1.  (10 Points) Valid or Invalid syntax?

| | | |
|---|---|---|
| a. `int numBooks = 3;`<br>`   int numNotebooks = 2;`<br>`   numBooks += numNotebooks;` | **Valid** | **Invalid** |
| b. `System.out.print("Dog count = ", numDogs);` | **Valid** | **Invalid** |
| c. `int __numCars = 5;` | **Valid** | **Invalid** |
| d. `String s1 = "Hello";`<br>`   String s2 = "Goodbye";`<br>`   s1 = s1 + " " + s2;` | **Valid** | **Invalid** |
| e. `if (5 < a < 9) {`<br>`        a = a * 5;`<br>`   } else {`<br>`        a = a * 6;`<br>`   }` | **Valid** | **Invalid** |

Total of  115 Points
Version 1

2.  (20 Points) During text messaging, people use abbreviations to save on typing. Expand the program
below to recognize and translate the following abbreviations:

- LOL – Laughing Out Loud
- TMI – Too Much Information
- SMH – Shaking My Head

If the abbreviation is not included in the list, your program should output "Unknown Abbreviation"
for the translation. **The input should be case insensitive** and the output should be as shown above.

```java
import java.util.Scanner;

public class SMSAbbreviations1 {

    public static void main(String[] args) {
        Scanner scnr = new Scanner(System.in);

        System.out.println("Enter The SMS Abbreviation: ");
        String abbreviation = scnr.nextLine();

        String translation = "";

        /* Your solution goes here */



        System.out.println(abbreviation + " means " + translation);

        return;
    }
}
```

3. (10 Points) Write the Java statements to compute $x = \frac{-b-\sqrt{b^2-4ac}}{2a}$. You can assume that x, a, b and c are all **double** values. You must use Math operations where possible.

4. (5 Points) Convert the binary number 01011010 to a decimal number.

5.  (10 Points) Given the following code:

```java
import java.util.Scanner;

public class Switch1 {
    public static void main(String[] args) {
        Scanner scnr = new Scanner(System.in);
        System.out.println("Enter A Number From 1..6: ");
        int num = scnr.nextInt();

        switch (num) {
            case 1:
                System.out.println("One");
                break;
            case 2:
                System.out.println("Two");
            case 3:
                System.out.println("Three");
            case 4:
                System.out.println("Four");
                break;
            case 5:
                System.out.println("Five");
            case 6:
                System.out.println("Six");
                break;
            default:
                System.out.println("Invalid Number");
        }
    }
}
```

a.  What is printed when the user enters 1?

d.  What is printed when the user enters 6?

b.  What is printed when the user enters 3?

e.  What is printed when the user enters 8?

c.  What is printed when the user enters 5?

Total of  115 Points
Version 1

6.  (15 Points) Given the following string definition:

```
String str = "Java Programming Is Fun!";
```

a.  Write the Java statement that would return the length of str.

b.  What is the length of str?

c.  Write the Java statement to find the index of the substring **"Is"**:

d.  What is the index of the substring **"Fun"**?

e.  What does the Java statement str.substring(5, 16) return?

f.  What is the Java statement to change the word **"Fun"** to the word **"Incredible"**:

g.  Write the Java statement to append the string **" All the time!!!"**

7.  (20 Points) Write a **complete** Java program that prompts the user for *yearNumber*.  Your program will then print out one of the following messages:

  - *yearNumber* is a leap year
  - *yearNumber* is not a leap year

8.  (25 Points) Write a **complete** Java program that prompts the user for *monthNumber*  (where 1 =
    January, 2 = February, … , 12 = December) and *date*  (a number from 1 .. 31). Your program
    will then print out one of the following messages:

    - Error: *monthNumber*  is not a valid month
    - Error: *date*  is not a valid date
    - Error: *monthNumber*  does not have *date* days
    - *monthNumber date*  is monthName *date*.

    You can assume that February only has 28 days.

1.  (10 Points) Valid or invalid syntax?

| | | |
|---|---|---|
| a. `int numBooks = 3;`<br>   `int numNotebooks = 2;`<br>   `numBooks =+ numNotebooks;` | **Valid** | **Invalid** |
| b. `system.out.print("Dog count = " + numDogs);` | **Valid** | **Invalid** |
| c. `int 3rdPlace = 6;` | **Valid** | **Invalid** |
| d. `String s1 = "Hello";`<br>   `String s2 = "Goodbye";`<br>   `s1 = s1.concat(s1);` | **Valid** | **Invalid** |
| e. `if ((a > 5) && (a < 9))`<br>     `a = a * 7;`<br>   `else`<br>     `a = a * 3;` | **Valid** | **Invalid** |

2.  (20 Points) During text messaging, people use abbreviations to save on typing. Expand the program
    below to recognize and translate the following abbreviations:

- BFF — Best Friend Forever
- IMHO — In My Humble Opinion
- 2QT — Too Cute

If the abbreviation is not included in the list, your program should output "Unknown Abbreviation"
for the translation. **The input should be case insensitive** and the output should be as shown above.

```java
import java.util.Scanner;

public class SMSAbbreviations2 {

   public static void main(String[] args) {
         Scanner scnr = new Scanner(System.in);

         System.out.println("Enter The SMS Abbreviation: ");
         String abbreviation = scnr.nextLine();

         String translation = "";

         /* Your solution goes here */



         System.out.println(abbreviation + " means " + translation);

         return;
   }
}
```

3. (10 Points) Write the Java statements to compute $x = \frac{-c-\sqrt{a^3-5bc}}{4b}$. You can assume that x, a, b and c are all **double** values. You must use Math operations where possible.

4. (5 Points) Convert the binary number 11001101 to a decimal number.

5.  (10 Points) Given the following code:

```java
import java.util.Scanner;

public class Switch2 {
    public static void main(String[] args) {
        Scanner scnr = new Scanner(System.in);
        System.out.println("Enter A Number From 1..6: ");
        int num = scnr.nextInt();

        switch (num) {
            case 1:
                System.out.println("One");
            case 2:
                System.out.println("Two");
                break;
            case 3:
                System.out.println("Three");
            case 4:
                System.out.println("Four");
                break;
            case 5:
                System.out.println("Five");
            case 6:
                System.out.println("Six");
                break;
            default:
                System.out.println("Invalid Number");
        }
    }
}
```

a.  What is printed when the user enters 1?

d.  What is printed when the user enters 5?

b.  What is printed when the user enters 3?

e.  What is printed when the user enters 7?

c.  What is printed when the user enters 4?

6.  (15 Points) Given the following string definition:

        `String str = "CMP-167 Is The Best Class!";`

   a.  Write the Java statement that would return the length of str.

   b.  What is the length of str?

   c.  Write the Java statement to find the index of the substring **"Best"**:

   d.  What is the index of the substring **"Class"**?

   e.  What does the Java statement `str.substring(15, 25)` return?

   f.  What is the Java statement to change the word **"Best"** to the word **"Most Amazing"**:

   g.  Write the Java statement to append the string `" Ever!!!"`

7.  (20 Points) Write a **complete** Java program that prompts the user for *yearNumber*.  Your
    program will then print out one of the following messages:

    - *yearNumber* is a leap year
    - *yearNumber* is not a leap year

8.  (25 Points) Write a **complete** Java program that prompts the user for *monthNumber*  (where 1 = January, 2 = February, ... , 12 = December) and *date*  (a number from 1 .. 31). Your program will then print out one of the following messages:

- Error: *monthNumber*  is not a valid month
- Error: *date*  is not a valid date
- Error: *monthNumber*  does not have *date* days
- *monthNumber date*  is monthName *date*.

You can assume that February only has 28 days.

1.  (10 Points) Valid or invalid syntax?

| | |
|---|---|
| a. `int numBooks = 3;`<br>`   int numNotebooks = 2;`<br>`   numBooks -= numNotebooks;` | **Valid**          **Invalid** |
| b. `System.out.print("Dog count = " numDogs);` | **Valid**          **Invalid** |
| c. `int very short = 6;` | **Valid**          **Invalid** |
| d. `String s1 = "Hello";`<br>`   String s2 = "Goodbye";`<br>`   boolean b = s1 > s2;` | **Valid**          **Invalid** |
| e. `if ((a => 5) && (a =< 9))`<br>`       a = a * 7;`<br>`   else`<br>`       a = a * 3;` | **Valid**          **Invalid** |

2. (20 Points) During text messaging, people use abbreviations to save on typing. Expand the program below to recognize and translate the following abbreviations:

- AAS — Alive And Smiling
- AYK — As You Know
- BAU — Business As Usual

If the abbreviation is not included in the list, your program should output "Unknown Abbreviation" for the translation. **The input should be case insensitive** and the output should be as shown above.

```java
import java.util.Scanner;

public class SMSAbbreviations3 {

    public static void main(String[] args) {
        Scanner scnr = new Scanner(System.in);

        System.out.println("Enter The SMS Abbreviation: ");
        String abbreviation = scnr.nextLine();

        String translation = "";

        /* Your solution goes here */


        System.out.println(abbreviation + " means " + translation);

        return;
    }
}
```

3. (10 Points) Write the Java statements to compute $x = \frac{-b+\sqrt{b^3-4ac}}{2a}$. You can assume that x, y and z are all **double** values. You must use Math operations where possible.

4. (5 Points) Convert the binary number 01110110 to a decimal number.

5.  10 Points) Given the following code:

```java
import java.util.Scanner;

public class Switch3 {
    public static void main(String[] args) {
        Scanner scnr = new Scanner(System.in);
        System.out.println("Enter A Number From 1..6: ");
        int num = scnr.nextInt();

        switch (num) {
            case 1:
                System.out.println("One");
                break;
            case 2:
                System.out.println("Two");
            case 3:
                System.out.println("Three");
                break;
            case 4:
                System.out.println("Four");
            case 5:
                System.out.println("Five");
                break;
            case 6:
                System.out.println("Six");
            default:
                System.out.println("Invalid Number");
        }
    }
}
```

a.  What is printed when the user enters 1?

d.  What is printed when the user enters 6?

b.  What is printed when the user enters 2?

e.  What is printed when the user enters 9?

c.  What is printed when the user enters 4?

6.  (15 Points) Given the following string definition:

```
String str = "Peace And Education For All!";
```

a.  Write the Java statement that would return the length of str.

b.  What is the length of str?

c.  Write the Java statement to find the index of the substring **"Education"**:

d.  What is the index of the substring **"For"**?

e.  What does the Java statement `str.substring(10, 19)` return?

f.  What is the Java statement to change the word " And " to the word ", Justice And ":

g.  Write the Java statement to append the string " Now!!!"

7.  (20 Points) Write a **complete** Java program that prompts the user for *yearNumber*.  Your
    program will then print out one of the following messages:

    - *yearNumber* is a leap year
    - *yearNumber* is not a leap year

8. (25 Points) Write a **complete** Java program that prompts the user for *monthNumber* (where 1 = January, 2 = February, … , 12 = December) and *date* (a number from 1 .. 31). Your program will then print out one of the following messages:

- Error: *monthNumber* is not a valid month
- Error: *date* is not a valid date
- Error: *monthNumber* does not have *date* days
- *monthNumber date* is monthName *date*.

You can assume that February only has 28 days.

1.  (10 Points) Valid or invalid syntax?

| | |
|---|---|
| a. `int numBooks = 3;`<br>   `int numNotebooks = 2;`<br>   `numBooks =- numNotebooks;` | **Valid**          **Invalid** |
| b. `System.out.print("Dog count = " + numDogs);` | **Valid**          **Invalid** |
| c. `int veryTall! = 7;` | **Valid**          **Invalid** |
| d. `String s1 = "Hello";`<br>   `String s2 = "Goodbye";`<br>   `int i = s1.poaitionOf('H');` | **Valid**          **Invalid** |
| e. `if ((a >= 5) || (a <= 9))`<br>     `a = a * 7;`<br>  `else`<br>     `a = a * 3;` | **Valid**          **Invalid** |

2. (20 Points) During text messaging, people use abbreviations to save on typing. Expand the program below to recognize and translate the following abbreviations:

- BRB — Be Right Back
- IDST — I Did Not Say That
- NMP — Not My Problem

If the abbreviation is not included in the list, your program should output "Unknown Abbreviation" for the translation. **The input should be case insensitive** and the output should be as shown above.

```java
import java.util.Scanner;

public class SMSAbbreviations4 {

    public static void main(String[] args) {
        Scanner scnr = new Scanner(System.in);

        System.out.println("Enter The SMS Abbreviation: ");
        String abbreviation = scnr.nextLine();

        String translation = "";

        /* Your solution goes here */

        System.out.println(abbreviation + " means " + translation);

        return;
    }
}
```

3. (10 Points) Write the Java statements to compute $x = \frac{-a - \sqrt{c^3 - 7ab}}{4c}$. You can assume that x, a, b and c are all **double** values. You must use Math operations where possible.

4. (5 Points) Convert the binary number 01101110 to a decimal number.

5.  (10 Points) Given the following code:

```java
import java.util.Scanner;

public class Switch4 {
   public static void main(String[] args) {
        Scanner scnr = new Scanner(System.in);
        System.out.println("Enter A Number From 1..6: ");
        int num = scnr.nextInt();

        switch (num) {
            case 1:
                System.out.println("One");
            case 2:
                System.out.println("Two");
                break;
            case 3:
                System.out.println("Three");
            case 4:
                System.out.println("Four");
                break;
            case 5:
                System.out.println("Five");
            case 6:
                System.out.println("Six");
            default:
                System.out.println("Invalid Number");
        }
    }
}
```

a.  What is printed when the user enters 1?

d.  What is printed when the user enters 5?

b.  What is printed when the user enters 2?

e.  What is printed when the user enters 8?

c.  What is printed when the user enters 3?

6.  (15 Points) Given the following string definition:

```
String str = "Cold Weather Is Terrible!";
```

a.  Write the Java statement that would return the length of str.

b.  What is the length of str?

c.  Write the Java statement to find the index of the substring **"Is"**:

d.  What is the index of the substring **"Terrible"**?

e.  What does the Java statement `str.substring(5, 15)` return?

f.  What is the Java statement to change the word **"Terrible"** to the word **"The Worst"**:

g.  Write the Java statement to append the string **" Especially In Winter!!!"**

7. (20 Points) Write a **complete** Java program that prompts the user for *yearNumber*. Your program will then print out one of the following messages:

- *yearNumber* is a leap year
- *yearNumber* is not a leap year

8.  (25 Points) Write a **complete** Java program that prompts the user for *monthNumber*  (where 1 = January, 2 = February, ... , 12 = December) and *date*  (a number from 1 .. 31). Your program will then print out one of the following messages:

- Error: *monthNumber*  is not a valid month
- Error: *date*  is not a valid date
- Error: *monthNumber*  does not have *date* days
- *monthNumber date*  is monthName *date*.

You can assume that February only has 28 days.