**ASSIGNMENT TOPIC: Fundamental**

1. **Features of Java**.

Ans: 1.Simple 7.Architecture neutral

2.Object Oriented 8. Interpreted

3.portable 9.High performance

4.Platform independent 10.Multithreaded

5,Secured 11.Distributed

6.Robust 12.Dynamic

2)**Difference between JDK,JRE and JVM.**

Ans: **JDK**: The JDK is a software development kit that develops applications in java. The JDK primarily assists in executing codes.it primarily functions in development. The JDK is platform dependent.it means that for every different platform. You require a different JDK. JDK consists of various tools for monitoring, and developing java application.

**JRE:** The java runtime environment is an implementation of JVM. It is a type of software package that provides class libraries of java, JVM, and various other components for running the applications written in java programming. JRE has a major responsibility for creating an environment for the execution of code. JRE is also platform dependent .it means that for every different platform, you require a different JRE.

**JVM:** The java virtual machine is a platform independent abstract machine that has three notions in the form of specifications. This document describes the requirement of JVM implementation. JVM specifies all of the implementation. It is responsible for providing all of these implementations to the JRE. The JVM is platform independent. It means that you won’t require a different JVM for every different platform.

**3)Java is a platform independent?**

**Ans:** A java compiler instead of translating java code to machine language code , translate it into java Bytecode. A java interpreter ,called the java virtual machine , translate the bytecode into machine code and then executes it. The bytecode can be run on any platform as long as it has a JVM running on it. This makes java programs platform independent and highly portable.

**4)Three flavors of java.**

**Ans:** [1] Standard edition: which is used for developing Standalone Applications. It is also known as J2SE, JSE.

[2] Enterprise edition: which is used for developing web applications. It is also known as J2EE, JEE.

[3] Macro edition application: which is used for developing device programs and mobile. It is also known as J2ME, JME.

**5) how many types of memory areas are allocated by JVM?**

**Ans:** The five types of memory it allocated are:

1.Method area or Class area

2. The Heap Area

3. Stack Area

4.Program Counter Register or PCR

5.The native method stacks

**6)what is the latest version of Java?**

**Ans:** The latest version of Java is Java 15 or JDK 15.

**7)what is write once, Run anywhere (WORA)?**

**Ans:** Write once, Run anywhere is a term that to a particular program’s supposed ability to run on all common operating systems. The term, sometimes also expressed as write once, run anywhere, was originally coined by Sun Microsystems in reference to Java.

When a program has WORA capability, then it should work on devices that use all of the popular versions of Windows, the Mac OS, Linux, Android, Solaris, NetWare, HP-UX, or any other OS or platform, whether the physical machine happens to be a mainframe, a desktop computer, a notebook computer, a tablet device, or a smartphones. The WORA capability requires that each machine’s OS contain modifications that interpret the compiled WORA program’s bytecode so that the machine’s processor can perform the WORA program’s instruction. In case java, for example, each device’s OS must have its own version of JVM.

**8)Is Java a pure/fully object oriented language?**

**Ans:** Java is not a pure object oriented language because fully object oriented language which supports or have features which treats everything inside program as objects. It doesn’t support primitive datatype.

**9)what is bytecode?**

**Ans:** Java bytecode is the instruction set for the java virtual machine. It acts similar to an assembler which is an alias representation of a C++ code. As soon as a java program is compiled, java bytecode is generated. In more apt terms, java bytecode is the machine code in the form of a .class file. With the help of java bytecode we achieve platform independence in java.

**10)What is Heap space in Java?**

**Ans:** In java programming language, a user creates an object, and that object gets stored in the heap area of the java. It is the java restriction that a java application can only use a limited amount of memory. The JVM architecture is composed of essential tools and libraries, and the space area is divided into two different parts.

**11)Difference between EAR, JAR and WAR file in J2EE.**

**Ans:** **.jar files:** These files have .jar extension. A .jar file contains .class files, resources like .java and property files. The .jar file can be appended to environment variable CLASSPATH in order to any java application to access from remote package.

**.war files:** These files have the .war extension. The web application that is to be deployed on servlet or JSP container is too converted into .war file and can be deployed using Tomcat browser. The .war file can have. JSP, html, .js and any other file which would necessary for a web application.

**.ear files:** The enterprise application that are to be deployed in EJB container are to be placed in an .ear file.

**12)Explain memory leak in java.**

**Ans:** The memory leak is a situation when the garbage collector does not recognize the unused objects and they remain in the memory indefinitely that reduces the amount of memory allocated to the application. Because the unused objects still being referenced that may lead to OutOfMemoryError**.** It is also affects the reliability of the application.

**13)How garbage collection work in java?**

**Ans:** In java, garbage collection is the process of managing memory, automatically. It finds the unused objects and delete or remove them to free up the memory. The garbage collection mechanism uses several GC algorithms. The most popular algorithm that is used is Mark and Sweep

**15) Why Garbage collection required in java?**

**Ans:** Java garbage collection is the method by which java programs achieve automatic memory management. Java programs compile to bytecode which will be run on a java Virtual Machine. Once java programs run in the JVM, objects are created on the heap, which is a portion of memory dedicated to the program. Finally, some objects cannot be required. The garbage collector finds these unused objects and deletes them to free up memory.

**16)W.A.J.P to Take three numbers from the user and print the greatest number.**

**Ans**: public class Main {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("input number a= ");

int a=sc.nextInt();

System.out.println("input number b= ");

int b=sc.nextInt();

System.out.println("input number c= ");

int c=sc.nextInt();

if(a>b&&a>c){

System.out.println("a = "+a+" is the greatest number.");

}else if(b>a&&b>c){

System.out.println("b = "+b+" is the greatest number.");

}else{

System.out.println("c = "+c+" is the greatest number.");

}

}

}

**B18.**

public class Main {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Input the year= ");

int a=sc.nextInt();

if(a%4==0){

System.out.println("The "+ a+" is a Leap year");

}else

System.out.println("This "+ a+" is not a leap year");

}

}