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DEPARTEMENT DE GENIE ELECTRIQUE
2ème année Licence ELT, ELM

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TD Series Nº. 1 Combinatorial and Sequential Logic

Exercise 1

Find the decimal equivalents of the highest numbers that can be written with five positions in the base systems: 10, 8, 5 and 2.

Exercise 2

Convert the following numbers:

- $(EF4)_{16}$ to octal.
- $(3123)_4$ to hexadecimal.
- $(4341)_5$ to base 9.

Exercise 3

1- Convert the following decimal fractional numbers to binary: (0.125), (0.372).

2- Convert the following mixed numbers:

- $(32.65)_{10}$ to binary.
- $(31.23)_4$ to decimal.

Exercise 4

Convert to base 8 the decimal numbers 607 and 0.426 with an error $\varepsilon<8^{-3}$ using the method of successive subtractions then verify the result using the method of successive divisions and multiplications.

Exercise 5

1- Convert the following decimal numbers to BCD8421:

a- 342 b- 679.8 c- 500.6

2- Convert the following BCD8421 numbers to decimal:

a- 10010000 b- 100110111001 c- 0111.0011

3- Convert the following binary numbers to BCD8421:

a- 10100 b- 11011.1

4- Convert the following binary numbers to Gray:

a- 0110 b- 10100 c-10101

5- Convert the following Gray numbers to binary:

a- 0001 b- 11100 c-10100

Exercise 6

1- Using the table below and the ASCII code, decode (decipher) the following message, written in binary:

1001100	1100001	0100000	1101101	1100101	1110011	1110101
1110010	1100101	0100000	1100101	1110011	1110100	0100000
1101100	0100111	1101111	1100011	1110100	1100101	1110100

2- If we store the previous message in memory arranged in bytes: how many bytes will be used?

Exercise 7

Find the appropriate base(s) for each of the following operations:

a- 23 + 44 + 14 + 32 = 223

b- $\sqrt{41} = 5$

c- 10 + 10 = 20