Static Keyword

Q1) Why do we need static keyword in Java. Explain with an example?

Ans) The static keyword in java is used for memory management mainly. We can apply static keyword with variables, methods, blocks and nested classes. The static keyword belongs to the class than an instance of the class. The static variable gets memory only once in the class area at the time of class loading. It is usefull when you want to create variables or methods that are shared across all instance of a class.

Eg -
```
public class MyClass{
    private static int count = 0;
    private String name;

Public MyClass (String name) {
    this.name = name;
    count ++;
}

Public static int getCount (){

    return count;
}
```

Q2) What is class loading and how does the Java program actually executes?

Ans) Class loading is the process by which JRE (Java runtime environment) dynamically loads Java classes into memory. When a Java program is executed, it's classes are not all loaded into memory at once, but rather as they are needed.

The Java class loader is responsible for locating the bytecode that represents a java class and loading it into memory. It works in a hierarchical manner, where classes are first searched in the bootstrap class loader, then the extensions class loader, and finally the system class lodder.

The class loading can be divided into three stages.

1) Loading - class loader search bytecode and loads into memory.
2) Linking - class loader perform a series of operations to prepare the class for execution.
3) Initialisation - class loader initialise the class by executing the static block & fields.

Q3) Can we mark a local variable as static

Ans) If we define a local variable inside a non-static method or block and mark it as 'static', the Java compiler would generate an error.

We can mark a local variable as 'static' but only if it is defined inside a static method or a static block.

Q4) Why is the static block executed before the main method in java?

Ans) The static blocks always execute first before the main() method, because the compiler stores them in memory at the time of class loading and before the object creation. Here, the compiler executes all the static block first, and after finishing the static block execution, it invokes the main() method.

Q5) Why is a static method also called a class method.

Ans) because it belongs to the class and not to any specific instance of the class. In other words, a static method is associated with the class itself, and not with any object created from the class.

Q6) What is use of static block?

Ans) A static block is a block of code enclosed in curly braces that is executed once when the class is loaded into the memory. It is used to initialize static variables, which are variables that belongs to the class itself & not to any instance of class.

Q7) Difference b/w static & instance Variables.

Ans) Instance Variables are created when an object is created with the use of Keyword 'new' and destroyed when the object is destroyed.
Static Variables are created when the program starts and destroyed when the program stops. Instance Varible can be accessed directly by calling the Variable name inside the class.

Static variables are allocated "static data area", whereas instance variable are allocated memory on the heap.

Q8) Difference b/w static and non static members.

Ans) Static Variables are shared among all instance of a class. Non static Variable are specific to that instance of a class.

Static Variable is like a global Variable and is available to all methods.

Non static Variables is like a local Variable & they can be accessed through only instance of class.