**Q1). Which of the following statements are true?**

Select the two correct answers.

(a) In Java, the **extends** clause is used to specify the inheritance relationship.

(b) The subclass of a non-abstract class can be declared as **abstract**.

(c) All members of the superclass are inherited by the subclass.

(d) A **final** class can be **abstract**.

(e) A class in which all the members are declared **private** cannot be declared as

**public**.

**Q2). Which of the following statements are true?**

Select the two correct answers.

(a) A class can be extended by only one class.

(b) Every Java object has a public method named equals.

(c) Every Java object has a public method named length.

(d) A class can extend any number of classes.

(e) A non-final class can be extended by any number of classes.

**Q3). Given the following classes and declarations, which statements are true?**

// Classes

**class** Foo {

**private int** i;

**public void** f() { /\* … \*/ }

**public void** g() { /\* … \*/ }

}

**class** Bar **extends** Foo {

**public int** j;

**public void** g() { /\* … \*/ }

}

// Declarations:

Foo a = **new** Bar();

Bar b = **new** Bar();

Select the three correct answers.

(a) The Bar class is a subclass of Foo.

(b) The statement b.f(); is legal.

(c) The statement a.j = 5; is legal.

(d) The statement a.g(); is legal.

(e) The statement b.i = 3; is legal.

**Q4). Given classes A, B, and C, where B extends A, and C extends B, and where all classes implement the instance method void doIt(), how can the doIt() method in A be called from an instance method in C?**

Select the one correct answer.

(a) doIt();

(b) super.doIt();

(c) super.super.doIt();

(d) this.super.doIt();

(e) A.this.doIt();

(f) ((A) this).doIt();

(g) It is not possible.

**Q5). What would be the result of compiling and running the following program?**

**public class** UserClass {

**public static void** main(String[] args) {

B b = new C();

System.out.println(b.max(13, 29));

}

}

**class** A {

**int** max(**int** x, **int** y) { **if** (x > y) **return** x; **else return** y; }

}

**class** B **extends** A {

**int** max(**int** x, **int** y) { **return super**.max(y, x) - 10; }

}

**class** C **extends** B {

**int** max(**int** x, **int** y) { **return super**.max(x + 10, y + 10); }

}

Select the one correct answer.

(a) The code will fail to compile.

(b) The code will compile, but throw an exception at runtime.

(c) The code will compile, and print 13 at runtime.

(d) The code will compile, and print 23 at runtime.

(e) The code will compile, and print 29 at runtime.

(f) The code will compile, and print 39 at runtime.

**Q6). Which is the simplest expression that can be inserted at (1), so that the program prints the value of the text field from the Message class?**

// File: MyClass.java

**class** Message {

// The message that should be printed:

String text = “Hello, world!”;

}

**class** MySuperclass {

Message msg = **new** Message();

}

**public class** MyClass **extends** MySuperclass {

**public static void** main(String[] args) {

MyClass object = new MyClass();

object.print();

}

**public void** print() {

System.out.println(/\* ***insert the simplest expression*** \*/);

}

}

Select the one correct answer.

(a) text

(b) Message.text

(c) msg.text

(d) this.msg.text

(e) super.msg.text

(f) this.super.msg.text

**Q7). What would be the result of compiling and running the following program?**

**class** Vehicle {

**static public** String getModelName() { **return** “Volvo”; }

**public long** getRegNo() { **return** 12345; }

}

**class** Car **extends** Vehicle {

**static public** String getModelName() { **return** “Toyota”; }

**public long** getRegNo() { **return** 54321; }

}

**public class** TakeARide {

**public static void** main(String[] args) {

Car c = **new** Car();

Vehicle v = c;

System.out.println(“|” + v.getModelName() +

“|” + c.getModelName() +

”|” + v.getRegNo() +

“|” + c.getRegNo() + “|”);

}

}

Select the one correct answer.

(a) The code will fail to compile.

(b) The code will compile, and print |Toyota|Volvo|12345|54321| at runtime.

(c) The code will compile, and print |Volvo|Toyota|12345|54321| at runtime.

(d) The code will compile, and print |Toyota|Toyota|12345|12345| at runtime.

(e) The code will compile, and print |Volvo|Volvo|12345|54321| at runtime.

(f) The code will compile, and print |Toyota|Toyota|12345|54321| at runtime.

(g) The code will compile, and print |Volvo|Toyota|54321|54321| at runtime.

**Q8). Which constructors can be inserted at (1) in MySub without causing a compile time error?**

**class** MySuper {

**int** number;

MySuper(**int** i) { number = i; }

}

**class** MySub **extends** MySuper {

**int** count;

MySub(**int** count, **int** num) {

super(num);

**this**.count = count;

}

// (1) INSERT CONSTRUCTOR HERE

}

Select the one correct answer.

(a) MySub() {}

(b) MySub(int count) { **this**.count = count; }

(c) MySub(int count) { **super**(); **this**.count = count; }

(d) MySub(int count) { **this**.count = count; **super**(count);}

(e) MySub(int count) { **this**(count, count); }

(f) MySub(int count) { **super**(count); **this**(count, 0); }

**Q9). Which of the following statements is true?**

Select the one correct answer.

(a) A super() or this() call must always be provided explicitly as the first

statement in the body of a constructor.

(b) If both a subclass and its superclass do not have any declared constructors, the implicit default constructor of the subclass will call super() when run.

(c) If neither super() nor this() is specified as the first statement in the body

of a constructor, this() will implicitly be inserted as the first statement.

(d) If super() is the first statement in the body of a constructor, this() can be

declared as the second statement.

(e) Calling super() as the first statement in the body of a constructor of a

subclass will always work, since all superclasses have a default constructor.

**Q10). What will the following program print when run?**

**public class** MyClass {

**public static void** main(String[] args) {

B b = **new** B(“Test”);

}

}

**class** A {

A() { **this**(“1”, “2”); }

A(String s, String t) { **this**(s + t); }

A(String s) { System.out.println(s); }

}

**class** B **extends** A {

B(String s) { System.out.println(s); }

B(String s, String t) { **this**(t + s + “3”); }

B() { **super**(“4”); };

}

Select the one correct answer.

(a) It will just print Test.

(b) It will print Test followed by Test.

(c) It will print 123 followed by Test.

(d) It will print 12 followed by Test.

(e) It will print 4 followed by Test.

**Q11). Which statement about the following program is true?**

**public class** MyClass {

**public static void** main(String[] args) {

A[] arrA;

B[] arrB;

arrA = **new** A[10];

arrB = **new** B[20];

arrA = arrB; // (1)

arrB = (B[]) arrA; // (2)

arrA = **new** A[10];

arrB = (B[]) arrA; // (3)

}

}

**class** A {}

**class** B **extends** A {}

Select the one correct answer.

(a) The program will fail to compile because of the assignment at (1).

(b) When run, the program will throw a java.lang.ClassCastException

in the assignment at (2).

(c) When run, the program will throw a java.lang.ClassCastException

in the assignment at (3).

(d) The program will compile and run without errors, even if the cast operator

(B[]) in the statements at (2) and (3) is removed.

(e) The program will compile and run without errors, but will not do so if the cast operator (B[]) in statements at (2) and (3) is removed.

**Q12). Which statements will cause a compile-time error in the following code?**

**public class** MyClass {

**public static void** main(String[] args) {

MyClass a;

MySubclass b;

a = **new** MyClass(); // (1)

b = **new** MySubclass(); // (2)

a = b; // (3)

b = a; // (4)

a = **new** MySubclass(); // (5)

b = **new** MyClass(); // (6)

}

}

**class** MySubclass **extends** MyClass {}

Select the two correct answers.

(a) (1)

(b) (2)

(c) (3)

(d) (4)

(e) (5)

(f) (6)

**Q13). Given the following class and reference declarations, what can be said about the statement y = (Sub) x?**

// Class declarations:

**class** Super {}

**class** Sub **extends** Super {}

// Reference declarations:

**Super** x = null;

**Sub** y = null;

Select the one correct answer.

(a) It is illegal at compile time.

(b) It is legal at compile time, but might be illegal at runtime.

(c) It is definitely legal at runtime, but the cast operator (Sub) is not strictly

needed.

(d) It is definitely legal at runtime, and the cast operator (Sub) is needed.

**Q14). Given three classes A, B, and C, where B is a subclass of A, and C is a subclass of B, which one of these boolean expressions is true only when the reference o refers to an object of class B, and not to an object of class A or class C?**

Select the one correct answer.

(a) (o **instanceof** B) && (!(o **instanceof** A))

(b) (o **instanceof** B) && (!(o **instanceof** C))

(c) !((o **instanceof** A) || (o **instanceof** B))

(d) (o **instanceof** B)

(e) (o **instanceof** B) && !((o **instanceof** A) || (o **instanceof** C))

**??Q15). What is the result of compiling and running the following program?**

**class** YingYang {

**void** yingyang(Integer i) {

System.out.println(“Integer: ” + i);

}

**void** yingyang(Integer[] ints) {

System.out.println(“Integer[]: ” + ints[0]);

}

**void** yingyang(Integer… ints) {

System.out.println(“Integer…: ” + ints[0]);

}

}

**public class** RQ800A50 {

**public static void** main(String[] args) {

YingYang yy = **new** YingYang();

yy.yingyang(10);

yy.yingyang(10,12);

yy.yingyang(**new** Integer[] {10, 20});

yy.yingyang(**new** Integer(10), new Integer(20));

}

}

Select the one correct answer.

(a) The program will not compile because of errors.

(b) The program will compile, but throw an exception at runtime.

(c) The program will compile and print:

Integer: 10

Integer…: 10

Integer…: 10

Integer…: 10

(d) The program will compile and print:

Integer: 10

Integer…: 10

Integer[]: 10

Integer…: 10

**??Q16). What will be the result of compiling and running the following program?**

**public class** RQ800A20 {

**static void** compute(**int**… ia) { // (1)

System.out.print(“|”);

**for**(**int** i : ia) {

System.out.print(i + “|”);

}

System.out.println();

}

**static void** compute(**int**[] ia1, **int**… ia2) { // (2)

compute(ia1);

compute(ia2);

}

**static void** compute(**int**[] ia1, **int**[]… ia2d) { // (3)

**for**(**int**[] ia : ia2d) {

compute(ia);

}

}

**public static void** main(String[] args) {

compute(**new** **int**[] {10, 11}, **new** **int**[] {12, 13, 14}); // (4)

compute(15, 16); // (5)

compute(**new** **int**[] {17, 18}, **new int**[][] {{19}, {20}}); //(6)

compute(**null**, **new** **int**[][] {{21}, {22}}); // (7)

}

}

Select the one correct answer.

(a) The program does not compile because of errors in one or more calls to the

compute() method.

(b) The program compiles, but throws a NullPointerException when run.

(c) The program compiles and prints:

|10|11|

|12|13|14|

|15|16|

|19|

|20|

|21|

|22|

(d) The program compiles and prints:

|12|13|14|

|15|16|

|10|11|

|19|

|20|

|21|

|22|