# REVISIONS LOGIC - PROBLEM SOLVING

**EXERCICE 1 : Conversion**

**Q1.** 8610 🡪 base 7

Explanation : device 86 by 7

86 7

2 12 7

5 1

Result : 152

**Q2.** 5CE16 🡪 base 10

Explanation : convert base 16 to base 2 and then convert base 2 to base 10

5CF(16) = 10111001110(2) = 1486(10)

Result : 1486

**EXERCICE 2 : Hexadecimal operation**

**Q1.** Use **2 methods** to do this operation

D45

+ 8A5

+ 1C0

Method 1 : Method 2 :

Convert all base 16 to base 2 and then operation convert all base 16 to base 10 and then operation base

Base 2,when we recieved answer, base 10. when we recieved answer, we convert base 10 of

we convert base 2 of the answer to base 16. The answer to base 16.

D45 110101001001 D45

+8A5 = + 100010100101 +8A5 =

+1C0 +000111000000 +1C0

17AA 1011110101110 = 17AA

**EXERCICE 3 : Logic**

The alphabet is given below to help you:

a b c d e f g h i j k l m n o p q r s t u v w x y z

Find the missing letter in every series below:

**Q1.** c c d \_e\_ e f g g h

**Q2.** f g e h d i c \_j\_

**EXERCICE 4 : Bits, bytes and storage**

**Q1.** I have 230 colors to store. How many bits do I need? How many bytes do I need? **Justify**

We know 1 color = 24 bits =>230 color = 24\*230bits = 5520 bits = 5520/8 byte = 690 bytes

**Q2.** If I have 10 bits, how many colors can I store? **Justify**

If you have 10 bits, color that you can store is

**Q3.** For the RGB, we use 6 bytes. How many colors can we express? Explain the method but we don’t need the result.

**EXERCICE 5 : Encoding problem**

**Q1.**

Rules:

* 4 letters: A, E, O, U
* Each letter is repeated minimum 0 time and maximum 7 times.
* The letters are always in the alphabetic order: A then E then O then U

Examples:

AAAAEEEOOU

EEEUUUUUUU

AAEEOOUU

1. Find an encoding of maximum **12 bits**. Explain the method, explain the size and give examples.
2. Is your encoding lossless or loosely?

**Q2.**

Now, the letters can be in any order

Example:

EEEOOAAAAU

UUEEEOAA

1. Does the encoding you found before work for this new rule?
2. Find a new lossless encoding. What is the minimum size of this encoding? Explain and give example**s**.
3. For this example **EEEEEE**, what is the most little size possible with your encoding?
4. Is this encoding a compression ?