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Programming Language Concepts

Quiz 1, II Semester, 2024–2025

30 January, 2025

1. Consider the following Java code skeleton.

```
public abstract class Vehicle{
    public boolean equals(Vehicle a){ ... }
}

public class Bike extends Vehicle{
    public boolean equals(Bike b){ ... }
}

public class Car extends Vehicle{
    public boolean equals(Vehicle m){ ... }
}

public class TestVehicles{
    public static void main(String[] args){
        Bike meteor = new Bike();
        Car phantom = new Car();
        Object op = phantom;
        Vehicle vm = meteor;
        ...
    }
}
```

Against each of the following, tick the `equals()` method that is invoked, among `Object.equals()`, `Vehicle.equals()`, `Bike.equals()` and `Car.equals()`.

(a) <code>op.equals(phantom);</code>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) <code>vm.equals(meteor);</code>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) <code>meteor.equals(phantom);</code>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) <code>phantom.equals(meteor);</code>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Consider the following Java code fragment.

```
public class CreditCard {...}
public class ChipCard extends CreditCard{...
    // Adds a new instance variable chip_id of type int
    // and defines a new method readChip() that returns an int
}
```

```
ChipCard[] chips = new ChipCard[10];
CreditCard[] cards = chips;
```

For each of the following statements, select whether the statement is legal, generates a compile-time error, or generates a run-time error.

(a) <code>cards[4] = new CreditCard();</code>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) <code>cards[7] = new ChipCard();</code>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) <code>int v = chips[3].readChip();</code>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) <code>int v = cards[8].readChip();</code>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>