**Week 1: Assignment 1 - Answers with Explanations**

**1. Which of the following is true?**

* **Answer:** c. Java uses both interpreter and compiler.
* **Reasoning:** Java source code is first compiled into bytecode by the javac compiler. This bytecode is then interpreted and executed by the Java Virtual Machine (JVM).

**2. A Java file with extension '.class' contains**

* **Answer:** c. Java Byte code
* **Reasoning:** The javac compiler translates .java source code files into .class files, which contain Java bytecode. The JVM then executes this bytecode.

**3. Which of the following is not an object-oriented programming paradigm?**

* **Answer:** d. Dynamic memory allocation
* **Reasoning:** Encapsulation, inheritance, and polymorphism are the three core principles of object-oriented programming (OOP). Dynamic memory allocation is a feature of many programming languages, including Java, but it's not considered one of the core paradigms of OOP itself.

**4. What will be the output of the following Java code?**

class increment {

public static void main(String args[]) {

int g = 3;

System.out.print(++g \* 8);

}

}

* **Answer:** c. 32
* **Reasoning:** The prefix increment operator ++g first increments the value of g to 4, and then this new value is used in the multiplication. Therefore, the expression evaluates to 4cdot8=32.

**5. What is the correct sequence of steps to execute a Java program?**

* **Answer:** d. Edit rightarrow Compile rightarrow Run
* **Reasoning:** The correct sequence is to first **edit** or write the source code, then **compile** it into bytecode, and finally **run** the program using the JVM.

**6. What is the output of the above code?**

class NPTEL {

public static void main(String[] args) {

System.out.println("Hello, World!");

}

}

* **Answer:** a. Hello, World!
* **Reasoning:** The System.out.println() statement prints the string literal "Hello, World!" to the console, followed by a new line.

**7. What is the primary focus of Java programming?**

* **Answer:** c. Platform independence
* **Reasoning:** The main goal of Java is to achieve platform independence through the "write once, run anywhere" philosophy. The bytecode generated by the compiler can be executed on any machine that has a compatible JVM.

**8. Which of the following programming principles is a key aspect of Java?**

* **Answer:** c. Object-oriented programming
* **Reasoning:** Java is fundamentally an object-oriented programming language, built around the concepts of classes and objects.

**9. What is the primary purpose of the Java Virtual Machine (JVM) in the Java programming language?**

* **Answer:** b. Platform independence
* **Reasoning:** The JVM acts as a layer between the operating system and the Java bytecode. It translates the bytecode into machine-specific instructions, allowing the same code to run on different platforms without modification.

**10. What is the output of the following code?**

public class Question {

public static void main(String[] args) {

int x = 5;

x = (2 + 8);

System.out.println(x);

}

}

**Answer:** b. 10

* **Reasoning:** The code first initializes x to 5, but then immediately reassigns its value to the result of (2 + 8), which is 10. The System.out.println() statement then prints the new value of x, which is 10.