Introduction to Java Programming and Data Structures 12th edition Liang Test Bank

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Chapter 1 Introduction to Computers, Programs, and Java

Section 1.2 What is a Computer?
1. _____ is the physical aspect of the computer that can be seen.
a. Hardware
b. Software
c. Operating system
d. Application program
Key:a See the first paragraph in Section 1.2.

#
Section 1.2.1 What is a Computer?
2. _____ is the brain of a computer.
a. Hardware
b. CPU
c. Memory
d. Disk
Key:b See the first paragraph in Section 1.2.1.

#
3. The speed of the CPU may be measured in_____.
a. megabytes
b. gigabytes
c. megahertz
d. gigahertz
Key:cd See the third paragraph in Section 1.2.1. 1 megahertz equals 1 million pulses per second and 1 gigahertz is 1000 megahertz.

#
Section 1.2.2 Bits and Bytes
4. Why do computers use zeros and ones?
a. because combinations of zeros and ones can represent any numbers and characters.
b. because digital devices have two stable states and it is natural to use one state for 0 and the other for 1.
c. because binary numbers are simplest.
d. because binary numbers are the bases upon which all other number systems are built.
Key:b See the second paragraph in Section 1.2.2.

#
5. One byte has_____bits.
a. 4
b. 8
c. 12
d. 16
Key:b See the thrid paragraph in Section 1.2.2.

#
5. One gigabyte is approximately_____bytes.
a. 1 million
b. 10 million
c. 1 billion
d. 1 trillion
Key:c See the fifth paragraph in Section 1.2.2.

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#
Section 1.2.3 Memory
6. A program and its data must be moved into the computer's_____before they can be executed by the CPU.
a. memory
b. hard disk
c. CPU
d. CD-ROM
Key:a See the first paragraph in Section 1.2.3.

#
Section 1.2.4 Storage Devices
6. A computer's_____is volatile; that is, any information stored in it is lost when the system's power is turned off.
a. memory
b. hard disk
c. flash stick
d. CD-ROM
Key:a See the first paragraph in Section 1.2.4.

#
6. Which of the following are storage devices?
a. portable disk
b. hard disk
c. flash stick
d. CD-ROM
Key:abcd See the second paragraph in Section 1.2.4.

#
Section 1.2.5 Input and Output Devices
7. The_____specifies the number of pixels in horizontal and vertical dimensions of the display device.
a. screen resolution
b. pixel
c. dot pitch
d. monitor
Key:a See the third last paragraph in Section 1.2.5.

#
Section 1.2.6 Communications Devices
7. _____ is a device to connect a computer to a local area network (LAN).
a. Regular modem
b. DSL
c. Cable modem
d. NIC
Key:d See the bullet items in Section 1.2.6.

#
Section 1.3 Program Languages
8. _____ are instructions to the computer.
a. Hardware
b. Software
c. Programs
d. Keyboards
Key:bc See the Key Point in Section 1.3.

#

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9. Computer can execute the code in_____.
a. machine language
b. assembly language
c. high-level language
d. none of the above
Key:a See the first paragraph in Section 1.3.1.

#
10. _____ translates high-level language program into machine language program.
a. An assembler
b. A compiler
c. CPU
d. The operating system
Key:b See the first paragraph after Table 1.1 in Section 1.3.3.

#
Section 1.4 Operating Systems
11. _____ is an operating system.
a. Java
b. C++
c. Windows
d. Visual Basic
e. Ada
Key:c See the first paragraph in Section 1.4.

#
12. _____ is a program that runs on a computer to manage and control a computer's activities.
a. Operating system
b. Java
c. Modem
d. Interpreter
e. Compiler
Key:a See the first paragraph in Section 1.4.

#
Section 1.5 Java, World Wide Web, and Beyond
14. Due to security reasons, Java_____cannot run from a Web browser in the new version of Java.
a. applications
b. applets
c. servlets
d. Micro Edition programs
Key:b See the last paragraph in Section 1.5.

#
15. _____ is not an object-oriented programming language.
a. Java
b. C++
c. C
d. C#
e. Python

Key:c See Table 1.1 in Section 1.3.1.

#
16. _____ is interpreted.

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a. Java
b. C++
c. C
d. Ada
e. Pascal
Key:a See the second paragraph in Section 1.5.

#
17. _____ is architecture-neutral.
a. Java
b. C++
c. C
d. Ada
e. Pascal

Key:a See the second paragraph in Section 1.5.

#
Section 1.6 The Java Language Specification, API, JDK, and IDE
18. _____ is a technical definition of the language that includes the syntax and semantics of the Java programming language.

a. Java language specification
b. Java API
c. Java JDK
d. Java IDE
Key:a See the last paragraph in Section 1.6.

#
19. _____ contains predefined classes and interfaces for developing Java programs.
a. Java language specification
b. Java API
c. Java JDK
d. Java IDE
Key:b See the last paragraph in Section 1.6.

#
20. _____ consists of a set of separate programs for developing and testing Java programs, each of which is invoked from a command line.
a. Java language specification
b. Java API
c. Java JDK
d. Java IDE
Key:c See the last paragraph in Section 1.6.

#
21. _____ provides an integrated development environment (IDE) for rapidly developing Java programs. Editing, compiling, building, debugging, and online help are integrated in one graphical user interface.
a. Java language specification
b. Java API
c. Java JDK
d. Java IDE
Key:d See the last paragraph in Section 1.6.

#

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22. The main method header is written as:
a. public static void main(string[] args)
b. public static void Main(String[] args)
c. public static void main(String[] args)
d. public static main(String[] args)
e. public void main(String[] args)
Key:c In A, string should be spelled String with S in uppercase. In B, Main should be spelled main in lowercase. In D, the keyword void is missing. in D, the keyword static is missing. C is correct.

#
23. Which of the following statements is correct?
a. Every line in a program must end with a semicolon.
b. Every statement in a program must end with a semicolon.
c. Every comment line must end with a semicolon.
d. Every method must end with a semicolon.
e. Every class must end with a semicolon.
Key:b Only statements need to be end with a semicolon.

#
24. Which of the following statements is correct to display Welcome to Java on the console?
a. System.out.println('Welcome to Java');
b. System.out.println("Welcome to Java");
c. System.println('Welcome to Java');
d. System.out.println('Welcome to Java");
e. System.out.println("Welcome to Java');
Key:b In A, a string must be enclosed in double quotation marks. In C, a string must be enclosed in double quotation marks and also the .out is missing. In D, a string must be enclosed in double quotation marks on both sides. In E, a string must be enclosed in double quotation marks. B is correct.

#
Section 1.8 Creating, Compiling, and Executing a Java Program
25. The JDK command to just compile a class (not run) in the file Test.java is
a. java Test
b. java Test.java
c. javac Test.java
d. javac Test
e. JAVAC Test.java
Key:c In A, java is the command to run a program. In B, java is the command to run a program. In D, java is the command to run a program. In E, The command is case sensitive. C is correct.

#
26. Which JDK command is correct to run a Java application in ByteCode.class?
a. java ByteCode
b. java ByteCode.class
c. javac ByteCode.java
d. javac ByteCode
e. JAVAC ByteCode
Key:a A is correct. In B, to compile, use only the class name, not including the extension. In C, javac is the command to compile a class, not to run a class. In D, javac is the command to compile a class, not to run a class. In E, the command is case sensitive and javac is the command to compile a class, not to run a class.

#
27. Java compiler translates Java source code into_____.
a. Java bytecode

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b. machine code
c. assembly code
d. another high-level language code
Key:a Java bytecode is the end result of compiling a Java source file. Java bytecode is machine-indepedent and can be run on any platform.

#
28. _____ is a software that interprets Java bytecode.
a. Java virtual machine
b. Java compiler
c. Java debugger
d. Java API
Key:a Java virtual machine is a software that runs Java bytecode. Java compiler compiles Java source code into Java bytecode.

#
29. Suppose you define a Java class as follows, the source code should be stored in a file named_____.

```
public class Test {

}
```

a. Test.class
b. Test.doc
c. Test.txt
d. Test.java
e. Any name with extension .java
Key:d You have to name the class as ClassName.java. Here the class name is Test.

#
30. The extension name of a Java bytecode file is
a. .java
b. .obj
c. .class
d. .exe
Key:c .java is the Java source code file name and .class is the Java bytecode file name.

#
31. The extension name of a Java source code file is
a. .java
b. .obj
c. .class
d. .exe
Key:a .java is the Java source code file name and .class is the Java bytecode file name.

#
32. Which of the following lines is not a Java comment?
a. /** comments */
b. // comments
c. -- comments
d. /* comments */
e. ** comments **
Key:ce The text that begins with // in a line is known as a line comment and the text that is enclosed between /* and */ is known as a paragraph comment.

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#
33. Which of the following are the reserved words?
a. public
b. static
c. void
d. class
Key:abcd These are all reserved words with specific meaning to the compiler.

#
34. Every statement in Java ends with_____.
a. a semicolon (;)
b. a comma (,)
c. a period (.)
d. an asterisk (*)
Key:a You have to tell the compiler where a statement ends using a semicolon.

#
35. A block is enclosed inside_____.
a. parentheses
b. braces
c. brackets
d. quotes
Key:b A block is enclosed inside a pair of openning and closing braces.

#
Section 1.9 Programming Style and Documentation
36. Programming style is important, because_____.
a. a program may not compile if it has a bad style
b. good programming style can make a program run faster
c. good programming style makes a program more readable
d. good programming style helps reduce programming errors
Key:cd Bad style is a readability issue. The code will still compile. Programming style is a readability issue and it does not effect the performance of the code. D and C are correct.

#
37. Analyze the following code.

I:
```
public class Test {
  public static void main(String[] args) {
    System.out.println("Welcome to Java!");
  }
}
```

II:
```
public class Test {  public static void main(String[] args) {
System.out.println("Welcome to Java!");  } }
```

a. Both I and II can compile and run and display Welcome to Java, but the code in II has a better style than I.
b. Only the code in I can compile and run and display Welcome to Java.
c. Only the code in II can compile and run and display Welcome to Java.
d. Both I and II can compile and run and display Welcome to Java, but the code in I has a better style than II.
Key:d Both I and II are the same except the format is different. Format is a readability issue only.

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#
38. Which of the following code has the best style?

I:
```
public class Test {
public static void main(String[] args) {
   System.out.println("Welcome to Java!");
  }
}
```

II:
```
public class Test {
   public static void main(String[] args) {
   System.out.println("Welcome to Java!");
  }
}
```

III:
```
public class Test {
  public static void main(String[] args) {
  System.out.println("Welcome to Java!");
  }
}
```

IV:
```
public class Test {
  public static void main(String[] args) {
    System.out.println("Welcome to Java!");
  }
}
```

a. I
b. II
c. III
d. IV
Key:d All the code will run fine, but not formatted correctly. Only the code in IV is formatted correctly.

#
Section 1.10 Programming Errors
39. If a program compiles fine, but it produces incorrect result, then the program suffers_____.
a. a compile error
b. a runtime error
c. a logic error
Key:c If a program has a compile error, it will not run. When a program has a runtime error, it terminates abnormally. C is correct.

#
40. If you forget to put a closing quotation mark on a string, what kind of error will be raised?
a. a compile error
b. a runtime error
c. a logic error
Key:a This is a syntax error, which will be detected by the compiler.

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Chapter 2 Elementary Programming

Section 2.2 Writing a Simple Program
1. _____ is the code with natural language mixed with Java code.
a. Java program
b. A Java statement
c. Pseudocode
d. A flowchart diagram
key:c See the second paragraph in this section.

#
2. What is the exact output of the following code?

```
double area = 3.5;
System.out.print("area");
System.out.print(area);
```

a. 3.53.5
b. 3.5 3.5
c. area3.5
d. area 3.5
Key:c The first print statement prints a string followed by the second print statement that prints a number.

#
Section 2.3 Reading Input from the Console
3. Suppose a Scanner object is created as follows, what method do you use to read a real number?

```
Scanner input = new Scanner(System.in);
```

a. input.nextDouble();
b. input.nextdouble();
c. input.double();
d. input.Double();
Key:a The correct method to read a real number is nextDouble().

#
4. The following code fragment reads in two numbers. What is the incorrect way to enter these two numbers?

```
Scanner input = new Scanner(System.in);
int i = input.nextInt();
double d = input.nextDouble();
```

a. Enter an integer, a space, a double value, and then the Enter key.
b. Enter an integer, two spaces, a double value, and then the Enter key.
c. Enter an integer, an Enter key, a double value, and then the Enter key.
d. Enter a numeric value with a decimal point, a space, an integer, and then the Enter key.
Key:d See Listing 2.3.

#
5. If you enter 1 2 3, when you run this program, what will be the output?

```
import java.util.Scanner;
```

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```
public class Test1 {
  public static void main(String[] args) {
    Scanner input = new Scanner(System.in);
    System.out.print("Enter three numbers: ");
    double number1 = input.nextDouble();
    double number2 = input.nextDouble();
    double number3 = input.nextDouble();

    // Compute average
    double average = (number1 + number2 + number3) / 3;

    // Display result
    System.out.println(average);
  }
}
```

a. 1.0
b. 2.0
c. 3.0
d. 4.0
Key:b (1.0 + 2.0 + 3.0) / 3 is 2.0

#
Section 2.4 Identifiers
6. Every letter in a Java keyword is in lowercase?
a. true
b. false
Key:a It is true that the keywords in Java are in lowercase. For example, public, static, int, double, and void are the keywords.

#
7. Which of the following is a valid identifier?
a. $343
b. class
c. 9X
d. 8+9
e. radius
Key:ae class is a keyword, which cannot be used as an identifier. Identifiers cannot start with a number.

#
Section 2.5 Variables
8. Which of the following are correct names for variables according to Java naming conventions?
a. radius
b. Radius
c. RADIUS
d. findArea
e. FindArea
Key:ad A single-word variable is in lowercase. In a multiple-word variable, the words are concatenated with the first word in lowercase and the first letter of each subsequent word in uppercase.

#
9. Which of the following are correct ways to declare variables?
a. int length; int width;
b. int length, width;

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c. int length; width;
d. int length, int width;
Key:ab Note that a semicolon ends a statement. In B, length and width are both declared as int.

#
Section 2.6 Assignment Statements and Assignment Expressions
10. _____ is the Java assignment operator.
a. ==
b. :=
c. =
d. =:
Key:c See the first paragraph.

#
11. To assign a value 1 to variable x, you write
a. 1 = x;
b. x = 1;
c. x := 1;
d. 1 := x;
e. x == 1;
Key:b See the first paragraph.

#
12. Which of the following assignment statements is incorrect?
a. i = j = k = 1;
b. i = 1; j = 1; k = 1;
c. i = 1 = j = 1 = k = 1;
d. i == j == k == 1;
Key:cd Read toward the end of the section.

#
Section 2.7 Named Constants
13. To declare a constant MAX_LENGTH inside a method with value 99.98, you write
a. final MAX_LENGTH = 99.98;
b. final float MAX_LENGTH = 99.98;
c. double MAX_LENGTH = 99.98;
d. final double MAX_LENGTH = 99.98;
Key:d See the first paragraph.

#
14. Which of the following is a constant, according to Java naming conventions?
a. MAX_VALUE
b. Test
c. read
d. ReadInt
e. COUNT
Key:ae All letters in a constant are in uppercase. In a multiple-word constant, the words are connected using underscores.

#
15. To improve readability and maintainability, you should declare a_____for PI instead of using literal values such as 3.14159.
a. variable
b. method

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c. constant
d. class
Key:c A constant gives a literal a descriptive name and makes the code more readable.

#
Section 2.8 Naming Conventions
16. According to Java naming convention, which of the following names can be variables?
a. FindArea
b. findArea
c. totalLength
d. TOTAL_LENGTH
e. class
Key:bc The first word in a variable is in lowercase. So B and C are correct.

#
Section 2.9 Numeric Data Types and Operations
17. Which of these data types requires the most amount of memory?
a. long
b. int
c. short
d. byte
Key:a long takes 8 bytes. int 4 bytes. short 2 bytes. byte 1 byte.

#
Section 2.9.2 Numeric Operators
19. What is the result of 45 / 4?
a. 10
b. 11
c. 11.25
d. 12
Key:b The result of the division is the quotient and the fractional part is truncated. So 45 / 4 is 11. 3 / 2 is 1, and so on.

#
20. Which of the following expression results in a value 1?
a. 2 % 1
b. 15 % 4
c. 25 % 5
d. 37 % 6
Key:d 2 % 1 is 0, 15 % 4 is 3, 25 % 5 is 0, and 37 % 6 is 1

#
21. 25 % 1 is _____
a. 1
b. 2
c. 3
d. 4
e. 0
Key:e The reminder of any integer by 1 is 0.

#
22. -25 % 5 is _____
a. 1
b. 2
c. 3

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d. 4
e. 0
Key:e

#
23. 24 % 5 is _____
a. 1
b. 2
c. 3
d. 4
e. 0
Key:d

#
24. -24 % 5 is _____
a. -1
b. -2
c. -3
d. -4
e. 0
Key:d

#
25. -24 % -5 is _____
a. 3
b. -3
c. 4
d. -4
e. 0
Key:d

#
Section 2.9.3 Exponent Operations
26. How do you write 2.5 ^ 3.1 in Java?
a. 2.5 * 3.1
b. Math.pow(2.5, 3.1)
c. Math.pow(3.1, 2.5)
d. 2.5 ** 3.1
e. 3.1 ** 2.5
Key:b See the first paragraph of the section.

#
27. Math.pow(2, 3) returns_____.
a. 9
b. 8
c. 9.0
d. 8.0
Key:d It returns a double value 8.0.

#
28. Math.pow(4, 1 / 2) returns_____.
a. 2
b. 2.0
c. 0

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d. 1.0
e. 1
Key:d Note that 1 / 2 is 0.

#
29. Math.pow(4, 1.0 / 2) returns_____.
a. 2
b. 2.0
c. 0
d. 1.0
e. 1
Key:b Note that the pow method returns a double value, not an integer.

#
30. The_____method returns a raised to the power of b.
a. Math.power(a, b)
b. Math.exponent(a, b)
c. Math.pow(a, b)
d. Math.pow(b, a)
Key:c See line 1 in Section 2.9.3.

#
Section 2.10 Numeric Literals
32. Analyze the following code.

```
public class Test {
  public static void main(String[] args) {
    int month = 09;
    System.out.println("month is " + month);
  }
}
```

a. The program displays month is 09.
b. The program displays month is 9.
c. The program displays month is 9.0.
d. The program has a syntax error, because 09 is an incorrect literal value.
Key:d Any numeric literal with the prefix 0 is an octal value. But 9 is not an octal digit. An octal digit is 0, 1, 2, 3, 4, 5, 6, or 7.

#
33. Which of the following is incorrect?
a. 1_2
b. 0.4_56
c. 1_200_229
d. _4544
Key:d You can use the digit separator _ for integers or floating point numbers. The separator must be placed between the digits.

#
34. Which of the following are the same as 1545.534?
a. 1.545534e+3
b. 0.1545534e+4
c. 1545534.0e-3
d. 154553.4e-2
Key:abcd See Section 2.10.3.

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#
31. To declare an int variable number with initial value 2, you write
a. int number = 2L;
b. int number = 2l;
c. int number = 2;
d. int number = 2.0;
Key:c See Section 2.10.1.

#
35. Which of the following is incorrect?
a. int x = 9;
b. long x = 9;
c. float x = 1.0;
d. double x = 1.0;
Key:c Section 2.10.2.

#
Section 2.11 Prototyping Using JShell
31. The command to exit JShell is_____.
a. \quit
b. \exit
c. /quit
d. /exit
Key:d Read toward the end of this section.

#
31. The command to view all variables in JShell is_____.
a. \vars
b. \var
c. /vars
d. /var
Key:c See Figure 2.5.

#
Section 2.12 Evaluating Expressions and Operator Precedence
36. The expression 4 + 20 / (3 - 1) * 2 is evaluated to
a. 4
b. 20
c. 24
d. 9
e. 25
Key:c See the second paragraph in this section.

#
Section 2.13 Case Study: Displaying the Current Time
37. The System.currentTimeMillis() returns_____.
a. the current time.
b. the current time in milliseconds.
c. the current time in milliseconds since midnight.
d. the current time in milliseconds since midnight, January 1, 1970.
e. the current time in milliseconds since midnight, January 1, 1970 GMT (the Unix time).
Key:e See Listing 2.7.

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#
38. To obtain the current second, use_____.
a. System.currentTimeMillis() % 3600
b. System.currentTimeMillis() % 60
c. System.currentTimeMillis() / 1000 % 60
d. System.currentTimeMillis() / 1000 / 60 % 60
e. System.currentTimeMillis() / 1000 / 60 / 60 % 24
Key:c See Listing 2.7.

#
39. To obtain the current minute, use_____.
a. System.currentTimeMillis() % 3600
b. System.currentTimeMillis() % 60
c. System.currentTimeMillis() / 1000 % 60
d. System.currentTimeMillis() / 1000 / 60 % 60
e. System.currentTimeMillis() / 1000 / 60 / 60 % 24
Key:d See Listing 2.7.

#
40. To obtain the current hour in UTC, use_____.
a. System.currentTimeMillis() % 3600
b. System.currentTimeMillis() % 60
c. System.currentTimeMillis() / 1000 % 60
d. System.currentTimeMillis() / 1000 / 60 % 60
e. System.currentTimeMillis() / 1000 / 60 / 60 % 24
Key:e See Listing 2.7.

#
Section 2.14 Augmented Assignment Operators
43. Suppose x is 1. What is x after x += 2?
a. 0
b. 1
c. 2
d. 3
e. 4
Key:d See Table 2.4

#
44. Suppose x is 1. What is x after x -= 1?
a. 0
b. 1
c. 2
d. -1
e. -2
Key:a See Table 2.4

#
45. What is x after the following statements?

```
int x = 2;
int y = 1;
x *= y + 1;
```

a. x is 1.

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b. x is 2.
c. x is 3.
d. x is 4.
Key:d (y + 1) is executed first and its result is multiplied with x and assigned to x.

#
46. What is x after the following statements?

```
int x = 1;
x *= x + 1;
```

a. x is 1.
b. x is 2.
c. x is 3.
d. x is 4.
Key:b See Table 2.4.

#
47. Which of the following statements are the same?

(A) x -= x + 4
(B) x = x + 4 - x
(C) x = x - (x + 4)

a. (A) and (B) are the same
b. (A) and (C) are the same
c. (B) and (C) are the same
d. (A), (B), and (C) are the same
Key:b See Table 2.4.

#
41. To add a value 1 to variable x, you write
a. 1 + x = x;
b. x += 1;
c. x := 1;
d. x = x + 1;
e. x = 1 + x;
Key:bde See Table 2.4.

#
42. To add number to sum, you write (Note: Java is case-sensitive)
a. number += sum;
b. number = sum + number;
c. sum = Number + sum;
d. sum += number;
e. sum = sum + number;
Key:de See Table 2.4.

#
Section 2.15 Increment and Decrement Operators
49. What is i printed?

```
public class Test {
  public static void main(String[] args) {
```

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```
    int j = 0;
    int i = ++j + j * 5;

    System.out.println("What is i? " + i);
  }
}
```

a. 0
b. 1
c. 5
d. 6

Key:d Operands are evaluated from left to right in Java. The left-hand operand of a binary operator is evaluated before any part of the right-hand operand is evaluated. This rule takes precedence over any other rules that govern expressions. Therefore, ++j is evaluated first, and j is now 1. Then j * 5 is evaluated, returns 5. So, i is 6.

#

50. What is i printed in the following code?

```
public class Test {
  public static void main(String[] args) {
    int j = 0;
    int i = j++ + j * 5;

    System.out.println("What is i? " + i);
  }
}
```

a. 0
b. 1
c. 5
d. 6

Key:c Operands are evaluated from left to right in Java. The left-hand operand of a binary operator is evaluated before any part of the right-hand operand is evaluated. This rule takes precedence over any other rules that govern expressions. Therefore, j++ is evaluated first. j is now 1. Since j++ is postincrement, the old value of j is returned for j++. So j++ + j * 5 equals 0 + 1 * 5. So, the result is 5.

#

51. What is y displayed in the following code?

```
public class Test {
  public static void main(String[] args) {
    int x = 1;
    int y = x++ + x;
    System.out.println("y is " + y);
  }
}
```

a. y is 1.
b. y is 2.
c. y is 3.
d. y is 4.

Key:c When evaluating x++ + x, x++ is evaluated first, which does two things: 1. returns 1 since it is post-increment. x becomes 2. Therefore y is 1 + 2.

#

52. What is y displayed?

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```
public class Test {
  public static void main(String[] args) {
    int x = 1;
    int y = x + x++;
    System.out.println("y is " + y);
  }
}
```

a. y is 1.
b. y is 2.
c. y is 3.
d. y is 4.
Key:b When evaluating x + x++, x is evaluated first, which is 1. X++ returns 1 since it is post-increment and 2. Therefore y is 1 + 1.

#
48. Are the following four statements equivalent?

```
number += 1;
number = number + 1;
number++;
++number;
```

a. Yes
b. No
Key:a See Table 2.5.

#
Section 2.16 Numeric Type Conversions
53. To assign a double variable d to a float variable x, you write
a. x = (long)d
b. x = (int)d;
c. x = d;
d. x = (float)d;
Key:d See the second paragraph in this section.

#
54. Which of the following expressions will yield 0.5?
a. 1 / 2
b. 1.0 / 2
c. (double) (1 / 2)
d. (double) 1 / 2
e. 1 / 2.0
Key:bde 1 / 2 is an integer division, which results in 0.

#
55. What is the output of the following code:

```
double x = 5.5;
int y = (int)x;
System.out.println("x is " + x + " and y is " + y);
```

a. x is 5 and y is 6
b. x is 6.0 and y is 6.0
c. x is 6 and y is 6
d. x is 5.5 and y is 5
e. x is 5.5 and y is 5.0

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Key:d The value is x is not changed after the casting.

#
56. Which of the following assignment statements is illegal?
a. float f = -34;
b. int t = 23;
c. short s = 10;
d. int t = 4.5;
Key:d See the second paragraph in this section.

#
57. What is the value of (double)5/2?
a. 2
b. 2.5
c. 3
d. 2.0
e. 3.0
Key:b See the second code box in this section.

#
58. What is the value of (double)(5/2)?
a. 2
b. 2.5
c. 3
d. 2.0
e. 3.0
Key:d See the second paragraph in this section.

#
59. Which of the following expression results in 45.37?
a. (int)(45.378 * 100) / 100
b. (int)(45.378 * 100) / 100.0
c. (int)(45.378 * 100 / 100)
d. (int)(45.378) * 100 / 100.0
Key:b See Listing 2.8.

#
60. The expression (int)(76.0252175 * 100) / 100 evaluates to_____.
a. 76.02
b. 76
c. 76.0252175
d. 76.03
Key:b In order to obtain 76.02, you have divide 100.0.

#
61. If you attempt to add an int, a byte, a long, and a double, the result will be a(n)_____value.
a. byte
b. int
c. long
d. double
Key:d See the second paragraph in this section.

#
Section 2.17 Software Life Cycle

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62. _____ is a formal process that seeks to understand the problem and document in detail what the software system needs to do.
a. Requirements specification
b. Analysis
c. Design
d. Implementation
e. Testing
Key:a See the second paragraph in this section.

#
63. _____ seeks to analyze the data flow and to identify the system's input and output. When you do analysis, it helps to identify what the output is first, and then figure out what input data you need in order to produce the output.
a. Requirements specification
b. Analysis
c. Design
d. Implementation
e. Testing
Key:b See the third paragraph in this section.

#
Section 2.18 Case Study: Counting Monetary
62. Suppose int x = 3264, what is the output of the following code?

```
int y = x % 10;
x = x / 10;
System.out.println("x is " + x + " and y is " + y);
```

a. x is 3264 and y is 326.4
b. x is 326 and y is 326
c. x is 326 and y is 4
d. x is 3264 and y is 4
e. x is 4 and y is 326
Key:c 3264 / 10 is 326 and 3264 % 10 is 4.

#
Section 2.19 Common Errors and Pitfalls
64. Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    int n = 10000 * 10000 * 10000;
    System.out.println("n is " + n);
  }
}
```

a. The program displays n is 1000000000000.
b. The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an overflow and the program is aborted.
c. The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an overflow and the program continues to execute because Java does not report errors on overflow.
d. The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an underflow and the program is aborted.
e. The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an underflow and the program continues to execute because Java does not report errors on underflow.

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Key:c See Common Error 2: Integer Overflow.

#
18. When assigning a literal to a variable of the byte type, if the literal is too large to be stored as a byte value, it _____.
a. causes overflow
b. causes underflow
c. causes no error
d. cannot happen in Java
e. receives a compile error
Key:e For example, byte b = 23232 will cause a compile error.

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