

Exam A

QUESTION 1

Select and Place:

Place the Types in one of the Type columns, and the Relationships in the Relationship column, to define appropriate has-a and is-a relationships.

Type	Relationship	Type	Relationships	Types
Place here	Place here	Animal	is-a	Dog
Forest	Place here	Place here	has-a	Side
Rectangle	Place here	Place here		Tail
Place here	Place here	Programming Book		Square
				Tree
				Book
				Java Book
				Pen

Correct Answer:

Place the Types in one of the Type columns, and the Relationships in the Relationship column, to define appropriate has-a and is-a relationships.

Type	Relationship	Type	Relationships	Types
Dog	is-a	Animal	is-a	Dog
Forest	has-a	Tree	has-a	Side
Rectangle	has-a	Side		Tail
Java Book	is-a	Programming Book		Square
				Tree
				Book
				Java Book
				Pen

QUESTION 2

Place the Relations on their corresponding Implementation Structures. Note: Not all implementation Structures will be used.

Select and Place:

Implementation Structures		Relations
<pre>class A { List b; }</pre>	<pre>class A extends B,C { }</pre>	Car is a Vehicle and Car is a Collectable
<pre>class A { }</pre>	<pre>class A { B b; C c; }</pre>	Car has a SteeringWheel
<pre>class A { B b; }</pre>	<pre>class A implements B,C { }</pre>	Car has Wheels
<pre>class A extends B { }</pre>		Mini is a Car
		Car is an Object

Correct Answer:

Implementation Structures		Relations
Car has Wheels	<pre>class A extends B,C { }</pre>	
Car is an Object	<pre>class A { B b; C c; }</pre>	
Car has a SteeringWheel	Car is a Vehicle and Car is a Collectable	
Mini is a Car		

QUESTION 3

Given:

```
class Mammal {
}

class Raccoon extends Mammal {
    Mammal m = new Mammal();
}
```

```
class BabyRaccoon extends Mammal {  
}
```

Which four statements are true? (Choose four.)

- A. Raccoon is-a Mammal.
- B. Raccoon has-a Mammal.
- C. BabyRaccoon is-a Mammal.
- D. BabyRaccoon is-a Raccoon.
- E. BabyRaccoon has-a Mammal.
- F. BabyRaccoon is-a BabyRaccoon.

Correct Answer: ABCF

QUESTION 4

Which four statements are true? (Choose four.)

- A. Has-a relationships should never be encapsulated.
- B. Has-a relationships should be implemented using inheritance.
- C. Has-a relationships can be implemented using instance variables.
- D. Is-a relationships can be implemented using the extends keyword.
- E. Is-a relationships can be implemented using the implements keyword.
- F. The relationship between Movie and Actress is an example of an is-a relationship.
- G. An array or a collection can be used to implement a one-to-many has-a relationship.

Correct Answer: CDEG

QUESTION 5

Which Man class properly represents the relationship "Man has a best friend who is a Dog"?

- A. `class Man extends Dog { }`
- B. `class Man implements Dog { }`
- C. `class Man { private BestFriend dog; }`
- D. `class Man { private Dog bestFriend; }`
- E. `class Man { private Dog<bestFriend>; }`
- F. `class Man { private BestFriend<dog>; }`

Correct Answer: D

QUESTION 6

Given:

```
interface Jumper { public void jump(); }  
  
class Animal {}  
  
class Dog extends Animal {  
    Tail tail;  
}  
  
class Beagle extends Dog implements Jumper{  
    public void jump() {}  
}  
  
class Cat implements Jumper{  
    public void jump() {}  
}
```

Which three are true? (Choose three.)

- A. Cat is-a Animal
- B. Cat is-a Jumper
- C. Dog is-a Animal
- D. Dog is-a Jumper
- E. Cat has-a Animal
- F. Beagle has-a Tail
- G. Beagle has-a Jumper

Correct Answer: BCF

QUESTION 7

Given that: Gadget has-a Sprocket and Gadget has-a Spring and Gadget is-a Widget and Widget has-a Sprocket Which two code fragments represent these relationships? (Choose two.)

- A.

```
class Widget {
    Sprocket s;
}

class Gadget extends Widget {
    Spring s;
}
```
- B.

```
class Widget {
}

class Gadget extends Widget {
    Spring s1;
    Sprocket s2;
}
```
- C.

```
class Widget {
    Sprocket s1;
    Spring s2;
}

class Gadget extends Widget {
}
```
- D.

```
class Gadget {
    Spring s;
}

class Widget extends Gadget {
    Sprocket s;
}
```
- E.

```
class Gadget {
}

class Widget extends Gadget {
    Sprocket s1;
    Spring s2;
}
```
- F.

```
class Gadget {
    Spring s1;
    Sprocket s2;
}

class Widget extends Gadget {
}
```

Correct Answer: AC

QUESTION 8

Given:

```

class Thingy { Meter m = new Meter(); }

class Component { void go() { System.out.print("c"); } }

class Meter extends Component { void go() { System.out.print("m"); } }

class DeluxeThingy extends Thingy {
    public static void main(String[] args) {
        DeluxeThingy dt = new DeluxeThingy();
        dt.m.go();
        Thingy t = new DeluxeThingy();
        t.m.go();
    }
}

```

Which two are true? (Choose two.)

- A. The output is mm.
- B. The output is mc.
- C. Component is-a Meter.
- D. Component has-a Meter.
- E. DeluxeThingy is-a Component.
- F. DeluxeThingy has-a Component.

Correct Answer: AF

QUESTION 9

A company has a business application that provides its users with many different reports: receivables reports, payables reports, revenue projects, and so on. The company has just purchased some new, state-of-the-art, wireless printers, and a programmer has been assigned the task of enhancing all of the reports to use not only the company's old printers, but the new wireless printers as well. When the programmer starts looking into the application, the programmer discovers that because of the design of the application, it is necessary to make changes to each report to support the new printers. Which two design concepts most likely explain this situation? (Choose two.)

- A. Inheritance
- B. Low cohesion
- C. Tight coupling
- D. High cohesion
- E. Loose coupling
- F. Object immutability

Correct Answer: BC

QUESTION 10

A team of programmers is reviewing a proposed API for a new utility class. After some discussion, they realize that they can reduce the number of methods in the API without losing any functionality. If they implement the new design, which two OO principles will they be promoting?

- A. Looser coupling
- B. Tighter coupling
- C. Lower cohesion
- D. Higher cohesion
- E. Weaker encapsulation
- F. Stronger encapsulation

Correct Answer: AD

QUESTION 11

A company that makes Computer Assisted Design (CAD) software has, within its application, some utility classes that are used to perform 3D rendering tasks. The company's chief scientist has just improved the performance of one of the utility classes' key rendering algorithms, and has assigned a programmer to replace the old algorithm with the new algorithm. When the programmer begins researching the utility classes, she is happy to discover that the algorithm to be replaced exists in only one class. The programmer reviews that class's API, and replaces the old algorithm with the new algorithm, being careful that her changes adhere strictly to the class's API. Once testing has begun, the programmer discovers that other classes that use the class she changed are no longer working properly. What design flaw is most likely the cause of these new bugs?

- A. Inheritance
- B. Tight coupling
- C. Low cohesion
- D. High cohesion
- E. Loose coupling
- F. Object immutability

Correct Answer: B

QUESTION 12

A team of programmers is involved in reviewing a proposed design for a new utility class. After some discussion, they realize that the current design allows other classes to access methods in the utility class that should be accessible only to methods within the utility class itself. What design issue has the team discovered?

- A. Tight coupling
- B. Low cohesion
- C. High cohesion
- D. Loose coupling
- E. Weak encapsulation
- F. Strong encapsulation

Correct Answer: E