6.1 What will be the result of attempting to compile and run the following class?

```
public class IfTest {
  public static void main(String[] args) {
    if (true)
    if (false)
    System.out.println("a");
    else
    System.out.println("b");
  }
}
```

Select the one correct answer.
(a) The code will fail to compile because the syntax of the if statement is incorrect.
(b) The code will fail to compile because the compiler will not be able to determine which if statement the else clause belongs to.
(c) The code will compile correctly and display the letter a, when run.
(d) The code will compile correctly and display the letter b, when run.
(e) The code will compile correctly, but will not display any output.

6.2 Which statements are true?

Select the three correct answers.
(a) The conditional expression in an if statement can have method calls.
(b) If a and b are of type boolean, the expression (a = b) can be the conditional expression of an if statement.
(c) An if statement can have either an if clause or an else clause.
(d) The statement if (false) ; else ; is illegal.
(e) Only expressions which evaluate to a boolean value can be used as the condition in an if statement.

6.3 What, if anything, is wrong with the following code?

```
void test(int x) {
  switch (x) {
    case 1:
    case 2:
    case 0:
    default:
    case 4:
  }
}
```

Select the one correct answer.
(a) The variable x does not have the right type for a switch expression.
(b) The case label 0 must precede case label 1.
(c) Each case section must end with a break statement.
(d) The default label must be the last label in the switch statement.
(e) The body of the switch statement must contain at least one statement.
(f) There is nothing wrong with the code.

6.4 Which of these combinations of switch expression types and case label value types are legal within a switch statement?

Select the two correct answers.
(a) switch expression of type int and case label value of type char.
(b) switch expression of type float and case label value of type int.
(c) switch expression of type byte and case label value of type float.
(d) switch expression of type char and case label value of type long.
(e) switch expression of type boolean and case label value of type boolean.
(f) switch expression of type Byte and case label value of type byte.
(g) switch expression of type byte and case label value of type Byte.

6.5 What will be the result of attempting to compile and run the following program?

```
public class Switching {
  public static void main(String[] args) {
    final int iLoc = 3;
    switch (6) {
      case 1:
      case iLoc:
      case 2 * iLoc:
        System.out.println("I am not OK.");
      default:
        System.out.println("You are OK.");
      case 4:
        System.out.println("It's OK.");
    }
  }
}
```

Select the one correct answer.
(a) The code will fail to compile because of the case label value 2 * iLoc.
(b) The code will fail to compile because the default label is not specified last in the switch statement.
(c) The code will compile correctly and will only print the following, when run:
I am not OK.
You are OK.
It's OK.
(d) The code will compile correctly and will only print the following, when run:
You are OK.
It's OK.
(e) The code will compile correctly and will only print the following, when run:
It's OK.

6.6 What will be the result of attempting to compile and run the following program?

```
public class MoreSwitching {
  public static void main(String[] args) {
    final int iLoc = 3;
    Integer iRef = 5;
    switch (iRef) {
      default:
          System.out.println("You are OK.");
      case 1:
      case iLoc:
      case 2 * iLoc:
        System.out.println("I am not OK.");
        break;
      case 4:
          System.out.println("It's OK.");
    }
  }
}
```

Select the one correct answer.
(a) The code will fail to compile because the type of the switch expression is not valid.
(b) The code will compile correctly and will only print the following, when run:
You are OK.
I am not OK.
(c) The code will compile correctly and will only print the following, when run:
You are OK.
I am not OK.
It's OK.
(d) The code will compile correctly and will only print the following, when run:
It's OK.

6.7 What will be the result of attempting to compile and run the following program?

```java
public class KeepOnSwitching {
  public static void main(String[] args) {
    final int iLoc = 3;
    final Integer iFour = 4;
    Integer iRef = 4;
    switch (iRef) {
      case 1:
      case iLoc:
      case 2 * iLoc:
        System.out.println("I am not OK.");
      default:
System.out.println("You are OK.");
      case iFour:
System.out.println("It's OK.");
    }
  }
}
```

Select the one correct answer.
(a) The code will fail to compile because of the value of one of the case labels.
(b) The code will fail to compile because of the type of the switch expression.
(c) The code will compile correctly and will only print the following, when run:
You are OK.
It's OK.
(d) The code will compile correctly and will only print the following, when run:
It's OK.

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

```java
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';
    }
    return grade;
  }
  public static void main (String[] args) {
    System.out.println(GOOD.getGrade());
  }
}
```

Select the one correct answer.
(a) The program will not compile because of the switch expression.
(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 only prints the following, when run:
C
(e) The program compiles and only prints the following, when run:
GOOD
(f) None of the above.

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

```java
class MyClass {
  public static void main(String[] args) {
    boolean b = false;
    int i = 1;
    do {
      i++;
      b = ! b;
    } while (b);
    System.out.println(i);
  }
}
```

Select the one correct answer.
(a) The code will fail to compile because b is an invalid conditional expression for the do-while statement.
(b) The code will fail to compile because the assignment b = ! b is not allowed.
(c) The code will compile without error and will print 1, when run.
(d) The code will compile without error and will print 2, when run.
(e) The code will compile without error and will print 3, when run.

6.10 What will be the output when running the following program?

```java
public class MyClass {
  public static void main(String[] args) {
    int i=0;
    int j;
    for (j=0; j<10; ++j) { i++; }
    System.out.println(i + " " + j);
  }
}
```

Select the two correct answers.
(a) The first number printed will be 9.
(b) The first number printed will be 10.
(c) The first number printed will be 11.
(d) The second number printed will be 9.
(e) The second number printed will be 10.
(f) The second number printed will be 11.

6.11 Which one of these for statements is valid?
Select the one correct answer.
(a) `int j=10; for (int i=0, j+=90; i<j; i++) { j--; }`
(b) `for (int i=10; i=0; i--) {}`
(c) `for (int i=0, j=100; i<j; i++, --j) {;}`
(d) `int i, j; for (j=100; i<j; j--) { i += 2; }`
(e) `int i=100; for ((i>0); i--) {}`

6.12 What will be the result of attempting to compile and run the following program?

```java
class MyClass {
  public static void main(String[] args) {
    int i = 0;
    for (   ; i<10; i++) ;        // (1)
    for (i=0;   ; i++) break;     // (2)
    for (i=0; i<10;  ) i++;       // (3)
    for (  ; ;    ) ;             // (4)
  }
}
```

Select the one correct answer.

(a) The code will fail to compile because the expression in the first section of the for statement (1) is empty.

(b) The code will fail to compile because the expression in the middle section of the for statement (2) is empty.

(c) The code will fail to compile because the expression in the last section of the for statement (3) is empty.

(d) The code will fail to compile because the for statement (4) is invalid.

(e) The code will compile without error, and the program will run and terminate without any output.

(f) The code will compile without error, but will never terminate when run.

6.13 Which statements are valid when occurring on their own?

Select the three correct answers.

(a) `while () break;`

(b) `do { break; } while (true);`

(c) `if (true) { break; }`

(d) `switch (1) { default: break; }`

(e) `for (;true;) break;`

6.14 Given the following code fragment, which of the following lines will be a part of the output?

```
outer:
for (int i = 0; i < 3; i++) {
  for (int j = 0; j < 2; j++) {
    if (i == j) {
      continue outer;
    }
    System.out.println("i=" + i + ", j=" + j);
  }
}
```

Select the two correct answers.

(a) i=1, j=0

(b) i=0, j=1

(c) i=1, j=2

(d) i=2, j=1

(e) i=2, j=2

(f) i=3, j=3

(g) i=3, j=2

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

```
class MyClass {
  public static void main(String[] args) {
    for (int i = 0; i<10; i++) {
      switch(i) {
        case 0:
  System.out.println(i);
      }
      if (i) {
        System.out.println(i);
      }
    }
  }
}
```

Select the one correct answer.

(a) The code will fail to compile because of an illegal switch expression in the switch statement.

(b) The code will fail to compile because of an illegal conditional expression in the if statement.

(c) The code will compile without error and will print the numbers 0 through 10, when run.

(d) The code will compile without error and will print the number 0, when run.

(e) The code will compile without error and will print the number 0 twice, when run.

(f) The code will compile without error and will print the numbers 1 through 10, when run.

6.16 Which of the following implementations of a max() will correctly return the largest value?

```
int max(int x, int y) {                                    // (1)
  return (if (x > y) { x; } else { y; });
}
int max(int x, int y) {                                    // (2)
  return (if (x > y) { return x; } else { return y; });
}
int max(int x, int y) {                                    // (3)
  switch (x < y) {
    case true:    return y;
    default:      return x;
  };
}
int max(int x, int y) {                                    // (4)
  if (x>y) return x;
  return y;
}
```

Select the one correct answer.

(a) Implementation labeled (1).

(b) Implementation labeled (2).

(c) Implementation labeled (3).

(d) Implementation labeled (4).

6.17 Given the following code, which statement is true?

```
class MyClass {
  public static void main(String[] args) {
    int k=0;
    int l=0;
    for (int i=0; i <= 3; i++) {
      k++;
      if (i == 2) break;
      l++;
    }
    System.out.println(k + ", " + l);
  }
}
```

Select the one correct answer.

(a) The program will fail to compile.

(b) The program will print 3, 3, when run.

(c) The program will print 4, 3, when run, if break is replaced by continue.

(d) The program will fail to compile if break is replaced by return.

(e) The program will fail to compile if break is by an empty statement.

6.18 Which statements are true?

Select the two correct answers.

(a) {{}} is a valid statement block.

(b) { continue; } is a valid statement block.

(c) block: { break block; } is a valid statement block.

(d) block: { continue block; } is a valid statement block.

(e) The break statement can only be used in a loop (while, do-while or for) or a switch statement.

6.19 Which declaration will result in the program compiling and printing 90, when run?

```
public class RQ400_10 {
  public static void main(String[] args) {
    // (1) INSERT DECLARATION HERE
    int sum = 0;
    for (int i : nums)
      sum += i;
    System.out.println(sum);
  }
}
```

Select the two correct answers.

(a) `Object[] nums = {20, 30, 40};`
(b) `Number[] nums = {20, 30, 40};`
(c) `Integer[] nums = {20, 30, 40};`
(d) `int[] nums = {20, 30, 40};`
(e) `None of the above.`

6.20 Which method declarations, when inserted at (1), will result in the program compiling and printing 90 when run?

```java
public class RQ400_30 {
  public static void main(String[] args) {
    doIt();
  }
  // (1) INSERT METHOD DECLARATION HERE.
}
```

Select the two correct answers.

```java
(a) public static void doIt() {
  int[] nums = {20, 30, 40};
  for (int sum = 0, i : nums)
    sum += i;
  System.out.println(sum);
}
(b) public static void doIt() {
  for (int sum = 0, i : {20, 30, 40})
    sum += i;
  System.out.println(sum);
}
(c) public static void doIt() {
  int sum = 0;
  for (int i : {20, 30, 40})
    sum += i;
  System.out.println(sum);
}
(d) public static void doIt() {
  int sum = 0;
  for (int i : new int[] {20, 30, 40})
    sum += i;
  System.out.println(sum);
}
(e) public static void doIt() {
  int[] nums = {20, 30, 40};
  int sum = 0;
  for (int i : nums)
    sum += i;
  System.out.println(sum);
}
```

6.21 Given the declaration:

```java
int[][] nums = {{20}, {30}, {40}};
```

Which code will compile and print 90, when run?

Select the one correct answer.

```java
(a)
  int sum = 0;
  for (int[] row : nums[])
    for (int val : nums[row])
      sum += val;
  System.out.println(sum);
(b)
  int sum = 0;
  for (int[] row : nums[][])
    for (int val : nums[row])
      sum += val;
  System.out.println(sum);
(c)
  int sum = 0;
  for (int[] row : nums)
    for (int val : nums[row])
      sum += val;
  System.out.println(sum);
(d)
  int sum = 0;
  for (int[] row : nums)
    for (int val : row)
      sum += val;
  System.out.println(sum);
(e)
  int sum = 0;
  for (Integer[] row : nums)
    for (int val : row)
      sum += val;
  System.out.println(sum);
```

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

```java
public class RQ200_150 {
  public static void main(String[] args) {
    for (Character cRef = 'A'; cRef < 'F'; cRef++)
      switch(cRef) {
        default: System.out.print((char)('a' + cRef - 'A')); break;
        case 'B': System.out.print(cRef); break;
        case 68: System.out.print(cRef);  // 68 == 'D'
      }
  }
}
```

Select the one correct answer.

(a) The code will fail to compile because of errors in the for loop header.
(b) The code will fail to compile because of errors in the switch statement.
(c) The code will compile, but throws a NullPointerException.
(d) The code will compile and print: aBcDe

6.23 Which digits, and in what order, will be printed when the following program is run?

```java
public class MyClass {
  public static void main(String[] args) {
    int k=0;
    try {
      int i = 5/k;
    } catch (ArithmeticException e) {
System.out.println("1");
    } catch (RuntimeException e) {
System.out.println("2");
      return;
    } catch (Exception e) {
System.out.println("3");
    } finally {
System.out.println("4");
    }
    System.out.println("5");
  }
}
```

Select the one correct answer.
(a) The program will only print 5.
(b) The program will only print 1 and 4, in that order.
(c) The program will only print 1, 2, and 4, in that order.
(d) The program will only print 1, 4, and 5, in that order.
(e) The program will only print 1, 2, 4, and 5, in that order.
(f) The program will only print 3 and 5, in that order.

6.24 Given the following program, which statements are true?

```java
public class Exceptions {
  public static void main(String[] args) {
    try {
      if (args.length == 0) return;
      System.out.println(args[0]);
    } finally {
      System.out.println("The end");
    }
  }
}
```

Select the two correct answers.
(a) If run with no arguments, the program will produce no output.
(b) If run with no arguments, the program will print "The end".
(c) The program will throw an ArrayIndexOutOfBoundsException.
(d) If run with one argument, the program will simply print the given argument.
(e) If run with one argument, the program will print the given argument followed by "The end".

6.25 What will be the result of attempting to compile and run the following program?

```java
public class MyClass {
  public static void main(String[] args) {
    RuntimeException re = null;
    throw re;
  }
}
```

Select the one correct answer.
(a) The code will fail to compile because the main() method does not declare that it throws RuntimeException in its declaration.
(b) The program will fail to compile because it cannot throw re.
(c) The program will compile without error and will throw java.lang.RuntimeException when run.
(d) The program will compile without error and will throw java.lang.NullPointerException when run.
(e) The program will compile without error and will run and terminate without any output.

6.26 Which statements are true?

Select the two correct answers.
(a) If an exception is not caught in a method, the method will terminate and normal execution will resume.
(b) An overriding method must declare that it throws the same exception classes as the method it overrides.
(c) The main() method of a program can declare that it throws checked exceptions.
(d) A method declaring that it throws a certain exception class may throw instances of any subclass of that exception class.
(e) finally blocks are executed if, and only if, an exception gets thrown while inside the corresponding try block.

6.27 Which digits, and in what order, will be printed when the following program is compiled and run?

```java
public class MyClass {
  public static void main(String[] args) {
    try {
      f();
    } catch (InterruptedException e) {
System.out.println("1");
      throw new RuntimeException();
    } catch (RuntimeException e) {
System.out.println("2");
      return;
    } catch (Exception e) {
```

System.out.println("3");
    } finally {
System.out.println("4");
    }
    System.out.println("5");
  }
  // InterruptedException is a direct subclass of Exception.
  static void f() throws InterruptedException {
    throw new InterruptedException("Time for lunch.");
  }
}

Select the one correct answer.
(a) The program will print 5.
(b) The program will print 1 and 4, in that order.
(c) The program will print 1, 2, and 4, in that order.
(d) The program will print 1, 4, and 5, in that order.
(e) The program will print 1, 2, 4, and 5, in that order.
(f) The program will print 3 and 5, in that order.

6.28 Which digits, and in what order, will be printed when the following program is run?

```java
public class MyClass {
  public static void main(String[] args) throws InterruptedException {
    try {
      f();
      System.out.println("1");
    } finally {
      System.out.println("2");
    }
    System.out.println("3");
  }
  // InterruptedException is a direct subclass of Exception.
  static void f() throws InterruptedException {
    throw new InterruptedException("Time to go home.");
  }
}
```

Select the one correct answer.
(a) The program will print 2 and throw InterruptedException.
(b) The program will print 1 and 2, in that order.
(c) The program will print 1, 2, and 3, in that order.
(d) The program will print 2 and 3, in that order.
(e) The program will print 3 and 2, in that order.
(f) The program will print 1 and 3, in that order.

6.29 What is wrong with the following code?

```java
public class MyClass {
  public static void main(String[] args) throws A {
    try {
      f();
    } finally {
      System.out.println("Done.");
    } catch (A e) {
      throw e;
    }
  }
  public static void f() throws B {
    throw new B();
  }
}
class A extends Throwable {}
class B extends A {}
```

Select the one correct answer.
(a) The main() method must declare that it throws B.
(b) The finally block must follow the catch block in the main() method.
(c) The catch block in the main() method must declare that it catches B rather than A.
(d) A single try block cannot be followed by both a finally and a catch block.
(e) The declaration of class A is illegal.

6.30 What is the minimal list of exception classes that the overriding method f() in the following code must declare in its throws clause before the code will compile correctly?

```
class A {
  // InterruptedException is a direct subclass of Exception.
  void f() throws ArithmeticException, InterruptedException {
    div(5, 5);
  }
  int div(int i, int j) throws ArithmeticException {
    return i/j;
  }
}
public class MyClass extends A {
  void f() /* throws [...list of exceptions...] */ {
    try {
      div(5, 0);
    } catch (ArithmeticException e) {
      return;
    }
    throw new RuntimeException("ArithmeticException was expected.");
  }
}
```

Select the one correct answer.
(a) Does not need to specify any exceptions.
(b) Needs to specify that it throws ArithmeticException.
(c) Needs to specify that it throws InterruptedException.
(d) Needs to specify that it throws RuntimeException.
(e) Needs to specify that it throws both ArithmeticException and InterruptedException.

6.31 What, if anything, would cause the following code not to compile?

```
class A {
  void f() throws ArithmeticException {
    //...
  }
}
public class MyClass extends A {
  public static void main(String[] args) {
    A obj = new MyClass();
    try {
      obj.f();
    } catch (ArithmeticException e) {
      return;
    } catch (Exception e) {
      System.out.println(e);
      throw new RuntimeException("Something wrong here");
    }
  }
  // InterruptedException is a direct subclass of Exception.
  void f() throws InterruptedException {
    //...
  }
}
```

Select the one correct answer.
(a) The main() method must declare that it throws RuntimeException.
(b) The overriding f() method in MyClass must declare that it throws ArithmeticException, since the f() method in class A declares that it does.
(c) The overriding f() method in MyClass is not allowed to throw InterruptedException, since the f() method in class A does not throw this exception.
(d) The compiler will complain that the catch(ArithmeticException) block shadows the catch(Exception) block.
(e) You cannot throw exceptions from a catch block.
(f) Nothing is wrong with the code, it will compile without errors.

6.32 Assuming assertions are enabled, which of these assertion statements will throw an error?
Select the two correct answers.
(a) assert true : true;
(b) assert true : false;
(c) assert false : true;
(d) assert false : false;

6.33 Which of the following are valid runtime options?
Select the two correct answers.
(a) -ae
(b) -enableassertions
(c) -source 1.6
(d) -disablesystemassertions
(e) –dea

6.34 What is the class name of the exception thrown by an assertion statement?
Select the one correct answer.
(a) Depends on the assertion statement.
(b) FailedAssertion
(c) AssertionException
(d) RuntimeException
(e) AssertionError
(f) Error

6.35 What can cause an assertion statement to be ignored?
Select the one correct answer.
(a) Nothing.
(b) Using appropriate compiler options.
(c) Using appropriate runtime options.
(d) Using both appropriate compiler and runtime options.

6.36 Given the following method, which statements will throw an exception, assuming assertions are enabled?

```
static int inv(int value) {
  assert value > -50 : value < 100;
  return 100/value;
}
```

Select the two correct answers.
(a) inv(-50);   (b) inv(0);   (c) inv(50);
(d) inv(100);   (e) inv(150);

6.37 Which runtime options would cause assertions to be enabled for the class org.example.ttp.Bottle?
Select the two correct answers.
(a) -ea
(b) -ea:Bottle
(c) -ea:org.example
(d) -ea:org...
(e) -enableexceptions:org.example.ttp.Bottle
(f) -ea:org.example.ttp