

# Java Genesis Chapter 8

## Quick Quiz

### Question 1

Consider the class A and its subclass B:

```
public class A {  
  
    public void m (int x) {  
        System.out.print(x);  
    }  
}  
  
public class B extends A {  
  
    public void m (int x) {  
        System.out.print(2*x);  
    }  
}
```

What is printed in the Output window by the following Java fragment?

```
A a = new A();  
B b = new B();  
a.m(3);  
b.m(3);
```

### Question 2

Consider the classes A and B whose code is given in Question 1. What is printed in the Output window by the following Java fragment?

```
A a1 = new A();  
A a2 = new A();  
B b1 = new B();  
a2 = b1;  
a1.m(3);  
a2.m(3);  
b1.m(3);
```

### Question 3

Consider the class C and its subclass D:

```
public class C {  
  
    protected int x = 1;  
    protected static int y = 7;  
  
    public void changeX ( ) {  
        setX();  
    }  
  
    public void setX ( ) {  
        x = 10;  
    }  
  
    public void changeY ( ) {  
        y = 70;  
    }  
}  
  
public class D extends C {  
  
    public void setX ( ) {  
        x = 20;  
    }  
}
```

What is printed in the Output window by the following Java fragment?

```
C c = new C();  
D d = new D();  
System.out.println(c.x+" "+d.x);  
System.out.println(c.y+" "+d.y);  
c.changeX();  
d.changeX();  
d.changeY();  
System.out.println(c.x+" "+d.x);  
System.out.println(c.y+" "+d.y);
```

## Question 4

Consider the class `Double` and its subclass `Quad`:

```
public class Double {
    protected int x = 5;

    public int getX ( ) {
        return x;
    }

    public void setX (int y) {
        x = y;
    }

    public void mult ( ) {
        x = 2*x;
    }
}

public class Quad extends Double {
    public void mult ( ) {
        // missing code goes here
    }
}
```

In the class `Quad` the method `mult` is redefined so that `x` is multiplied by 4. Which of the following Java fragments could be successfully substituted as the missing code for the method `mult`?

- (a) `x = 4*x;`
- (b) `super.mult();`  
`super.mult();`
- (c) `setX(4*getX( ));`
- (d) `2*super.mult( );`
- (e) `x = 4*getX( );`

## Question 5

Consider the class `Double` whose code is given in Question 4. Suppose the variable `x` were declared to be `private` rather than `protected`. In this case which of the options in Question 4 could now be successfully substituted as the missing code for the method `mult`?

## Question 6

Consider the class E and its subclass F:

```
public class E {  
  
    public int x;  
  
    public E ( ) {  
        x = 1;  
    }  
  
    public E (int y) {  
        x = y;  
    }  
}  
  
public class F extends E {  
    // code for constructor method is missing  
}
```

The class F has just one constructor method. Which of the following methods could be successfully added as the missing constructor method for the class F, so that when the Java fragment

```
F f = new F( );  
System.out.println(f.x);
```

is executed the integer 2 is printed in the Output window?

- (a) 

```
public F ( ) {  
    x = 2;  
}
```
- (b) 

```
public F ( ) {  
    super(2);  
}
```
- (c) 

```
public F ( ) {  
    int y = 2;  
    super(y);  
}
```
- (d) 

```
public F ( ) {  
    super( );  
    x = x+1;  
}
```
- (e) 

```
public F (int y) {  
    super(2);  
}
```

## Question 7

Consider the class G and its subclass H:

```
public class G {  
  
    public int num = 6;  
  
    public void mult ( ) {  
        num = 2*num;  
    }  
}  
  
public class H extends G {  
  
    public void mult ( ) {  
        super.mult( );  
        num = 2*num;  
    }  
  
    public void div ( ) {  
        num = num/2;  
    }  
}
```

What is printed in the Output window by the following Java fragment?

```
G g = new G( );  
H h = new H( );  
g = h;  
g.mult( );  
h.div( );  
((H)g).div( );  
System.out.println(g.num+" "+h.num);
```

## Question 8

Consider the class Q:

```
public class Q extends P {  
  
    public int x, y;  
  
    public Q (int a, int b) {  
        x = a;  
        y = b;  
    }  
  
    public Q (int a) {  
        super(a);  
    }  
}
```

Which of the following forms of constructor methods must exist explicitly in the class P?

- (a) `public P ( ) {...}`
- (b) `public P (int a) {...}`
- (c) `public P (int a, int b) {...}`
- (d) `public P (int a, int b, int c) {...}`

## Question 9

Consider the class Q whose code is given in Question 8. Which of the following Java fragments are legitimate calls to a constructor?

- (a) `Q q = new Q( );`
- (b) `Q q = new Q(1);`
- (c) `Q q = new Q(1,1);`
- (d) `Q q = new Q(1,1,1);`
- (e) `P p = new Q(1,1);`