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1. Which of the following statements about Java is true?

A) Java is a compiled language and does not require a virtual machine. B) Java supports multiple inheritance through classes. C) Java is platform-independent due to the Java Virtual Machine (JVM). D) Java allows operator overloading.

2. Consider the following code snippet:

```
class Animal {  
    void sound() {  
        System.out.println("Animal makes a sound");  
    }  
}  
class Dog extends Animal {  
    void sound() {  
        System.out.println("Dog barks");  
    }  
    void bark() {  
        System.out.println("Barking");  
    }  
}
```

What will happen if you call the method `sound()` on an object of `Animal` type but a `Dog` instance?

A) It will print "Animal makes a sound". B) It will throw a compilation error. C) It will print "Dog barks". D) It will result in a runtime error.

3. What will be the output of the following code?

```
int x = 5;  
int y = 10;  
System.out.println(x++ + ++y);
```

15 B) 16 C) 17 D) 18

4. Given the following method signatures, which statement about method overloading is correct?

```
void print(int a);  
void print(double a);  
void print(int a, double b);  
void print(double a, int b);
```

(A) All methods are overloaded based on the number of parameters only. B) Only the first two methods can coexist without conflict. C) The last two methods will cause a compilation error. D) All methods can coexist without any issues.

5. In Java, which keyword is used to prevent a class from being subclassed?

A) final B) static C) abstract D) synchronized

6. Consider the following code:

```
class Test {  
    int a = 5;
```

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```
void increment() { a++; }  
}  
public class Main {  
public static void main(String[] args) {  
    Test t1 = new Test();  
    Test t2 = new Test();  
    t1.increment();  
    System.out.println(t1.a + " " + t2.a);  
}  
}
```

What will be the output?

A) 6 5 B) 5 5 C) 6 6 D) Compilation error

7. **Which of the following expressions will result in a compile-time error?**

A) int result = 10 / 2; B) double x = 10 / 4; C) int z = 10.0 / 2; D) float y = 10 / 3.0f;

8. **What does the `this` keyword refer to in a constructor?**

A) The parent class of the current object. B) The current instance of the class. C) The class itself. D) A static reference to the current method.

9. **Which of the following statements correctly describes method overriding?**A) It occurs when two methods in the same class have the same name and parameters. B) It allows a subclass to provide a specific implementation of a method already defined in its superclass. C) It requires the use of the `static` keyword in the subclass. D) It is only applicable to methods that return a value.10. **In the context of method overloading, which of the following is a valid signature for a method named `calculate`?**

A) void calculate(int a, double b); B) void calculate(double a, int b); C) Both A and B are valid. D) void calculate(int a, int b, double c);