Next line because of “\n” ;
- `System.err.print` :Main purpose is giving Standard Error;

Q-11) How is Java Platform independent?

Ans :

- When we write code in java programming language.
- We create .java file which is platform dependent that's means you can write code in any machine OS like on windows ,Linux so compiler are different.
- If you compile on different OS it will create one executable file in Byte code(With Help of JVM)
- This byte code file is not a platform dependent
- This byte code file is platform independent , means you can able Run code on any type of OS .

Q-12) what is bytecode? How is it different from machine code?

Ans :

Machine Code :

- Its set of instruction which understood by machine.
- In Machine code means in Binary code can only understand by machine
- But with the different type of OS machine the execution files are different type like , in windows .exe On linux .shell/.out & on mac os .out
- All different type of OS create different execution files.They are particular platform dependent.We can also called it as Machine dependent code .

Byte Code :

- Its set of instruction in byte code which machine cannot understand directly.

- In Java like language we first write code in java that's create .java file then we compile with one compiler at that time its not a Platform independent .
- Than with the help of compiler we convert it first into Byte code but its not directly understand by machine,But it's platform independent you can run this code on any type of platform with the help of Java virtual machine.

Q-13) what is difference between Jar file & Runnable jar file?

Ans:

- Jar file : The main difference is Jar file can not run directly if you want to run then use a command prompt and write File name with some command and run it this all things required for run Jar file.
- Runnable Jar: Runnable jar file/java class does not required any type of command for run the java file .cmd is not requird any type of File name and command .you have to directly double click on file name and it will work properly .

Q-14) what is difference between Runnable jar file & exe file?

Ans :

- Runnable Jar: Runnable jar file/java class does not required any type of command for run the java file .cmd is not required any type of File name and command .you have to directly double click on file name and it will work properly .
- Executable file : EXE is a computer file that contain an encoded sequence of instruction that the system can execute directly , when you run command or in click on file icon

Q-15) How is C platform dependent language?

Ans :

- When we write code in c OR c++ language at that time create .c OR .cpp file on our particular machine /OS .
- For a particular machine we use particular compiler on this machine. If we compile out existing code on this compiler at that time this compiler generates particular .file
- This file is in machine code (Binary ) this is platform dependent that means,you can not run this .exe file in another platform Ex. Windows create .a exe file , linux creates .out .shell file
- So if you create .exe file on one particular machine you have to run on same machine
- It is not possible to run this code on another machine.it called as “Platform dependant “ .

Q-16) what is difference between path & class path?

- Class path:

Class path where all the .class files are available. java compiler and JVM will use .class file at the time of compilation.

If you do not set class path then program may not compile or run.

- Path :

When we write code in java and whenever we try to compile this java file we write EX . javac Test.java .

At that time the whole responsibility of checking this all file with Syntax ,logic and all things is responsible for javac .

When javac checks all file at that time javac.exe file will be executing this exe file is responsible for all this activity.

Then where javac.exe file will be available is search from Path location .

Path describes location where javac .exe(JDK/bin) is available .

If we don't set path then java command doesn't work.