Ans1:- Components of JDK:-

1. **Javac:-** javac is a java compiler. It compiles java source code and convert into bytecode.
2. **Jre:-** It is the root directory of the java runtime environment used by the JDK development tools.
3. **Jvm:-** A runtime environment that executes java bytecodes, enabling java programs to run on any device or operating system.

Ans2:- JDK:- It is a tool and libraries combined with java runtime environment and java virtual machine.

JVM:- A runtime environment that executes java bytecodes, enabling java programs to run on any device or operating system.

JRE:- It is the root directory of the java runtime environment used by the JDK development tools. This directory is present in the JDK installation for convenience, specially when testing Java applications. It includes only the essential components needed to run Java applications:-

- rt.jar-----Which contain all core java API
- JVM----- A runtime environment that executes java bytecodes, enabling java programs to run on any device or operating system.

Ans3:- Role of JVM in java:- The role of JVM in java is that it reads the code and convert it into machine code.

How Jvm execute java code:- It reads the code and convert it into machine code.

Ans4:- Memory management system in jvm:- In java, memory management is an automatic process that is managed by the java virtual machine (JVM). In this, memory is divided into two main types: stack and heap.

Ans5:- JIT compiler and its role in jvm:- jit compiler helps to improve the performance of java programs by compiling bytecodes into native machine code at run time.

Bytecode:- It is assembly language code written in class. It is object oriented assembly code which is use for JVM.Bytecode is executed by jvm. It comes under .class file. Bytecode is important for java

Ans6:- Architecture of JVM:-
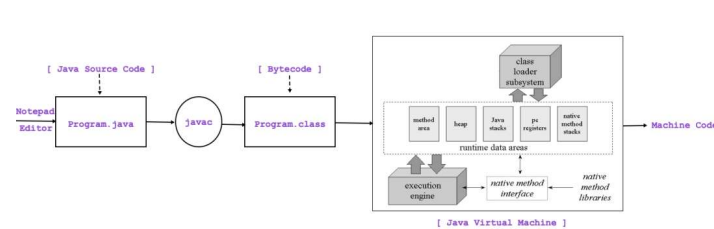
We have a editor like notepad. In this, I am writing source code and save that code with name program.java. Now, we have to compiler that file so for that we use javac. Javac is use to check the syntax and convert it into .class file. jvm is use to read code and convert it into bytecode. There are some components of JVM with the help of that it convert into machine code.

Ans7:- Java achieve platform independence through the JVM:- Java is a platform- independent because it is compiled to a bytecode that can be run on any device that has a java virtual machine(JVM). We can write a java program on one platform and then run it on a different platform without making any changes to the code.

Ans8:- Significance of the class loader in java:- Class loaders are responsible for loading java classes dynamically to the JVM (java virtual machine) during runtime.

Process of garbage collection in java:- Garbage collection is the automated process of deleting code that's no longer needed or used.