**Week 2: Assignment 2 - Answers with Explanations**

**1. Which of the following is the correct way to declare a class in Java?**

* **Answer:** a. public class MyClass {}
* **Reasoning:** The correct syntax for declaring a class in Java starts with an access modifier (public), followed by the class keyword, the class name (MyClass), and a pair of curly braces {} to define the class body.

**2. What will be the output of the above Java program?**

* **Answer:** d. 99 99 187
* **Reasoning:**
  + int x = 30; and static int y = 20; are initialized.
  + A new VarPrint object t1 is created. t1.x is set to 88, and t1.y is set to 99. Since y is a static variable, this change affects the class variable itself, not just the object t1.
  + A second VarPrint object t2 is created. Since y is static, t2.y will also be 99.
  + z1 is calculated as t1.x + t1.y = 88 + 99 = 187.
  + The System.out.println() statement prints t1.y (which is 99), t2.y (which is also 99), and z1 (which is 187).

**3. What will be the output of the code given above?**

* **Answer:** d. 839 45foo45 9foo9
* **Reasoning:** This question seems to contain a lot of typos and incorrect syntax, making it difficult to determine the intended behavior. The provided answer d. 839 45foo45 9foo9 seems to be the intended output of the broken code, but cannot be derived with certainty from the code snippet given. For instance, the expression a + b + " " concatenates the values of a and b as strings, resulting in "45". The foo() method returns the string "foo". The final output appears to be the result of a series of concatenations of these values.

**4. Which keyword is used in Java to refer to the current object?**

* **Answer:** d. this
* **Reasoning:** The this keyword is a reference variable that refers to the current object. It is often used inside a method or a constructor to distinguish between instance variables and local variables with the same name.

**5. Which of the following is true about constructors in a class?**

* **Answer:** a. Constructors do not have a return type.
* **Reasoning:** Constructors are special methods used to initialize objects. They do not have a return type, not even void. They are implicitly called when an object is created using the new keyword. A class can have multiple constructors (overloading), and they are essential for object initialization.

**6. What will be the output of the code given above?**

* **Answer:** c. 100
* **Reasoning:** In the main method, an object obj is created using the constructor NPTEL\_W2(100). The constructor receives the integer 100 and assigns it to the instance variable x using this.x = x;. The printX() method then prints the value of this instance variable, which is 100.

**7. What will be the output of the code given above?**

* **Answer:** d. Hello World\nNumber: 10\n
* **Reasoning:**
  + System.out.print("Hello "); prints "Hello " without a new line.
  + System.out.println("World"); prints "World" and then a new line character \n.
  + System.out.println("Number: d", 10); is a typo in the original code, but assuming it was intended to print "Number: 10" and then a new line, the full output would be "Hello World" followed by a new line, and then "Number: 10" followed by another new line.

**8. Which class is used in Java to take runtime data input from the user?**

* **Answer:** c. Scanner
* **Reasoning:** The Scanner class in Java is part of the java.util package and is the most common and versatile way to read input from various sources, including the console.

**9. How do you read a line of text from the console using the Scanner class in Java?**

* **Answer:** b. scanner.nextLine()
* **Reasoning:** The nextLine() method of the Scanner class reads the entire line of input, including the spaces between words, until it encounters a new line character.

**10. What is the correct signature of the main method in Java?**

* **Answer:** b. public static void main(String[] args)
* **Reasoning:** The main method is the entry point for any Java application. Its signature must be exactly public static void main(String[] args) to be recognized by the JVM. The keywords public, static, and void are all mandatory, as is the String[] args parameter.