

1.1 Which statement about methods is true?

Select the one correct answer.

- (a) A method is an implementation of an abstraction.
- (b) A method is an attribute defining the property of a particular abstraction.
- (c) A method is a category of objects.
- (d) A method is an operation defining the behavior for a particular abstraction.
- (e) A method is a blueprint for making operations.

1.2 Which statement about objects is true?

Select the one correct answer.

- (a) An object is what classes are instantiated from.
- (b) An object is an instance of a class.
- (c) An object is a blueprint for creating concrete realization of abstractions.
- (d) An object is a reference.
- (e) An object is a variable.

1.3 Which is the first line of a constructor declaration in the following code?

```
public class Counter { // (1)
    int current, step;
    public Counter(int startValue, int stepValue) { // (2)
        setCurrent(startValue);
        setStep(stepValue);
    }
    public int getCurrent() { return current; } // (3)
    public void setCurrent(int value) { current=value;} // (4)
    public void setStep(int stepValue) { step = stepValue; } // (5)
}
```

Select the one correct answer.

- (a) (1)
- (b) (2)
- (c) (3)
- (d) (4)
- (e) (5)

1.4 Given that Thing is a class, how many objects and how many reference variables are created by the following code?

```
Thing item, stuff;
item = new Thing();
Thing entity = new Thing();
```

Select the two correct answers.

- (a) One object is created.
- (b) Two objects are created.
- (c) Three objects are created.
- (d) One reference variable is created.
- (e) Two reference variables are created.
- (f) Three reference variables are created.

1.5 Which statement about instance members is true?

Select the one correct answer.

- (a) An instance member is also called a static member.
- (b) An instance member is always a field.
- (c) An instance member is never a method.
- (d) An instance member belongs to an instance, not to the class as a whole.
- (e) An instance member always represents an operation.

1.6 How do objects communicate in Java?

Select the one correct answer.

- (a) They communicate by modifying each other's fields.
- (b) They communicate by modifying the static variables of each other's classes.
- (c) They communicate by calling each other's instance methods.
- (d) They communicate by calling static methods of each other's classes.

1.7 Given the following code, which statements are true?

```
class A { int value1; }
class B extends A { int value2;}
```

Select the two correct answers.

- (a) Class A extends class B.
- (b) Class B is the superclass of class A.
- (c) Class A inherits from class B.
- (d) Class B is a subclass of class A.
- (e) Objects of class A have a field named value2.
- (f) Objects of class B have a field named value1.

1.8 Which command from the JDK should be used to compile the following source code contained in a file named SmallProg.java?

```
public class SmallProg {
    public static void main(String[] args) {
        System.out.println("Good luck!");
    }
}
```

Select the one correct answer.

- (a) java SmallProg
- (b) javac SmallProg
- (c) java SmallProg.java
- (d) javac SmallProg.java
- (e) java SmallProg main

1.9 Which command from the JDK should be used to execute the main() method of a class named SmallProg?

Select the one correct answer.

- (a) java SmallProg
- (b) javac SmallProg
- (c) java SmallProg.java
- (d) java SmallProg.class
- (e) java SmallProg.main()

2.1 Which of the following is not a legal identifier?

Select the one correct answer.

- (a) a2z
- (b) ödipus
- (c) 52pickup
- (d) _class
- (e) ca\$h

2.2 Which statement is true?

Select the one correct answer.

- (a) new and delete are keywords in the Java language.
- (b) try, catch, and thrown are keywords in the Java language.
- (c) static, unsigned, and long are keywords in the Java language.
- (d) exit, class, and while are keywords in the Java language.
- (e) return, goto, and default are keywords in the Java language.
- (f) for, while, and next are keywords in the Java language.

2.3 Which statement about the following comment is true?

```
/* // */
```

Select the one correct answer.

- (a) The comment is not valid. The multiple-line comment (`/* ... */`) does not end correctly, since the comment-end sequence `*/` is a part of the single-line comment (`// ...`).
- (b) It is a completely valid comment. The `//` part is ignored by the compiler.
- (c) This combination of comments is illegal, and will result in a compiler time error.

2.4 Which of the following do not denote a primitive data value in Java?

Select the two correct answers.

- (a) "t"
- (b) 'k'
- (c) 50.5F
- (d) "hello"
- (e) false

2.5 Which of the following primitive data types are not integer types?

Select the three correct answers.

- (a) boolean
- (b) byte
- (c) float
- (d) short
- (e) double

2.6 Which integral type in Java has the exact range from -2^{31} to $2^{31}-1$, inclusive?

Select the one correct answer.

- (a) byte
- (b) short
- (c) int
- (d) long
- (e) char

2.7 Which declarations are valid?

Select the three correct answers.

- (a) `char a = '\u0061';`
- (b) `char 'a' = 'a';`
- (c) `char \u0061 = 'a';`
- (d) `ch\u0061r a = 'a';`
- (e) `ch'a'r a = 'a';`

2.8 Given the following code within a method, which statement is true?

```
int a, b;
```

```
b = 5;
```

Select the one correct answer.

- (a) Local variable a is not declared.
- (b) Local variable b is not declared.
- (c) Local variable a is declared but not initialized.
- (d) Local variable b is declared but not initialized.
- (e) Local variable b is initialized but not declared.

2.9 In which of these variable declarations will the variable remain uninitialized unless it is explicitly initialized?

Select the one correct answer.

- (a) Declaration of an instance variable of type `int`.
- (b) Declaration of a static variable of type `float`.
- (c) Declaration of a local variable of type `float`.
- (d) Declaration of a static variable of type `Object`.
- (e) Declaration of an instance variable of type `int[]`.

2.10 What will be the result of compiling and running the following program?

```
public class Init {
    String title;
    boolean published;
    static int total;
    static double maxPrice;
    public static void main(String[] args) {
        Init initMe = new Init();
        double price;
        if (true)
            price = 100.00;
        System.out.println("|" + initMe.title + "|" + initMe.published +
            "|" + Init.total + "|" + Init.maxPrice + "|" + price + "|");
    }
}
```

Select the one correct answer.

- a) The program will fail to compile.
- b) The program will compile, and print `|null|false|0|0.0|0.0|`, when run.
- c) The program will compile, and print `|null|true|0|0.0|100.0|`, when run.
- d) The program will compile, and print `| |false|0|0.0|0.0|`, when run.
- e) The program will compile, and print `|null|false|0|0.0|100.0|`, when run.

3.1 Which one of these declarations is a valid method declaration?

Select the one correct answer.

- (a) void method1 { /* ... */ }
- (b) void method2() { /* ... */ }
- (c) void method3(void) { /* ... */ }
- (d) method4() { /* ... */ }
- (e) method5(void) { /* ... */ }

3.2 Which statements, when inserted at (1), will not result in compile-time errors?

```
public class ThisUsage {
    int planets;
    static int suns;
    public void gaze() {
        int i;
        // (1) INSERT STATEMENT HERE
    }
}
```

- Select the three correct answers.
- (a) i = this.planets;
 - (b) i = this.suns;
 - (c) this = new ThisUsage();
 - (d) this.i = 4;
 - (e) this.suns = planets;

3.3 Given the following pairs of method declarations, which statements are true?

```
void fly(int distance) {}
int fly(int time, int speed) { return time*speed; }
void fall(int time) {}
int fall(int distance) { return distance; }
void glide(int time) {}
void Glide(int time) {}
```

Select the two correct answers.

- (a) The first pair of methods will compile, and overload the method name fly .
- (b) The second pair of methods will compile, and overload the method name fall.
- (c) The third pair of methods will compile, and overload the method name glide.
- (d) The second pair of methods will not compile.
- (e) The third pair of methods will not compile.

3.4 Given a class named Book, which one of these constructor declarations is valid for the class Book?

Select the one correct answer.

- (a) Book(Book b) {}
- (b) Book Book() {}
- (c) private final Book() {}
- (d) void Book() {}
- (e) public static void Book(String[] args) {}
- (f) abstract Book() {}

3.5 Which statements are true?

Select the two correct answers.

- (a) A class must define a constructor.
- (b) A constructor can be declared private.
- (c) A constructor can return a value.
- (d) A constructor must initialize all fields when a class is instantiated.
- (e) A constructor can access the non-static members of a class.

3.6 What will be the result of compiling the following program?

```
public class MyClass {
    long var;
    public void MyClass(long param) { var = param; } // (1)
    public static void main(String[] args) {
        MyClass a, b;
        a = new MyClass(); // (2)
        b = new MyClass(5); // (3)
    }
}
```

Select the one correct answer.

- (a) A compilation error will occur at (1), since constructors cannot specify a return value.
- (b) A compilation error will occur at (2), since the class does not have a default constructor.
- (c) A compilation error will occur at (3), since the class does not have a constructor that takes one argument of type int.
- (d) The program will compile without errors.

3.7 Which statements about the enum type are true?

Select the three correct answers.

- (a) An enum type is a subclass of the abstract class java.lang.Enum, hence it is Comparable and Serializable.
- (b) An enum type can implement interfaces.
- (c) We can instantiate an enum type using the new operator.
- (d) An enum type can define constructors.
- (e) We can explicitly use the extend clause to extend an enum type.
- (f) Enum types do not inherit members from the Object class.

3.8 What will be the result of attempting to compile and run the following code?

```
public enum Drill {
    ATTENTION("Attention!"), EYES_RIGHT("Eyes right!"),
    EYES_LEFT("Eyes left!"), AT_EASE("At ease!");
    private String command;
    Drill(String command) {
        this.command = command;
    }
    public static void main(String[] args) {
        System.out.println(ATTENTION); // (1)
        System.out.println(AT_EASE); // (2)
    }
}
```

Select the one correct answer.

- (a) The code compiles, but reports a ClassNotFoundException when run, since an enum type cannot be run as a standalone application.
- (b) The compiler reports errors in (1) and (2), as the constants must be qualified by the enum type name Drill.
- (c) The compiler reports errors in (1) and (2), as the constants cannot be accessed in a static context.
- (d) The code compiles and prints: ATTENTION
AT_EASE
- (e) The code compiles and prints: Attention!
At ease!
- (f) None of the above.

3.9 What will be the result of compiling and running the following code?

```
import java.util.Arrays;
public enum Priority {
    ONE(1) { public String toString() { return "LOW"; } }, // (1)
    TWO(2),
    THREE(3) { public String toString() { return "NORMAL"; } }, // (2)
    FOUR(4),
    FIVE(5) { public String toString() { return "HIGH"; } }; // (3)
    private int pValue;
    Priority(int pValue) {
        this.pValue = pValue;
    }
    public static void main(String[] args) {
        System.out.println(Arrays.toString(Priority.values()));
    }
}
```

Select the one correct answer.

- (a) The code compiles, but reports a `ClassNotFoundException` when run, since an enum type cannot be run as a standalone application.
- (b) The compiler reports syntax errors in (1), (2), and (3).
- (c) The code compiles and prints:
[LOW, TWO, NORMAL, FOUR, HIGH]
- (d) The code compiles and prints:
[ONE, TWO, THREE, FOUR, HIGH]
- (e) None of the above.

3.10 Which statement about the following program is true?

```
public enum Scale {
    GOOD('C'), BETTER('B'), BEST('A');
    private char grade;
    Scale(char grade) {
        this.grade = grade;
    }
    abstract public char getGrade();
    public static void main (String[] args) {
        System.out.println (GOOD.getGrade()); // (1)
    }
}
```

Select the one correct answer.

- (a) Since the enum type declares an abstract method, the enum type must be declared as abstract.
- (b) The method call `GOOD.getGrade()` in (1) can be written without the enum type name.
- (c) An enum type cannot declare an abstract method.
- (d) An enum type can declare an abstract method, but each enum constant must provide an implementation.

3.11 What will be the result of compiling and running the following code?

```
public enum TrafficLight {
    RED("Stop"), YELLOW("Caution"), GREEN("Go");
    private String action;
    TrafficLight(String action) {
        this.action = action;
    }
}
```

```
public static void main(String[] args) {
    TrafficLight green = new TrafficLight("Go");
    System.out.println(GREEN.equals(green));
}
}
```

Select the one correct answer.

- (a) The code will compile and print: true.
- (b) The code will compile and print: false.
- (c) The code will not compile, as an enum type cannot be instantiated.
- (d) An enum type does not have the `equals()` method.

3.12 Given the following program:

```
public enum Scale2 {
    GOOD('C') { public char getGrade() { return grade; } },
    BETTER('B') { public char getGrade() { return grade; } },
    BEST('A') { public char getGrade() { return grade; } };
    private char grade;
    Scale2(char grade) {
        this.grade = grade;
    }
    // (1) INSERT CODE HERE
    public static void main (String[] args) {
        System.out.println(GOOD.getGrade());
    }
}
```

Which code, when inserted at (1), will make the program print C?

Select the two correct answers.

- (a) `public char getGrade() { return grade; }`
- (b) `public int getGrade() { return grade; }`
- (c) `abstract public int getGrade();`
- (d) `abstract public char getGrade();`

3.13 Given the following program:

```
enum Scale3 {
    GOOD(Grade.C), BETTER(Grade.B), BEST(Grade.A);
    enum Grade {A, B, C}
    private Grade grade;
    Scale3(Grade grade) {
        this.grade = grade;
    }
    public Grade getGrade() { return grade; }
}
public class Scale3Client {
    public static void main (String[] args) {
        System.out.println(/* (1) INSERT CODE HERE */);
    }
}
```

Which code, when inserted at (1), will make the program print true?

Select the four correct answers.

- (a) `Scale3.GOOD.getGrade() != Scale3.Grade.C`
- (b) `Scale3.GOOD.getGrade().compareTo(Scale3.Grade.C) != 0`
- (c) `Scale3.GOOD.getGrade().compareTo(Scale3.Grade.A) > 0`
- (d) `Scale3.GOOD.compareTo(Scale3.BEST) > 0`
- (e) `Scale3.GOOD.getGrade() instanceof Scale3.Grade`
- (f) `Scale3.GOOD instanceof Scale3`
- (g) `Scale3.GOOD.getGrade().toString().equals(Scale3.Grade.C.toString())`

3.14 What will be the result of compiling and running the following code?

```
public enum Scale5 {
    GOOD, BETTER, BEST;
    public char getGrade() {
        char grade = '\u0000';
        switch(this){
            case GOOD: grade = 'C'; break;
            case BETTER: grade = 'B'; break;
            case BEST: grade = 'A'; break;
        }
        return grade;
    }
    public static void main (String[] args) {
        System.out.println(GOOD.getGrade());
    }
}
```

Select the one correct answer.

- (a) The program will not compile, as the switch expression is not compatible with the case labels.
- (b) The program will not compile, as enum constants cannot be used as case labels.
- (c) The case labels must be qualified with the enum type name.
- (d) The program compiles, and when run, prints: C
- (e) The program compiles, and when run, prints: GOOD
- (f) None of the above.

3.15 Given the following code:

```
package p1;
enum March {LEFT, RIGHT} // (1)
public class Defence {
    enum March {LEFT, RIGHT} // (2)
    static enum Military {
        INFANTRY, AIRFORCE;
        enum March {LEFT, RIGHT} // (3)
    }
    class Secret {
        enum March {LEFT, RIGHT} // (4)
    }
    static class Open {
        enum March {LEFT, RIGHT} // (5)
    }
    public static void declareWar() {
        enum March {LEFT, RIGHT} // (6)
    }
    public void declarePeace() {
        enum March {LEFT, RIGHT} // (7)
    }
}
```

Which enum declarations are not legal?

Select the three correct answers.

- (a) The enum declaration at (1) is not legal.
- (b) The enum declaration at (2) is not legal.
- (c) The enum declaration at (3) is not legal.
- (d) The enum declaration at (4) is not legal.
- (e) The enum declaration at (5) is not legal.
- (f) The enum declaration at (6) is not legal.
- (g) The enum declaration at (7) is not legal.

3.16 Given the following code:

```
public enum Direction {
    EAST, WEST, NORTH, SOUTH;
    public static void main (String[] args) {
        // (1) INSERT LOOP HERE
    }
}
```

Which loops, when inserted independently at (1), will give the following output:

EAST
WEST
NORTH
SOUTH

Select the three correct answers.

- (a) for (Direction d : Direction.values()) { System.out.println(d); }
- (b) for (Direction d : Direction.values()) { System.out.println(d.name()); }
- (c) for (String name : Direction.names()) { System.out.println(name); }
- (d) for (Direction d : java.util.Arrays.asList(Direction.values())) { System.out.println(d); }
- (e) for (Direction d : java.util.Arrays.asList(Direction.class)) { System.out.println(d); }

3.17 What will be the result of compiling and running the following code?

```
enum Rank {
    FIRST(20), SECOND(0), THIRD(8);
    Rank(int value) {
        System.out.print(value);
    }
}
public class EnumCreation {
    public static void main (String[] args) {
        System.out.println("\n" + Rank.values().length);
    }
}
```

Select the one correct answer.

- (a) The program will compile and print: 3
- (b) The program will compile and print: 2008
- (c) The program will compile. When run, it will print: 3
and throw an exception.
- (d) None of the above.

3.18 Given the following declaration, which expression returns the size of the array, assuming the array has been initialized?

int[] array;

Select the one correct answer.

- (a) array[].length()
- (b) array.length()
- (c) array[].length
- (d) array.length
- (e) array[].size()
- (f) array.size()

3.26 Which statements, when inserted at (1), will cause a compilation error?

```
public class ParameterUse {
    static void main(String[] args) {
        int a = 0;
        final int b = 1;
        int[] c = { 2 };
        final int[] d = { 3 };
        useArgs(a, b, c, d);
    }
    static void useArgs(final int a, int b, final int[] c, int[] d) {
        // (1) INSERT STATEMENT HERE.
    }
}
```

Select the two correct answers.

- (a) a++;
- (b) b++;
- (c) b = a;
- (d) c[0]++;
- (e) d[0]++;
- (f) c = d;

3.27 Which method declarations are valid declarations?

Select the three correct answers.

- (a) void compute(int... is) { }
- (b) void compute(int is...) { }
- (c) void compute(int... is, int i, String... ss) { }
- (d) void compute(String... ds) { }
- (e) void compute(String... ss, int len) { }
- (f) void compute(char[] ca, int... is) { }

3.28 Given the following code:

```
public class RQ800_40 {
    static void print(Object... obj) {
        System.out.println("Object...: " + obj[0]);
    }
    public static void main(String[] args) {
        // (1) INSERT METHOD CALL HERE.
    }
}
```

Which method call, when inserted at (1), will not result in the following output from the program:

Object...: 9

Select the one correct answer.

- (a) print("9", "1", "1");
- (b) print(9, 1, 1);
- (c) print(new int[] {9, 1, 1});
- (d) print(new Integer[] {9, 1, 1});
- (e) print(new String[] {"9", "1", "1"});
- (f) print(new Object[] {"9", "1", "1"});

3.29 What will be the result of compiling and running the following program?

```
public class RQ800_20 {
    static void compute(int... is) { // (1)
        System.out.print("|");
        for(int i : is) {
            System.out.print(i + "|");
        }
        System.out.println();
    }
    static void compute(int[] ia, int... is) { // (2)
        compute(ia);
        compute(is);
    }
    static void compute(int[] inta, int[]... is) { // (3)
        for(int[] ia : is) {
            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|
```

3.31 Which of the following are reserved keywords?

Select the three correct answers.

- (a) public
- (b) static
- (c) void
- (d) main
- (e) String
- (f) args

3.30 Which of these method declarations are valid declarations of the main() method that would be called by the JVM in order to start the execution of a Java application?

Select the three correct answers.

- (a) `static void main(String[] args) { /* ... */ }`
- (b) `public static int main(String[] args) { /* ... */ }`
- (c) `public static void main(String args) { /* ... */ }`
- (d) `final public static void main(String[] arguments) { /* ... */ }`
- (e) `public int main(Strings[] args, int argc) { /* ... */ }`
- (f) `static public void main(String args[]) { /* ... */ }`
- (g) `static public void main(String... args) { /* ... */ }`

3.32 Given the class

```
// File name: Args.java
public class Args {
    public static void main(String[] args) {
        System.out.println(args[0] + " " + args[args.length-1]);
    }
}
```

what would be the result of executing the following command line?

```
>java Args In politics stupidity is not a handicap
```

Select the one correct answer.

- (a) The program will throw an `ArrayIndexOutOfBoundsException`.
- (b) The program will print "java handicap".
- (c) The program will print "Args handicap".
- (d) The program will print "In handicap".
- (e) The program will print "Args a".
- (f) The program will print "In a".

3.33 Which statement about the following program is true?

```
class MyClass {
    public static void main(String[] args) {
        String[] numbers = { "one", "two", "three", "four" };
        if (args.length == 0) {
            System.out.println("no arguments");
        } else {
            System.out.println(numbers[ args.length ] + " arguments");
        }
    }
}
```

Select the one correct answer.

- (a) The program will fail to compile.
- (b) The program will throw a `NullPointerException` when run with no program arguments.
- (c) The program will print "no arguments" and "two arguments" when called with zero and three program arguments, respectively.
- (d) The program will print "no arguments" and "three arguments" when called with zero and three program arguments, respectively.
- (e) The program will print "no arguments" and "four arguments" when called with zero and three program arguments, respectively.
- (f) The program will print "one arguments" and "four arguments" when called with zero and three program arguments, respectively.