# Chapter 3 Answers – Exercise 1

## 3.10

The if single-selection statement executes an action once if a condition is true. The while repetition statement executes an action repeatedly as long as a condition is true. Similarity: Both test a condition and control program flow. Difference: if runs once, while repeats.

## 3.11

When one integer is divided by another in Java, the result is an integer—the fractional part is discarded. To keep the fractional part, use floating-point division by converting one operand to a double or float, e.g., (double) a / b;

## 3.12

Control statements can be combined in two ways: (1) Sequentially—one after another. (2) Nested—placing one control statement inside another.

## 3.13

For the first 100 positive integers, use a counter-controlled loop (for loop). For an arbitrary number of integers, use a sentinel-controlled loop (while loop) that stops when a special value (like 0) is entered.

## 3.14

Preincrement (++x) increases the variable first, then uses the new value. Postincrement (x++) uses the current value first, then increases it.

## 3.15a

Corrected Code:  
if (age >= 65)  
 System.out.println("Age is greater than or equal to 65");  
else  
 System.out.println("Age is less than 65");

## 3.15b

Corrected Code:  
int x = 1, total = 0;  
while (x <= 10) {  
 total += x;  
 ++x;  
}

## 3.15c

Corrected Code:  
while (x <= 100) {  
 total += x;  
 ++x;  
}

## 3.15d

Corrected Code:  
while (y > 0) {  
 System.out.println(y);  
 --y;  
}