Computer Sciences **—** xx/xx/2019 **— Duration: 2h**

StudentID		**Teacher**		**X**
Surname		**Name**		**0**

Question 1	**RESULT**
Calculate the sum of these two binary numbers on 4 bits or report the overflow condition $\qquad$ 0100 + 0101 Assume that their format is: a. Pure binary b. 2's complement c. Sign and magnitude	a. b. c.
Most relevant steps 	

Question 2
What type of information is transferred on the different buses when the CPU reads an information from the memory? Give an example.

Question 2	**RESULT**
Sort from low to high the following numbers. 0 x F F F F F F F F 0 x 0 0 0 0 0 0 0 0 0 x 1 2 3 4 5 6 7 8 0 x 8 7 6 5 4 3 2 1 Numbers are in 2's complement on 32 bits, and they are displayed using the hexadecimal notation.	
Most relevant steps 	

Question 4 — Programming

Repeatedly find and remove known patterns from a sequence.
- The sequence of characters is specified in a file those name is given as first argument on the command line. The file of contains a list of ASCII characters, one character each line. The number of characters is not known, but it is less than the constant MAX_SEQ_LEN specified through a #define directive.
- The patterns are specified in a second file those name is given as second argument on the command line. The number of patterns is not known, but it is less than the constant MAX_PATTERN_NUM specified through a #define directive; patterns are shorter than the sequence.
- The program must examine the sequence, looking for the given patterns. Patterns must be searched in the order they are specified in the second file. As soon a pattern is detected, it must be *removed* from the sequence and the whole process restarted; that is, the new sequence examined from the beginning, looking for the first pattern. The process is iterated until a pattern is present.
- The program must display the sequence as it was read from the file, and after removing each pattern.

For example, if the content of the file with the sequence is

```
*
X
A
A
B
B
A
A
A
A
A
A
A
A
Y
Z
*
```

And the content of the file containing the patterns is

```
AAA
AABBAA
XYZ
```

The program would provide as output (the pattern that can be identified in the next step is highlighted in yellow)

```
*XAABBAAAAAAAYZ*
*XAAAAAAYZ*
*XAAAYZ*
*XYZ*
**
```