

## Concepts & Basics Answers

1)

Compiled programming languages are converted directly into machine code that the processor can execute.

Interpreted programming languages run through a program line by line and execute each command.

2)

Java is secure because it has no explicit pointer which makes Java more secure because they point to memory location or used for memory management that loses the security as we use them directly. Java programmes also run inside a virtual machine sandbox.

Java is platform independent as it is a write once, run anywhere language. Java is a software-based platform that runs on the top of other hardware-based platform. Java code is compiled by the compiler and converted into bytecode. This bytecode is a platform-independent code because it can be run on multiple platforms.

3)

A constant's value is fixed and only one copy of it exists in the program. Once declared, and assigned a value, you cannot change its value again throughout the program.

However, A variable is a container which holds the value while the Java program is executed. A variable can be thought of as a memory location that can hold values of a specific type. The value in a variable may change during the life of the program.

Differences – a variable can change its value while a constant is fixed.

Similarities – both store data.

4)

byte - Stores whole numbers from -128 to 127.

short - Stores whole numbers from -32,768 to 32,767.

int - Stores whole numbers from -2,147,483,648 to 2,147,483,647.

long - Stores whole numbers from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807.

float - Stores fractional numbers. Sufficient for storing 6 to 7 decimal digits.

double - Stores fractional numbers. Sufficient for storing 15 decimal digits.

boolean - Stores true or false values.

Char - Stores a single character/letter or ASCII values.

Examples:

```
byte myNum = 100;
```

```
short myNum = 5000;
```

```
int myNum = 100000;
```

```
long myNum = 150000000000L;
```

```
float myNum = 5.75f;
```

```
double myNum = 19.99d;
```

5)

Type casting is when you assign a value of one primitive data type to another type. Implicit casting is done automatically when passing a smaller size type to a larger size type. Whereas explicit casting is an instruction which specifies what data type to treat a variable as in a given expression. In implicit casting no data loss takes place unlike in explicit casting where it is possible for data to be lost.

6)

Overflow occurs when we assign such a value to a variable which is more than the maximum permissible value.

Example: If we assign  $10^{1000}$  to a variable type *int*, we will get an overflow error as the *int* data type only goes up to 2,147,483,647 and  $10^{1000}$  is larger.

7)

Encapsulation refers to the bundling of data, along with the methods that operate on that data, into a single unit.

Abstraction is the process of taking away or removing characteristics from something to reduce it to a set of essential characteristics.

Inheritance is the procedure in which one class inherits the attributes and methods of another class.

Polymorphism is the ability of a variable, function, or object to take on multiple forms. It describes the concept that different classes can be used with the same interface.