COMP 248 - Tutorial #3 - Solution

Boolean expressions & selection instructions

Question 1: What output will be produced by the following code?

```
public class SelectionStatements
{
   public static void main(String[] args)
   {
     int number = 24;
     if(number % 2 == 0)
        System.out.print("The condition evaluated to true!");
     else
        System.out.print("The condition evaluated to false!");
      }
    }
```

Answer:

The condition evaluated to true!

Question 2: What would be the output of the code in #1 if number was originally initialized to 25?

Answer:

The condition evaluated to false!

Question 3: Write a multi-way if-else statement that evaluates a persons weight on the following criteria: A weight less than 116 pounds, output: Eat 5 banana splits! A weight between 116 pounds and 130 pounds, output: Eat a banana split! A weight between 131 pounds and 200 pounds, output: Perfect! A weight greater than 200 pounds, output: Plenty of banana splits have been consumed!

Answer:

```
import java.util.Scanner;
public class Question3 {
   public static void main(String[] args)
   {
      System.out.print("Please enter your weight:");
      //User input the weight
      Scanner keyboard = new Scanner(System.in);
      double weight;
      weight = keyboard.nextDouble();

      //The multi-way if-else statement
```

```
      if ((weight>=116)&&(weight<=130))
         System.out.println("Eat a banana split");
      else if (weight<116)
         System.out.println("Eat 5 banana splits!");
      else if ((weight<=200)&&(weight>=131))
         System.out.println("Perfect!");
      else if (weight>200)
         System.out.println("Plenty of banana splits have been consumed!");


      //The second solution
      /*
        if (weight<116)
          System.out.println("Eat 5 banana splits!");
        if ((weight>=116)&&(weight<=130))
          System.out.println("Eat a banana split");
        if ((weight<=200)&&(weight>=131))
          System.out.println("Perfect!");
        if (weight>200)
          System.out.println("Plenty of banana splits have been consumed!");
       */
   }
}
```

Question 4: Write an if-else statement to compute the amount of shipping due on an online sale. If the cost of the purchase is less than or equal to $20, the shipping cost is $5.99. If the cost of the purchase over $20 and at most $65, the shipping cost is $10.99. If the cost of the purchase is over $65, the shipping cost is $15.99.

Answer: The answer provides two ways to write if-else statement to solve this question.

```
import java.util.Scanner;
public class Question4 {
    public static void main(String[] args)

      System.out.print("Please enter the cost of the purchase:");
      //User input the cost of purchase
      Scanner keyboard = new Scanner(System.in);
      double cost_of_purchase;
      double shipping_cost = 0;
      cost_of_purchase = keyboard.nextDouble();
      /*
      if (cost_of_purchase<=20)
```

```
      shipping_cost=5.99;
   else
      if ((cost_of_purchase>20)&&(cost_of_purchase<=65))
        shipping_cost=10.99;
      else
        if (cost_of_purchase>65)
           shipping_cost=15.99;
    */
    if (cost_of_purchase<=20)
        shipping_cost=5.99;
    if ((cost_of_purchase>20)&&(cost_of_purchase<=65))
        shipping_cost=10.99;
    if (cost_of_purchase>65)
        shipping_cost=15.99;
    System.out.print("shipping cost is "+
   shipping_cost  );
  }
}
```

Question 5: What is the value of these expressions?

```
1+2 > 4-2 && 12 < 23    Answer: true
1+2 > 4-2 || 12 < 23    Answer: true
1+2 > 4-2 && 12 > 23    Answer: false
1+2 > 4-2 || 12 > 23    Answer: true
```

Question 6: What is the output of these code fragments?

```
int sum = 14;
if ( sum < 20 )
  System.out.print("Under ");
else
  System.out.print("Over  ");
System.out.println("the limit.");
```

Answer:
Under the limit.

```
int sum = 14;
if ( sum < 20 )
  System.out.print("Under ");
else
{
  System.out.print("Over  ");
  System.out.println("the limit.");
}
```

Answer:
Under

```
int sum = 94;
if ( sum < 20 )
{
  System.out.print("Under ");
  System.out.println("the limit.");
}
else
{
  System.out.print("Over  ");
  System.out.println("the limit.");
}
```

Answer:
Over the limit.

Question 7: Assume the following declarations:

```
int x = 1;
boolean isFree = false;
char initial = 'L';
char code = 'Y';
String english = "hi";
String italian = "ciao";
boolean q = (5 == 6);
```

For each of the following expressions, indicate if it creates a syntax error or not. If there is no error, indicate the value of the expression.

```
(true && (5>6))
```

Answer: Expression value is *false*

```
((x!=0) || (x%2 == 1))
```

Answer: Expression value is *true*

```
(isFree | (x<0))
```

Answer: Expression value is *false*

```
initial == code
```

Answer: Expression value is *false*

```
!!q
```

Answer: Expression value is *false*

```
(0 <= x <= 10)
```

Answer: Syntax error. It should be ((x<=10)&&(x>=0)), and the value is *true*

```
(english > italian)
```

Answer: Syntax error.

```
(isFree) ? 4 : 10
```

Answer: Expression value is 10

```
initial = code
```

Answer: Expression value is 'Y' and after this statement, the value of "initial" will be changed to 'Y' (the value of "code")

```
"italian".equals(italian)
```

Answer: Expression value is *false*

Question 8: What is the output of the following?

```
int x = -555;
boolean isNegative = (x < 0);
if (isNegative)
{
   x = 100;
   if (isNegative)
      System.out.println("no");
   else
      System.out.println("yes");
}
else
   System.out.println("maybe");
```

Answer:
no

```
rebate = 15;
```