BIM203 LOGIC DESIGN - HOMEWORK 1

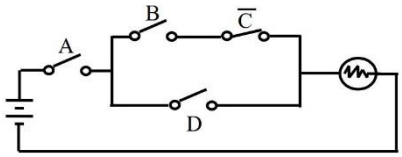
1) Do the following conversions/codings:

a) Convert 1101.40625_{10} to binary

b) Convert 999_{10} to octal

c) Convert 723_8 to hexadecimal

d) Encode 2022_{10} using BCD



2) Light is on (L = 1) for L (A, B, C, D) and off (L = 0), otherwise. Considering the above electronic circuit;

a) Draw the truth table and logic diagram.

b**)** Compute the costs L, G, and GN.

3) Prove the identity of each of the following Boolean equations using algebraic manipulations. Please also specify which theorems you used.

a) A'B'+A'B+AB'=A'+B'

b) X'Y+Y'Z'+XY+Y'Z=1

c) X+XY+X'Z+YZ'=X+Y+Z

d) A'B+AC'+ABC=B+AC'

4)

G (A, B, C, D) =$\sum m$ (1,4,6,7,8,9,12,13,14,15)

G (A, B, C, D) =$\sum m$ (0,2,4,5,6,10,13) + $\sum d$ (1,7,8)

For each binary expression above;

a) Find the simplest expression using K-map.

b) Draw the simplified circuit in Logisim.

NOTES

- **Each group (consisting of max. 2 students) should make single submission.**
- **Indicate IDs and names of the group members within the report.**
- **You cannot change your group in the upcoming assignments.**
- **For your report, you can use a text processor software like MS Word.**
- **Submit your work before the deadline.**