Tutorial #5: Nested selection/Switch - SOLUTIONS

Question 1:

Write a multi-way if-else statement that evaluates a person's 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 Question1 {
  public static void main(String[] args)
  {
     //Declare variables
     Scanner keyboard = new Scanner(System.in);
     double weight;

     //Prompt for and read the weight
     System.out.print("Please enter your weight:");
     weight = keyboard.nextDouble();

     //The multi-way if-else statement
     if (weight < 116)
        System.out.println("Eat 5 banana splits!");
     else if (weight <= 130)
        System.out.println("Eat a banana split");
     else if (weight <= 200)
        System.out.println("Perfect!");
     else
        System.out.println("Plenty of banana splits have been consumed!");

  }
}
```

Question 2:

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:

```
import java.util.Scanner;
public class Question2 {
  public static void main(String[] args)
  {
      // Variable declarations
      Scanner keyboard = new Scanner(System.in);
      double cost_of_purchase;
      double shipping_cost = 0;

      //Prompt for and read the cost of purchase
      System.out.print("Please enter the cost of the purchase:");
      cost_of_purchase = keyboard.nextDouble();

      if (cost_of_purchase <= 20)
         shipping_cost = 5.99;
      else
         if (cost_of_purchase <= 65)
           shipping_cost = 10.99;
         else
           shipping_cost = 15.99;
  }
}
```

Question 3: Console Input/Output

Assume the following fragment of code:

```
Scanner myKeyboard = new Scanner(System.in);
String msg = myKeyboard.next();

int x = 0; int y = 10; int z = 100;

switch(msg.charAt(0))
{
   case 'a':
   case 'b': System.out.println("case 1");
        x = (msg.equals("abc") ? (5 + y++) : (--y + z--));
        break;
   case 'c': System.out.println("case 2");
        y /= 5; default:
        System.out.println("default");
}
System.out.println(x + " " + y + " " + z);
```

a) What is the output if the user enters the string: `abc`

Answer:
```
case 1
15 11 100
```

b) What is the output if the user enters the string: `aBC`

Answer:
```
case 1
109 9 99
```

c) What is the output if the user enters the string: `ccc`

Answer:
```
case 2
default
0 2 100
```

Question 4:

Assume the following fragment of code:

```
int age;
double rebate = 0;
boolean isAStudent;
int workExperience;

…

if (age < 10)
   rebate = 20;
if (age > 70)
    rebate = 20;
if (age < 20)
   if (isAStudent)
      if (workExperience > 4)
         rebate = 15;
```

Rewrite the instructions outlined in grey by reducing the number of `if` statements **to a minimum**.

Your new code should behave exactly as the above code in every possible situation.

Answer:

```
if (age < 10 || age > 70)
      rebate = 20;
if (age < 20 && isAStudent && workExperience > 4)
      rebate = 15
```