# Series exercises No. 01

Exercise 1 :

1. Write and represent the logical expressions ($\bar{A}$, $A.\,B$, $A + B$) using only the expression corresponding to the logic gate:

   A. "NAND" only.

   B. "NOR" only.

2. Using the gate "**AND**", write and represent the next formula: $A.\left(\overline{B+\bar{C}}\right)$.

Exercise 2 :

Simplify the following logic circuit who used the logic "Exclusive Not-Or" gate ($\overline{A \oplus B} = A \odot B$) of manner that the result contains one and only one "Exclusive Not-Or" gate.
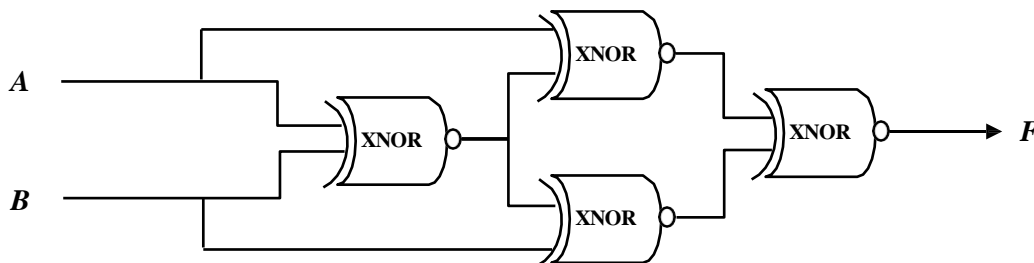
Exercise 3:

Let be three switches which control the operation of two lamps according to the following conditions:

1. The first lamp works only if at least one switch is closed.
2. The second lamp only works if at least two switches are closed.

Questions :

A. Find the expressions of the logic functions and create the corresponding combinatorial logic circuit.

B. Write the expressions of the logic functions found in question (**A.)** using the logic expression corresponding to the "**NAND**" logic gate only, and then represent the corresponding flowchart.

C. Write the expressions for the logic functions found in question (**A.)** using the logic expression corresponding to the "**NOR**" logic gate only, then represent the corresponding flowchart.