# Chapter 4

**Exercises:**

**1.**

1. T
2. T
3. F
4. F
5. F
6. T
7. F
8. T
9. T

**2.**

1. i
2. i
3. ii
4. i
5. iii

**3.**

1. true
2. false
3. true
4. true
5. true

**4.**

1. false
2. true
3. syntax error
4. false
5. false

**5.** 100 200 0

**6.**

if (code == ‘D’)

System.out.println(“Democrat”);

else if (code == ‘R’)

System.out.println(“Republican”);

else

System.out.println(“independent”);

**7.**

if (score >= 60)

System.out.println("You pass.");

else

System.out.println("You fail.");

**8.**

Because the first code uses “OR operator” || and therefore short-circuit evaluation is enforced so the evaluation of the statement (j++ == 7) is redundant and after omitting this statement, the value of j is unchanged (j == 0).

However, using “OR operator” |, results in the evaluation of both statements and therefore after evaluating the statement (j++ == 7), the value of j is 1. (j == 1);

**9.**

3 1

**10.**

2 2

**11.**

1 3

**12.**

If (sale > 20000)

bonus = 0.10;

else if (sale > 10000) && (sale <= 20000)

bonus = 0.05;

else

bonus = 0;

**13.**

If (overSpeed > 0) && (overSpeed <= 5)

fine = 20.00;

else if (overSpeed > 5) && (overSpeed <= 10)

fine = 75.00;

else if (overSpeed >10) && (overSpeed <= 15)

fine = 150.00;

else

fine = 150.00 + (overSpeed - 15) \* 20.00;

**14.**

1. If the score is equal to 95 then then statement after if evaluates to true which means the system will print “Discount = 10%” on the screen.
2. No output, since no action is defined for values of score less than 90.

**15.**

1. The output in (i) is “Grade is C.” and there will be no output in (ii) because (score = 70) is an assignment and it cannot be evaluated into a Boolean result;
2. In (i), no further action is taken since it is not defined in the if statement what to do if score is equal to 80 and the value of score remains unchanged after the if statement executes. In (ii), as long as an assignment is used after the “if” reserved word, a syntax error will not allow program execution and the value of score remains unchanged.

**16.**

1. z = (x >= y) ? x - y : y - x;
2. wages = (hours >= 40.0) ? 40 \* 7.50 + 1.5 \* 7.5 \* (hours - 40) : hours \* 7.50;
3. str = (score >= 60) ? “Pass” : “Fail”;

**17.**

1. If (x < 5)

y = 10;

else

y = 20;

1. If (fuel >= 10)

drive = 150;

else

drive = 30;

1. If (booksBought >= 3)

discount = 0.15;

else

discount = 0.0;

**18.**

1. $40.00
2. $40.00
3. $55.00

**19.**

* 1. The value of the statement (n <= 2) is Boolean and therefore cannot be used in a switch statement.
  2. We have a “duplicate case” which means there are two eventualities for one case and that is impossible.
  3. Valid.
  4. Valid.

**20.**

alpha == 15.

**21.**

beta == 7.

**22.**

a == 96.

**23.**

**import** java.util.\*;

**public** **class** E**rors**

{

**static** **Scanner** *console* = **new** Scanner(**System**.***in***);

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

{

**int** **a**, **b**, **c** = 0;

**boolean** **found**;

**System**.***out***.print("Enter the first integer: ");

a = *console*.nextInt();

**System**.***out***.println();

**System**.***out***.print("Enter the second integer: ");

b = *console*.nextInt();

**if** ((a > a \* b) && (10 < b))

found = 2 \* a > b;

**else**

{

found = 2 \* a < b;

**if** (found)

{

a = 3;

c = 15;

}

**if** (b == c)

{

b = 0;

a = 1;

}

}

**System**.***out***.println("a = " + a +"\nb = " + b

+ "\nc = " + c + "\nfound = " + found);

}

}

**24.**

**public** **class** Mystery{

**static** **final** **int** ***ONE*** = 5;

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

**int** **x**, **y**, **w**, **z**;

z = 9;

**if** (z > 10)

{

x = 12;

y = 5;

w = x + y + ***ONE***;

}

**else**

{

x = 12;

y = 4;

w = x + y + ***ONE***;

}

**System**.***out***.println("w = " + w);

}

}

**25.**

1. True
2. True
3. False
4. True

**26.**

import java.util.\*;

public class Exercise26 {

static Scanner console = new Scanner(System.in);

public static void main(String[] args) {

double firstNum, secondNum;

System.out.print("Enter two nonzero numbers: ");

firstNum = console.nextDouble();

secondNum = console.nextDouble();

System.out.println();

if (firstNum == 0)

{

System.out.println("Enter a nonzero number");

firstNum = console.nextDouble();

}

else if (secondNum == 0)

{

System.out.println("Enter a nonzero number");

secondNum = console.nextDouble();

}

if (firstNum > secondNum)

System.out.printf("first No / second No = %.2f",

firstNum / secondNum);

else if (firstNum < secondNum)

System.out.printf("second No / first No = %.2f",

secondNum / firstNum);

else

System.out.printf("product of the numbers = %.2f",

(firstNum \* secondNum));

}

}