

Metropolitan State University, St. Paul, MN
ICS 372 Object-Oriented Design and Implementation
Quiz 3 Solution

All questions are based on the following code.

```
public class B {

    public void m1() {
        System.out.println("B m1");
    }

    public void m2() {
        System.out.println("B m2");
    }
}

public class C extends B {
    public void m1() {
        System.out.println("C m1");
    }
}

public class D extends B {
    public void m1() {
        System.out.println("D m1");
    }

    public void m2() {
        System.out.println("D m2");
    }
}
```

Assume we have the following three statements that compile correctly.

```
B b1 = new B();
C c1 = new C();
D d1 = new D();
```

For each of the questions 1 through 5, suppose we place the statement given in the question after (but NOT necessarily immediately after) the statement `D d1 = new D();`. So there may be additional assignment statements between `D d1 = new D();` and the statement given in the question. Choose the most appropriate answer and circle it.

1. `b1 = c1;`

- (a) The statement does not generate a compilation error and always executes without throwing an exception. ✓

- (b) The statement does not generate a compilation error and its execution always results in an exception.
- (c) The statement does not generate a compilation error and its execution sometimes results in an exception.
- (d) The statement results in a compilation error.

2. `c1 = b1;`

- (a) The statement does not generate a compilation error and always executes without throwing an exception.
- (b) The statement does not generate a compilation error and its execution always results in an exception.
- (c) The statement does not generate a compilation error and its execution sometimes results in an exception.
- (d) The statement results in a compilation error. ✓

3. `b1 =(B) d1;`

- (a) The statement does not generate a compilation error and always executes without throwing an exception. ✓
- (b) The statement does not generate a compilation error and its execution always results in an exception.
- (c) The statement does not generate a compilation error and its execution sometimes results in an exception.
- (d) The statement results in a compilation error.

4. `c1 = d1;`

- (a) The statement does not generate a compilation error and always executes without throwing an exception.
- (b) The statement does not generate a compilation error and its execution always results in an exception.
- (c) The statement does not generate a compilation error and its execution sometimes results in an exception.
- (d) The statement results in a compilation error. ✓

5. `c1 = (C) d1;`

- (a) The statement does not generate a compilation error and always executes without throwing an exception.
- (b) The statement does not generate a compilation error and its execution always results in an exception.
- (c) The statement does not generate a compilation error and its execution sometimes results in an exception.
- (d) The statement results in a compilation error. ✓

For the rest of the questions, suppose we place the statements given in the question immediately after the statement `D d1 = new D();`. Choose the most appropriate answer and circle it.

6. What does the following code print?

```
b1 = c1;  
b1.m1();
```

- (a) B m1
- (b) C m1 ✓
- (c) D m1
- (d) Nothing. The code has a compilation error.

7. What does the following code print?

```
b1 = (B) d1;  
b1.m2();
```

- (a) B m2
- (b) D m2 ✓
- (c) Nothing. The code crashes.
- (d) Nothing. The code has a compilation error.

8. What does the following code print?

```
b1 = (B) c1;  
b1.m2();
```

- (a) B m2 ✓
- (b) C m1
- (c) Nothing. The code crashes.
- (d) Nothing. The code has a compilation error.

9. What does the following code print?

```
b1 = (B) c1;  
d1 = (D) b1;  
d1.m2();
```

- (a) B m2
- (b) D m2
- (c) Nothing. The code crashes. ✓
- (d) Nothing. The code has a compilation error.

10. What does the following code print?

```
Object o1 = d1;  
o1.m1();
```

- (a) B m1
- (b) D m1
- (c) Nothing. The code crashes.
- (d) Nothing. The code has a compilation error. ✓