

Exam on Object-Oriented Programming (Finals)

Test – Identification

Instructions:

- Read each question carefully.
 - Choose the best answer from the options provided.
 - Each question is worth three (3) points.
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1. What is polymorphism?

- A. The ability of a class to be inherited by multiple classes
 - B. The ability to perform a single action in different ways
 - C. The process of converting one type to another
 - D. A method of managing memory allocation
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2. What type of polymorphism is decided during compile time?

- A. Dynamic
 - B. Static
 - C. Overriding
 - D. Upcasting
-

3. Which of the following is an example of method overloading?

- A. `public void draw(int i) { }` and `public void draw(String s) { }`
 - B. `public void draw() { }` in parent class and `public void draw() { }` in child class
 - C. Casting an object from one class to another
 - D. None of the above
-

4. What does the following code print?

```
java
Copy code
public class Class1 {
    public String message() {
        return "Method";
    }
}
public class Class2 extends Class1 {
    public String message() {
        return super.message() + " Overriding";
    }
}
```

```
}  
public static void main(String[] args) {  
    System.out.print(new Class2().message());  
}  
}
```

- A. Method Overriding
 - B. Overriding
 - C. Method
 - D. Method Method
-

5. What is the process of casting from a subclass to a superclass called?

- A. Downcasting
 - B. Upcasting
 - C. Overloading
 - D. Overriding
-

6. Which of the following will throw a `ClassCastException` at runtime?

- A. Casting between unrelated classes
 - B. Upcasting from subclass to superclass
 - C. Downcasting from superclass to subclass with a valid object
 - D. Downcasting from superclass to subclass with an invalid object
-

7. Which rule about method overriding is correct?

- A. The child class method can have a more restrictive access modifier.
 - B. The child class method must have the same or more accessible access modifier.
 - C. The child class method must have a broader exception than the parent method.
 - D. Overriding methods cannot use inheritance.
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8. Which of the following methods would cause a compilation error?

- A. Parent class method is `protected`, and child class method is `public`.
 - B. Parent class method is `protected`, and child class method is `private`.
 - C. Parent class method throws no exceptions, and child class method throws a `RuntimeException`.
 - D. Parent class method throws an `ArithmeticException`, and child class method throws a `NullPointerException`.
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9. What is the purpose of the `super` keyword in method overriding?

- A. To access static methods
 - B. To call the parent class method
 - C. To perform downcasting
 - D. To create a new object
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10. Which type of exception can be thrown by a subclass method that overrides a superclass method?

- A. Any exception
 - B. A new or broader checked exception
 - C. A narrower or unchecked exception
 - D. No exception
-

11. Which of the following scenarios will not compile?

- A. Casting between unrelated classes
 - B. Downcasting with a valid object
 - C. Upcasting between a subclass and superclass
 - D. None of the above
-

12. What is the result of the following code?

```
java
Copy code
public class Animal { }
public class Cat extends Animal {
    public static void main(String[] args) {
        Animal a = new Animal();
        Cat c = (Cat)a;
    }
}
```

- A. Compiles and runs successfully
 - B. Throws a `ClassCastException` at runtime
 - C. Causes a compilation error
 - D. Results in infinite recursion
-

13. What is required for method overriding?

- A. The method names must be different.
- B. The method signatures must match.

- C. The access modifier of the subclass method must be less restrictive.
 - D. The parent class method must throw broader exceptions.
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14. Which of the following statements is true?

- A. Static polymorphism is achieved through method overriding.
 - B. Dynamic polymorphism is achieved through method overloading.
 - C. Overloading methods can have different parameter lists.
 - D. Overriding methods must have different return types.
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15. What will happen if a method in the subclass throws a broader exception than the method in the parent class?

- A. The code will compile and run successfully.
- B. The code will compile but throw a `ClassCastException` at runtime.
- C. The code will fail to compile.
- D. None of the above

Test – Programming Exercise Exam (25pts)

Static Polymorphism: Method Overloading

Write a Java program with a class `Calculator` that demonstrates **method overloading**.

- Create three methods named `add()` :
 - One method adds two integers.
 - Another adds three integers.
 - The third adds two double values.