

PW 3 : Storage units and Numeral systems

Exercise 1 :

- Determine the capacity of RAM memory (**in MB**) installed on a computer (PC)
- Determine the size of the hard disk drive (**in GB**) installed on a computer
- Determine the used and the available space of the hard disk drive (in **GB**)

Exercise 2 :

1. Achieve the following conversions:

- 64 bytes =bits
- 2 Terabyte =Gigabit =..... Megabyte
- 4,7 Gbyte = Mbyte = Kbyte =bytes
- 512 Kbit/s = Kbyte/s =bytes/s.
- 2,4 GHz = MHz =..... Hz

2. What is the necessary time to download a file of **1 Megabyte** using a network of **1Mbit/s** ?

3. We want to store a text of 8 lines in the memory of a computer, knowing that each line consists of 80 characters, and each character is coded on one byte.

a) Give the minimum size to store this text in bits?

b) Give the size in KB ?

4. Arrange the following storage media in ascending order:

1) DVD 1.7 GB 2) Flash disk 256 MB 3) CD-ROM 700 MB 4) hard disk 80 GB

4. A hard drive with a size of **40 GB** (Gigabytes) contains **10 GB** of data. Its owner wants to burn its contents on to CD-ROMs with a capacity of **700 MB** (Megabytes) each.

How many **CD-ROMs** does the owner need to be able to carry out this operation?

Exercise 3:

1. How many bytes are 32 bits?
2. To store numbers from 0 to 20 how many bits do we need?
3. How many values can we represent using 1 Byte, and in 10 bits?

Exercise 4:

1. Convert the following numbers to base 10:
 $(562)_8$, $(110111)_2$, $(3EB8)_{16}$, $(3213.13)_4$, $(1101.1101)_2$
2. Convert the decimal number $X= 327$ to base 2, 7, 8, and 16.
3. Convert the decimal numbers $X=54.8125$ and $Y=15.210$ to binary system.
4. Consider the number $Y = (11010110101)_2$, Convert the number Y directly to base 4, 8, 16 without passing by the base 10.
5. Convert directly to base 2 (do not use the division procedure) the numbers:
 $X = (1323)_4$, $Y= (3765)_8$, $Z= (AB1F9)_{16}$.

Exercise 5: Carry the following transformations:

- 1- $(2019)_{10} = (?)_2$; $(269)_{10} = (?)_2$;
- 2- $(1011001111101)_2 = (?)_8 = (?)_{10} = (?)_{16}$
- 3- $A= (2AE62)_{16} = (?)_8$; $B=(6571)_8 = (?)_{16}$
- 4- Realize the following operation $A+B$, in base 16, in base 8 and in base 2 ?