Part I — Questions

1. Write a statement that creates a 10-elements \texttt{int} array named \texttt{numbers}.

\textbf{Solution.}

\begin{verbatim}
int[] numbers = new int[10];
\end{verbatim}

2. In the following, what is the value of the size declarator? What is the value of the index?

\begin{verbatim}
int[] numbers;
numbers = new int[8];
numbers[4] = 9;
\end{verbatim}

\textbf{Solution.} The size declarator is 8, the subscript, or index, is 4.

3. What is wrong with the following array declaration?

\begin{verbatim}
int[] books = new int[-1];
\end{verbatim}

\textbf{Solution.} The size declarator cannot be negative.

4. Draw the content of the \texttt{scores} array once those statements have been executed.

\begin{verbatim}
int[] scores = new int[3];
scores[0] = 13;
scores[2] = 25;
\end{verbatim}

\begin{center}
\begin{tabular}{|c|c|c|}
\hline
& & \\
\hline
scores[0] & 13 & 0 & 25 \\
\hline
\end{tabular}
\end{center}

\textbf{Solution.}

5. What will be displayed at the screen by the following program?

\begin{verbatim}
for (int num = 3 ; num <= 5 ; num++)
Console.Write(num + " ");
\end{verbatim}

\textbf{Solution.}

3 4 5

6. Write a \texttt{for} loop that display at the screen the sequence “1, 2, 3, 4, 5, 6, 7, 8, 9, 10, ”.
Solution.

```c
for (int x = 1 ; x <= 10 ; x++)
    Console.Write(x + " ");
```

7. Adapt the code from Exercise 6 so that the same sequence will be displayed at the screen, but without the last comma.

Solution.

```c
for (int x = 1 ; x <= 10 ; x++)
{
    Console.Write(x);
    if (x < 10) Console.Write(", ");
}
```

8. Write a for loop that display at the screen the sequence "1 3 5 7 9 ."

Solution.

```c
for (int x = 1 ; x <= 10 ; x+= 2)
    Console.Write(x + " ");
```

9. Consider the following code:

```c
for (int y = 1; y <= 3; y++)
{
    for (int z = 1; z < 5; z++)
        Console.WriteLine("Scene "+ y + ", take "+ z + ". ");
    Console.WriteLine();
}
```

How many times does the outer loop iterates (i.e., how many scenes are shot)? How many times does the inner loop iterates (i.e., how many takes for each scene)? Finally, what is the total number of iteration of the nested loops (i.e., how many takes are made, total)?

Solution. 3, 4, 12.

10. Circle the pretest loops:

    do while switch while for if-else-if

Solution. for and while are pretest loops.

11. What will be displayed at the screen by the following code?

```c
int[] values = new int[6];
for (int i = 0 ; i < 6 ; i++)
    values[i] = (i*2);

foreach (int j in values)
    Console.WriteLine(j);
```
12. Suppose we are given an `int` array `dailyPushUp` with 7 elements. Write a piece of code that displays the value of the elements stored in the array `dailyPushUp`.

Solution.

```csharp
for (int j = 0; j < 7; j++)
    Console.WriteLine(dailyPushUp[j]);
```

13. What is “array bounds checking”? When does it happen?

Solution. C# making sure that you’re not using a subscript outside the allowed range. It happens at run time.

14. Is there an error with the following code? If you think there is one, explain it, otherwise draw the content of the `myIncomes` array once those statements have been executed.

```csharp
double[] myIncomes = new double[5];
myIncomes[1] = 3.5;
// No income on day two.
myIncomes[3] = 5.8;
myIncomes[4] = 0.5;
myIncomes[5] = 1.5;
```

Solution. The subscripts are off, they should go from 0 to 4.

15. What would be the size of the `test` array after the following statement has been executed?

```csharp
int[] test = {3, 5, 7, 0, 9};
```

Solution. 5

16. Write a statement that creates and initializes a `double` array with the values 12.5, 89.0 and 3.24.

Solution.

```csharp
double[] question = {12.5, 89.0, 3.24};
```

17. What is the value of `count` and the content of `number` once the following has been executed?

```csharp
int count=2;
int[] number={3, 5, 7};
number[count--] = 8;
number[count]--;
```
Solution. count is 1. numbers is 3, 4, 8.

18. Suppose we have an array named temp that has been declared and initialized. How can we know the number of elements in this array?

Solution. By using the Length field: temp.Length.

19. Describe what the following code would do.

```csharp
int[] record = { 3, 8, 11 };
int accumulator = 0;
foreach (int i in record)
    accumulator += i;
```

Solution. Declare and initialize an int array with the values 3, 8 and 11, and then sum those values in an accumulator variable.

20. Assuming we have two int arrays of the same size, firstA and secondA, write a program that copy the content of firstA into secondA.

Solution.

```csharp
for (int k = 0; k < firstA.Length; k++)
    secondA[k] = firstA[k];
```

21. Write a static method (header included) that takes as argument an int array, and display at the screen the value of each element of that array.

Solution.

```csharp
public static void p(int[] a)
{
    foreach (int k in a) Console.WriteLine(k);
}
```

22. Write a static method (header included) that takes as argument an int array, and stores the value 10 in each element of that array.

Solution.

```csharp
public static void z(int[] a)
{
    for (int j = 0; j < a.length; j++) a[j] = 10;
}
```